Musamus Journal of Physical Education and Sport (MJPES)
http://ejournal.unmus.ac.id/index.php/physical
Volume 7, No. 4, October 2025, Pg.1-16
DOI: 10.35724/mjpes.v1i4.7244

The relationship of some forms of motor coordination to the accuracy of serving and hitting high aces in youth volleyball

Ahmed Hassan Saber Al Kaabi

Ministry of Education - Open Educational College 2025

Ahmedhasan19650@gmail.com

Abstract:

Introduction: A volleyball player must possess the ability of motor coordination in order to help move quickly and powerfully on the court while executing the skill of serving and hitting aces. The researcher observed that there is a clear weakness in the level of accuracy of the technical performance of the two offensive skills by most of the players of the participating teams. The aim of the research is to identify the relationship between some forms of motor coordination and the accuracy of the performance of serving and hitting high aces in youth volleyball. Research hypotheses: There is a statistically significant correlation between some forms of motor coordination and the accuracy of the performance of the skills of serving and hitting high aces in youth volleyball. Research methodology and field procedures: The researcher used the descriptive method with a correlational approach. The research community is represented by the players of Qatar's youth volleyball clubs, and the research sample is the players of Naft Maysan youth volleyball club and their number (12) players who participated in the game league for the season (2024). Conclusions The results showed that there is a statistically significant correlation between motor coordination (strength characterized by speed, flexibility and motor coordination) and the accuracy of the performance of the skill of high aces among youth volleyball players. Recommendations Emphasize the importance of developing the ability of motor coordination in the stages of preparation in general and the youth category in particular, due to its importance in the accuracy of performing the skills of serving and hitting high aces in youth volleyball.

Keywords: Motor coordination . Accuracy of the skill of the crushing blow . Youth Volleyball .

1.1 Introduction and importance of the research: The motor ability is acquired by the player through practice and training through special exercises in educational units and according to his physical ability, and it depends mainly on the player's physical qualities that qualify him to possess these motor abilities, including motor coordination, which aims to organize the performance of movement by connecting the body parts of the player during the movement, and is represented by some forms of motor coordination, namely strength characterized by speed, motor flexibility, motor coordination, balance and others, because of its role in mastering the technical performance of basic skills in youth volleyball.

The volleyball player must possess the ability of motor coordination in order to help move quickly and strongly on the court while executing the skills of serving and hitting aces, to have the ability to move the arms and joints to the widest possible range and with high flexibility, and the ability to time body movements correctly when performing the motor response, so having the ability to control and sensory perception will help to receive sensory information from various senses and guide the performance correctly, as she defines (Nahida Abd: 1: p. 74) Motor coordination in volleyball is the ability to coordinate and control movements to achieve effective performance in various skills, such as serving and striking, which are two of the offensive skills that depend on the strength characterized by speed, in addition to the ability of motor coordination to ensure the implementation of the ball hit with high accuracy. Good motor coordination in volleyball helps the player to execute the motor duty well, which leads to the control of motor performance and does not fall into error as a result of compatibility and flexibility, which leads to the effectiveness of the attacker in executing the aces.

The importance of the research was evident in highlighting the role of motor coordination as a motor ability needed by the volleyball player when implementing the two skills, as it is the basis that the player must possess the motor abilities in the implementation of the technical performance of the skill sections, so the ability of the serving player to send the ball strongly, quickly and accurately to the court of the opposing team, so that the hitting of the crushing ball away from the blocking wall and towards the team's weaknesses in defense, leading to an important point for the team.

1.2 Research Problem: The need to highlight the role of motor coordination in the success of the player who performs the aces is evident in organizing the role of some motor abilities such as speed, coordination and flexibility when the player performs the skill of serving or hitting aces in volleyball. The researcher,

through his field observation of the youth volleyball league competitions and his work in the game federation as a supervisor of the league matches, as the poor level of accuracy of the performance of the two offensive skills by the team players is particularly worrying during the start of the serve or aces in the match, and this indicates that there is a weakness to which volleyball coaches must upgrade the skill level of their players to keep pace with the performance of international teams for the game, and that this weakness lies in the preparation stages as a result of not using physical exercises for motor abilities in educational units and modern methods and methods of learning.

3-1 Research Objectives:

1. To identify the relationship of some forms of motor coordination with the accuracy of performing the skill of high aces in youth volleyball.

2. To identify the relationship of some forms of motor coordination with the accuracy of the performance of the skill of high aces in youth volleyball.

4.1 Research hypotheses:

1. There is a statistically significant correlation between some forms of motor coordination and the accuracy of performing the skill of high aces in youth volleyball.

2. There is a statistically significant correlation between some forms of motor coordination and the accuracy of performing the skill of high aces in youth volleyball.

1.5 Areas of research:

1.5.1 Human Domain: Maysan Oil Club youth volleyball players.

1.5.2 Time frame: (2/6/2025 to (7/29/2025).

1.5.3 Spatial area: Closed gymnasium in Maysan Governorate.

1.6 Keywords:

Motor coordination: (Hussein Mohammed: 2: p 84) is the harmonious performance of body parts that involve movement, and depends on several factors, including gross motor movement, fine motor movement and motor planning.

Accuracy of aces: (Nahida et al: 3: p. 61) The player's achievement of the level of accuracy in the execution of the skill depends mainly on the correct motor coordination of the speed of rise and the strength of the hitting arm of the ball when implementing the basic stages of the skill.

Accuracy of the skill of the crushing blow: (Jassim Khudair: 4: p 33) Accuracy depends on the player's special motor abilities such as the explosive ability of the arms and legs, in addition to the accuracy of motor coordination and player concentration, in order to achieve high accuracy in skill performance.

Youth Volleyball: They represent the category of young players with ages (17-21) within the FIVB classification and according to the official rules of volleyball (2014-2021).

2. Research methodology and field procedures: The researcher used the descriptive method of correlation because it is the best scientific method, which is commensurate with the nature of the study issue to find solutions to it and commensurate with the nature of the study and the objectives to be achieved and the hypotheses that were formulated.

2.1 Research population and sample: The research community was represented by the players of the country's youth volleyball clubs, and the research sample were the players of Naft Maysan Club in youth volleyball and their number (12) players who participated in the game league for the season (2024) and were selected by the random method, and the researcher was keen to select two players for the purpose of conducting the exploratory experiment in line with the requirements of conducting scientific research, as he performed a homogenization process for the study sample in the following variables (height, mass, chronological age, training age) and table (1) shows this.

Table (**1**) shows the homogeneity of the research sample in the variables (height, weight, chronological age, training age)

No.	Variables	Unit of Measurement	Arithmetic mean	Median	Standard Deviation	Coefficient of variation	Result
1	Height	cm	188.500	188.000	3.344	0.449	Homogeneous
2	Mass	kg	79.600	79.200	4.224	0.284	Homogeneous
3	Chronological Age	years	19.600	19.000	2.100	0.857	Homogeneous
4	Training Age	years	8.500	8.200	1.367	0.658	Homogeneous

2-2 Data collection methods and tools: The researcher used a set of tools and devices in applying the physical and skill tests specific to the research in order to obtain the results and process them statistically.

1- Tools and devices: These include a volleyball court, 12 balls, a referee whistle, tapes to mark the players' movement during the test, and a Dell computer.

2- Data collection methods: These include the Arabic sources used by the researcher in his study, as well as a set of questionnaires for the purpose of surveying the opinions of experienced and specialized individuals, questionnaires for recording the results of tests of accuracy in serving and spiking in volleyball, and questionnaires for collecting data for statistical processing.

2-3 Determining the research tests: The researcher was keen to benefit from the expertise of distinguished professors specializing in motor learning, testing, and volleyball by presenting a questionnaire that included a set of proposed physical and skill tests in volleyball. in order to inform the ten experts of the questionnaire and obtain their scientific opinions on it and determine the most appropriate and suitable test for the study. After a week, the researcher began collecting the questionnaires from them to find out which tests were suitable for application to the research sample, and obtained 100% agreement from the experts.

3-1-1 Physical tests:

1- Arm strength and speed test. (Yasser Mahmoud: 5: p. 123)

The aim of the test is to measure the strength of the arm muscles. This test is used to measure the strength and speed of the striking arm for a period of 10 seconds and is used in volleyball and some other sports. It involves bending and extending the arm quickly to achieve strength and speed in hitting the ball.

How to do the test: The player does the test from a prone position with their face facing the ground and their body in position, as long as their chest doesn't touch the ground. When they hear the starting whistle, they start bending and extending their arms continuously for the allotted time (10 seconds).

Recording: The number of times the test subject performs the test correctly in 10 seconds is recorded.

2- Coordination test. (Ali, Sadiq, and Ali: 6: p. 67)

The aim of the test is to measure the motor coordination between the arms, legs, and eyes.

Tools: A 24-inch rope, tied at both ends, with a distance of 16 inches between the knots, which is the distance to be jumped between, leaving a distance of 4 inches outside each knot to be used to hold the rope.

Method of performance: The tester holds the rope at the specified points and jumps over the rope so that it passes in front of and under the feet (the test is repeated five times by the player being tested).

Recording: Record the number of correct jumps out of the five attempts made by the tester.

3- Motor flexibility test: (Mahjoub Ibrahim: 7: p. 83)

- The aim of the test is to measure the flexibility of the shoulder joints.

Tools used: Gymnastic sticks with a diameter of 2 cm and a length of 120 cm, measuring tape.

Method of performance: The test subject stands holding the stick with both hands in the middle so that the hands are close together. The test subject raises their arms high in front of them and behind them to reach as far behind their body as possible with the stick, without bending their elbows to pass the stick behind their body with their arms extended. The test subject must move their hands apart from each other to perform the movement correctly. The result is an indicator of flexibility; the lower the indicator, the better.

Recording method: Each test subject has two attempts, and the best result (shortest distance) is recorded. The distance between the fists is measured after the stick is stabilized behind the body, according to the following equation = Distance between fists (cm)

Shoulder width (cm)

3-1-2 Skill tests:

1- Test of accuracy in performing the smash skill in volleyball. (Marwan Abdulmajeed: 8: p. 129)

Test procedure: Volleyball court The court opposite the test subject is divided into two equal triangles, and the inner triangle is divided into three areas, each measuring 3 meters. The test subject performs a smash toward the inner triangle on the side of the court opposite the net.

Scoring: Each test taker has five attempts, and points are awarded according to where the ball lands:

A - First zone (3) points, B - Second zone (1) point, C - Third zone (5) points, D - Outside these zones, the test taker receives (zero) points. E. The final score for this test is 25 points.

2. Test of accuracy in performing the smash skill in volleyball. (Ali Salman: 9: p. 112)

Test procedure: The tester stands in the serving area in the middle of the end line of the court (the half facing the half of the court divided at a distance of 9 m from the net). The player stands holding the ball and performs the smash skill so that the ball crosses the net to the opposite court, which is divided into seven squares. The last square is worth 5 points, the second square is worth 2 points at the center of 5,1, the third square is worth 1 point at the center of 6, the fourth square is worth 3 points, and the fifth square is worth 4 points at the center of 4,2.

Scoring: Each player is given 5 attempts. The final test score is 25 points. The player is awarded the points for the zone where the ball lands correctly. If the ball lands on the line in a neutral zone, the player is awarded the points for the highest zone. If the ball touches the net or lands outside the court, it counts as one of the five attempts.

2-6 Scientific basis for the tests: The researcher sought to adopt scientific principles in the testing process, despite the fact that the tests were standardized, in order to ensure that they corresponded to the variables of the study in practical terms, in accordance with scientific research standards.

Exploratory experiment: This is a procedure carried out by the researcher on a selected group consisting of two players from the research community and outside the study sample, with the aim of applying physical and skill tests to the research sample, in order to determine the appropriate time needed to apply the field tests in accordance with the indoor sports hall and the tools and equipment available therein to conduct the exploratory experiment with the help of the work team, by applying the two tests on (15/6/2025) and re-administering them seven days later on the same sample on (22/6/2025).

2-6-1 Validity: The researcher used the content validity method (Mohammed Jassim: 10: p. 87), "which is to measure the test with a high degree of what it claims to measure." This is done by presenting the tests to experts and specialists, who agreed that these tests are valid for measuring what they were designed to measure, as shown in Table (3).

Table (**3**) shows the apparent validity results of the research tests for young volleyball players.

Test name	validity		Calculated chi-square	Tabulated chi-square	Significance level	Significance
	valid	Not valid				
Arm Strength Test	10	0	10.000	—	0.000	Significant
Motor Coordination Test	10	0	10.000	—	0.000	Significant
Arm Flexibility Test	10	0	10.000	3.84	0.000	Significant
Smash Serve Test	10	0	10.000	—	0.000	Significant
Smash Hit Test	10	0	10.000	—	0.000	Significant

2-6-2 Stability: The researcher used the test and retest to calculate the stability of the two tests by applying the tests to a sample of two players. The researcher used Pearson's simple correlation coefficient between the scores of the two tests, and the result in the motor coordination tests was (0.89). accuracy tests for serving and smashing skills (0.92), as shown in Table (4).

2-6-3 Objectivity: The objectivity of the two tests was established by presenting them to experts and specialists, whose opinions were similar and gave an objectivity rating of (0.92) for the motor coordination test and (0.93) for the accuracy of serving and smashing skills test, as shown in Table (4).

Table (4) shows the results of the stability and objectivity of the research tests for young volleyball players.

Test name	Test stability	Significance level	Significance	Test objectivity	Significance level	Significance
Arm strength test	0.873	0.000	Significant	0.847	0.000	Significant

Motor coordination test	0.893	0.000	Significant	0.863	0.000	Significant
Arm flexibility test	0.904	0.000	Significant	0.942	0.000	Significant
Smash serve test	0.932	0.000	Significant	0.954	0.000	Significant
Smash hit test	0.885	0.000	Significant	0.899	0.000	Significant

2-7 Main experiment: The researcher conducted field tests for the study variables on May 22-23, 2025, in the indoor sports hall in Maysan on a sample of 10 young volleyball players. On the first day, April 3, 2025, tests were conducted for some forms of motor coordination under study. On the second day, tests were conducted on the accuracy of the serving and smashing skills in volleyball under study.

2-8 Statistical methods: In order to process the results of the study tests, the researcher used the statistical program (SPSS) version (29) to put them in tables for presentation, analysis, and discussion.

3- Presentation, analysis, and discussion of research results:

3-1 Presentation of descriptive data results for research variables for some forms of coordination and accuracy of serving and smashing skills among young volleyball players:

Table (5) shows the results of the research variables for some forms of coordination and the accuracy of the serving and smashing skills of young volleyball players.

Test name	Arithmetic mean	Median	Standard deviation	Standard error	Coefficient of variation	Highest score	Lowest score	Range
Speed-specific strength of the arm	19.450	19.000	2.770	0.801	0.487	21	17	4
Kinetic compatibility	38.344	38.000	1.880	0.543	0.549	42	35	7
Kinetic flexibility of the arms	1.67	1.500	0.807	0.632	0.233	1.70	1.58	0.12
Smash accuracy	18.443	18.000	2.833	0.819	0.469	20	16	4
Smash accuracy	17.739	17.000	2.422	0.700	0.915	20	15	5

3-2-1 Presentation of the results of the correlation between the arm's speed-specific strength test and the accuracy of the serve and smash skills of young volleyball players:

Table (6) shows the results of the arithmetic means, standard deviations, calculated correlation coefficients, and significance levels between the arm speed strength test and the accuracy of the serve and smash skills.

Test Name	Unit	Arithmetic mean	Standard deviation	Calculated correlation value	Significance Level	Significance
The distinctive power of the arm's speed	kg	19.450	2.770	—	—	—
The accuracy of the overwhelming serve	Score	18.443	2.833	0.885	0.000	Significant
The accuracy of the overwhelming shot	Score	17.739	2.422	0.864	0.000	Significant

Degree of freedom (n-2) = 10, significance level (0.05)

Table 6 shows that in the arm speed test, the mean was 19.450 and the standard deviation was 2.770. while the arithmetic mean for the skill (smash serve) was (18.443) and the standard deviation was (2.833). The simple correlation coefficient (Pearson) between them was (0.885) below the significance level (0.000), which is less than (0.05) with a degree of freedom (10). This confirms the existence of a positive correlation between the arm speed strength test and the smash skill of young volleyball players. The researcher attributes this correlation to the fact that speed strength is an important and essential element in the players' performance of the smash skill, which enabled them to obtain a good average scores in accuracy tests

In the arm speed strength test, the arithmetic mean was 19.450 and the standard deviation was 2.770, while the arithmetic mean for smash skill was 17.739 and the standard deviation was 2.422 for the sample. the simple correlation coefficient (Pearson) between them was (0.864) below the significance level (0.000), which is less than (0.05) with a degree of freedom (10). This confirms the existence of a significant positive correlation between arm strength and smash skill in young volleyball players. The researcher attributes this significant

correlation to the fact that speed-specific strength is an important and essential component in players' performance of the smash skill, which enabled them to achieve a good arithmetic mean in the accuracy test accuracy tests.

3-1-2 Presentation of the results of the correlation between the motor compatibility test and the accuracy of the serving and smashing skills of young volleyball players:

Table (7) shows the results of the arithmetic means, standard deviations, calculated correlation coefficients, and significance levels between the motor coordination test and the accuracy of the serve and smash skills.

Test Name	Unit	Arithmetic mean	Standard deviation	Calculated correlation value	Significance Level	Significance
Motor Coordination	Seconds	38.344	1.880	—	—	—
Smash Serve Accuracy	Score	18.443	2.833	0.855	0.000	Significant
Smash Hit Accuracy	Score	17.739	2.422	0.840	0.000	Significant

Degree of freedom (n-2) = 10, significance level (0.05)

Table 7 shows that in the motor coordination test, the arithmetic mean was 38.344 and the standard deviation was 1.880, while the arithmetic mean for the smash skill was 18.443 and the standard deviation was 2.833 in the application sample. The simple correlation coefficient (Pearson) between them was 0.855, below the significance level (0.000), which is less than 0.05 with a degree of freedom of 10. This confirms the existence of a significant positive correlation between the motor coordination test and the smash skill of young volleyball players. The researcher attributes this significant correlation to the fact that motor coordination is an essential element in the players' performance of the smash skill well, which enabled them to obtain a good arithmetic mean in accuracy tests.

In the motor coordination test, the arithmetic mean was 38.344 and the standard deviation was 1.880, while the arithmetic mean for smash skill was 17.739 and the standard deviation was 2.422 in the sample. The simple correlation coefficient (Pearson) between them was 0.840, below the significance level (0.000), which is less than 0.05 with a degree of freedom of 10 This confirms the existence of a positive correlation between the motor coordination test and the smash skill of young volleyball players. The researcher attributes this

correlation to the fact that motor coordination is an essential element in the players' performance of the smash skill, which enabled them to obtain a good arithmetic mean in accuracy tests.

3-1-3 Presentation of the results of the correlation between arm flexibility and the accuracy of serving and smashing skills in young volleyball players:

Table (8) shows the results of the arithmetic means, standard deviations, calculated correlation coefficients, and significance levels between the arm flexibility test and the skills of serving and smashing.

Tests	Unit	Arithmetic mean	Standard deviation	Calculated correlation value	Significance Level	Significance
Kinetic flexibility of the arms	Repetition	1.67	0.807	—	—	—
Accuracy of the crushing throw	Grade	18.443	2.833	0.877	0.000	Significant
Accuracy of the crushing strike	Grade	17.739	2.422	0.850	0.000	Significant

Degree of freedom (n-2) = 10, significance level (0.05)

Table 8 shows that in the arm flexibility test, the arithmetic mean was 1.67 and the standard deviation was 0.807, while in the smash skill test, the arithmetic mean was 18.443 and the standard deviation was 2.833. The simple correlation coefficient (Pearson) between them was (0.877) below the significance level (0.000), which is less than (0.05) with a degree of freedom (10). This confirms the existence of a significant positive correlation between the arm flexibility test and the smash skill of young volleyball players. The researcher attributes this significant correlation to the fact that flexibility is an important and essential element in the players' performance of the smash skill, which enabled them to obtain a good average good scores in accuracy tests.

The arithmetic mean for the arm flexibility test was (67.200) and the standard deviation was (1.221), while the arithmetic mean for smash skill was (17.739) and the standard deviation was (2.422) for the sample. the simple correlation coefficient (Pearson) between them was (0.850) below the significance level (0.000), which is less than (0.05) with a degree of freedom (10). This confirms the existence of a positive correlation between the arm flexibility test and the smash skill of young volleyball players. The researcher attributes this correlation to the fact that flexibility is an important and essential element in the players' performance of the smash skill, which enabled them to obtain a good average score in accuracy tests.

3-2 Discussion of research results for some forms of coordination and accuracy of serving and smashing skills among young volleyball players:

The results presented in Tables (8.7.6.5) for the research variables in the motor coordination tests, specifically the speed strength test for the arms, motor coordination, and motor flexibility of the arms, that there is a significant positive correlation between the performance of young volleyball players and their serving and smashing skills. as the level of this correlation can be observed from the points obtained by the players in the accuracy tests for serving and smashing skills. The accuracy of the two skills by the server or smasher depends

on the level of their motor abilities for some forms of motor coordination, The distinctive strength of the arm's speed is an ability that the player needs when executing the skill in order to achieve the necessary power to hit the ball in a way that makes it difficult for the opposing team's players to defend the ball. The speed of the arm's forward and upward movement will make it difficult for the opposing team's defense to determine the ball's trajectory and receive it. Motor coordination is needed by the player in his performance when executing the skill through the coordination of the body's limbs to achieve harmony in the proper execution of the movement, which leads to accuracy in performing the skill. The motor flexibility of the arms is represented by the ability of the player performing the skill to move the arms as far as possible so that he can hit the ball with maximum speed and power across the net into the opposing team's court in order to win a point for his team during the match.

The researcher attributes the results of the motor coordination tests to the fact that volleyball players need to possess speed-specific strength, as it forms the basis for performing these two skills with high precision. The player's ability to jump and hit the ball depends on possessing speed-specific strength, particularly for this motor skill (Abdul Basit: 11: p. 19). “It is their ability to produce maximum force in the shortest possible time, which is an essential skill in many movements of the game, such as smashes and powerful serves.” Motor coordination is the player's ability to coordinate body movements while performing a skill, and this depends on their ability to connect their body parts in a way that ensures the sequence of the technical stages of the skill, leading to accuracy in execution (Abdullah: 12: p. 42). “Motor coordination is the ability of an individual to move two or more different muscle groups in different directions at the same time” and powerful serves. The motor flexibility of the arms of a player performing a serve or a smash is an important and necessary element in the accuracy of performance, as a result of their ability to move their arms in the best way when executing the skill. Therefore, the performance of

powerful and accurate movements in volleyball, such as serving and smashing, depends on the motor flexibility of the player's arms during performance.

In conclusion, the researcher believes that motor coordination is closely related to the performance of the serve and smash skills among young volleyball players, and that this positive relationship contributes effectively to the player's success in executing the skill as a result of possessing the distinctive strength of speed, motor coordination, and motor flexibility of the arms, and that these motor abilities give the player a lot of room when performing his motor task.

4- Conclusions and recommendations:

4-1 Conclusions:

1- The results showed a statistically significant correlation between motor coordination (characterized by speed, flexibility, and motor coordination) and the accuracy of the high smash skill among youth volleyball players.

1. The results showed a statistically significant correlation between motor coordination (characterized by speed, flexibility, and motor coordination) and the accuracy of the high smash skill among youth volleyball players.

3. There is a positive correlation between motor coordination and the accuracy of the serve and high smash skills of young volleyball players.

4-2 Recommendations:

1- Emphasize the importance of developing motor coordination skills during the preparatory stages in general, and among young people in particular, due to its importance in the accuracy of serving and spiking skills in volleyball for young people.

2- Emphasize the need for coaches to focus on developing (strength characterized by speed, flexibility, and motor coordination) due to its fundamental role in the accuracy of serving and spiking skills in youth volleyball.

3- Emphasizing the need to conduct research and studies on motor abilities, including motor coordination, due to their great importance in developing the accuracy of serving and spiking skills in youth volleyball.

(References)

1- Naheeda Abdul Zeid Al-Dulaimi: Fundamentals of Motor Learning: Iraq. Najaf Al-Ashraf: Dar Al-Dhiaa for Printing and Publishing, 2014, p. 72.

2- Hussein Muhammad Abu Riyash: Principles and Foundations of Cognitive Learning: Vol. 1, Jordan. Amman, Dar Al-Masira Publishing, Distribution and Printing, 2024, p. 51.

3- Naheeda Abdul et al.: Principles of Modern Volleyball: Jordan. Amman, Al-Ghad for Printing and Publishing, 2020, p. 65.

4- Jassim Khudair Sakhi: Basic Principles in Volleyball Education and Training: Iraq. Baghdad, Al-Maktaba Al-Asriya for Publishing and Distribution, 2021, p. 33.

5- Yasser Mahmoud Wahib: Fundamentals and Concepts of Measurement and Evaluation in Physical Education: Iraq. Baghdad: Dar Al-Kitab, 2023, p. 106.

6- Ali Samoum, Sadiq Jafar, and Ali Mutair: Measurement, Testing, and Evaluation in Sports: Iraq. Baghdad: Ministry of Higher Education and Scientific Research Press, 2015, p. 67.

7. Mahjoub Ibrahim Yassin: Tests and Measures in Physical Education and Sports Science: Vol. 1, Iraq. Baghdad: Dar Al-Doktora Al-Sciences, 2015, p. 83.

8- Marwan Abdul Majid: Scientific Encyclopedia of Volleyball, Skills, Plans, Physical and Skill Tests: 1st edition, Jordan. Amman, Al-Waraq Publishing House, 2019, p. 129.

9- Ali Salman Abdul Tarfi: Applied Tests in Physical Education: 1st edition, Iraq. Baghdad, Afaq Publishing and Distribution Office, 2002, p. 112.

10. Muhammad Jassim Al-Yasiri: Tests and Measurement in Physical Education: Vol. 1, Iraq. Baghdad, Al-Israa for Printing, Publishing and Distribution, 2018, p. 87.

11- Abdul Basit Mubarak: Motor Learning and Performance: Egypt. Cairo, 1st edition, Dar Al-Yazouri Scientific Publishing, 2014, p. 19.

12- Abdullah Mahmoud: Motor Learning in Sports: 1st edition, Egypt. Cairo: Dar Al-Hamid Publishing and Distribution, 2019, p. 42.