CONTROL, REACTION SPEED, AND THEIR CONTRIBUTION TO THE ACCURACY OF RECEPTION FROM SPIKE SERVE AND COURT DEFENSE FROM POSITION (4) AMONG PREMIER LEAGUE VOLLEYBALL PLAYERS

Asst. Prof. Dr. Amjad Hamed Badr ,College of Physical Education and Sports Sciences – University of Tikrit, Iraq.

a_albadr@tu.edu.iq

Abstract

The study aimed at:

1. Identify control, reception accuracy from the spike serve, and court defense, as well as the relationship between them from position (4) among volleyball players in the study sample.
2. Examine the contribution of control and reaction speed to reception accuracy from the spike serve and court defense from position (4) among volleyball players.
3. Identify the relationship between reaction speed, reception accuracy from the spike serve, and court defense from position (4) among volleyball players in the study sample.

Using a survey methodology and correlational analysis, the researcher used the descriptive method. With eight clubs and fourteen players per club competing in the Iraqi Premier League, the research population was purposefully chosen to include Premier League volleyball players for the 2024–2025 season. To get results, the researcher used the court defense exam, the visual selective attention test, and the spike serve reception accuracy test. The Statistical Package for the Social Sciences (SPSS) was then used to statistically process the data.

The study reached several conclusions, the most important of which are:

- There is a meaningful relationship between the control index and the performance of defensive skills in volleyball among Premier League club players.
- Control has a positive effect on defensive skill tests in volleyball among Premier League players.
- There is a meaningful relationship between the reaction speed index and defensive skill tests in volleyball among Premier League players.

Keywords: Control, Reaction Speed, Reception Accuracy, Spike Serve, Volleyball.

1-1 INTRODUCTION AND RESEARCH SIGNIFICANCE:

Court defense and serve receiving stand out as crucial components that help players score points and disrupt opponents among the core abilities that set them apart at higher levels. Players that possess these abilities must have a high degree of control and quick reflexes, particularly in defensive positions like Position (4), which are essential for both receiving the ball and guarding the court. The Premier League is the pinnacle of volleyball competition, with players highlighting their advanced abilities. Increasing team competitiveness and reaching more sophisticated and efficient performance levels can be achieved by helping players perform better by strengthening their defensive skills (Cox et al., 2019, 119).

Since control and response time are the main factors affecting a volleyball player's capacity to make and precisely carry out the right judgments when receiving a powerful serve, this study emphasizes two essential components. These elements give the team a chance to develop a successful counterattack and improve game continuity (Kessel, 2017, 89). Given that study shows that a player's reaction time is a critical component in

how they react to quick and unpredictable balls, this performance necessitates a combination of mental and physical skills (Sheppard & Young, 2006, 919-932). Furthermore, neuromuscular control is essential for enhancing reception performance and lowering errors brought on by the serve's power and angle (Zatsiorsky & Kraemer, 2006, 131).

One cognitive mechanism that keeps people awake and mentally prepared to concentrate on a single visual stimulus out of a variety of competing ones is selective visual attention. It has a significant impact on performance, whether in technical volleyball skills or rule execution. Similarly, spatial intelligence—the players' awareness of what is going on the court and their surroundings, including symbols and other figures—is similarly significant in determining cognitive characteristics and evaluating players' spatial ability.

Numerous theoretical and practical facets of sports sciences and volleyball performance development contribute to the importance of this study. While offensive skills like attacking and forceful serving have been the subject of numerous studies, more research is still needed to fully understand defensive performance components, especially serve reception and court defense. By concentrating on how control and response time affect the accuracy of forceful serve reception and court defense, this study seeks to close the knowledge gap and strengthen the body of research in this area. Position (4) is one of the key positions on the court, requiring players to balance defensive and offensive skills. Improving control and reaction speed in players occupying this position can lead to a reduction in defensive errors and an increase in reception effectiveness, enhancing attack continuity and improving the overall team performance (Palao et al., 2004, 50-63).

1-2 RESEARCH PROBLEM:

The demands of various activities, which vary in size and complexity, as well as a person's cognitive ability determine how efficiently they work, whether it be in problem-solving or the amount of time needed to do a task. These requirements cover both basic and sophisticated mental tasks, such as self-control and quick reflexes. One of the most important aspects of volleyball is defensive play, particularly given how offensive tactics are always changing and becoming more intricate at the top levels of competition. One of the most difficult defensive positions is receiving a strong serve, which calls for quick thinking and accurate reactions to manage a ball moving at fast speeds and intricate angles. The player's success in countering the serve is closely linked to several factors, most notably neuromuscular control and reaction speed (Sheppard & Young, 2006).

Considering this, players in the Premier League's Position (4) face many difficulties because of their strategic function, which calls for them to execute two tasks: protecting the front and back sections of the court and receiving strong serves. Field observations and performance reports, however, show that players' reception accuracy varies noticeably, which impacts game continuity and counterattack development (Zaytoun, 2019; Palao et al., 2004).

Thus, the research problem emerges in quantifying and assessing control, reaction speed, and the accuracy of defensive technical skills in volleyball.

1-3 RESEARCH OBJECTIVES:

1. To identify control and accuracy in receiving powerful serves and defending the court from Position (4) among the volleyball players in the study sample.
2. To examine the relationship between control and the accuracy of receiving powerful serves and defending the court from Position (4) among the volleyball players in the study sample.
3. To determine the contribution of control, reaction speed, and accuracy in receiving powerful serves and defending the court from Position (4) among volleyball players.
4. To identify reaction speed and accuracy in receiving powerful serves and defending the court from Position (4) among the volleyball players in the study sample.

5. To examine the relationship between reaction speed and the accuracy of receiving powerful serves and defending the court from Position (4) among the volleyball players in the study sample.
6. To determine the contribution of reaction speed and accuracy in receiving powerful serves and defending the court from Position (4) among volleyball players.
7. **1-5 Research Scope:**
8. **1-5-1 Human Scope:** Players of premier league volleyball clubs for the 2024-2025 season.
9. **1-5-2 Temporal Scope:** From November 27, 2024, to February 26, 2025.
10. **1-5-3 Spatial Scope:** Sports halls of the clubs under study.

3-1 Research Methodology:

The nature of the research problem determines the appropriate methodology. Therefore, the researcher adopted a **descriptive method** using the **survey approach and correlational relationships**, as it aligns with the nature of the problem.

3-2 Research Population and Sample:

The researcher deliberately selected the research population, which consists of **players from premier league volleyball clubs** for the **2024-2025 season**. The total number of clubs included in the study is **eight (8)**, with **fourteen players per club**, all officially registered in the Iraqi Premier League. The sample was divided as follows:

- **Pilot Study Sample:** eight players, representing **7.142%** of the total population.
- **Main Experiment Sample:** forty-two players, representing **37.5%** of the total population.

Details are presented in **Table (1)**.

No.	Club	Total Number	Pilot Study Sample	Main Experiment Sample
1	Al-Shorta	14	-	14
2	North Refineries	14	-	14
3	Erbil	14	-	14
4	Al-Daghara	14	-	-
5	South Gas	14	-	-
6	Peshmerga	14	-	-
7	Nineveh	14	-	-
8	Al-Muqdadiya	14	8	-
Total	**112**	**8**	**42**	

3-3 Tools, Devices, and Instruments Used in the Research

3-3-1 Information Collection Methods:

- Scientific sources (Arabic and foreign).
- The Internet (International Information Network).
- Tests and measurements.
- Personal interviews (*).
- Test result recording forms.
- A survey questionnaire for expert opinions on determining skill tests.

3-3-2 Devices Used in Research:

- **Canon camera** (1 unit).
- **Dell laptop**.
- **Reha COMM for Selective Attention (GONT)**.

One of the most sophisticated computerized psychological assessment instruments in the Center for Educational Studies and Psychological Research at the University of Baghdad Presidency was the German-made Reha COMM testing and evaluation system, which the researcher used. This system allows the use of a variety of tests, examinations, and measurement programs and represents the most recent advancements in computerized psychological evaluation technology.

The system provides highly accurate and objective results, free from human errors, as it measures values that cannot be assessed using paper, pen, or direct observation.

Although Reha COMM has been used extensively in several nations worldwide, it was not until the end of 2017 that the laboratory's director, Dr. Huda Jamil Abdul Ghani, brought it to Iraq. With over thirteen more tests and programs than the Austrian Vienna Test System, it is today regarded as the most sophisticated instrument for carrying out intricate and thorough evaluations. The Iraqi Student Foundation is the owner of the system.

The **core strength** of Reha COMM lies in its **software**, which constitutes **85%** of its computational capabilities, relying on multiple training programs and various tests in the fields of psychological, mental, and medical assessment.

The purpose of the Selective Visual Attention Test was to enable participants to engage with the digital panel, electronic screen, and control buttons while the information was processed electronically precisely and objectively. One of the most important and crucial components of many sporting activities is selective attention, namely reaction speed and reaction speed control.

3-3-3 Tools Used in Research:
- A **regulation volleyball court**.
- **Mikasa volleyballs** (5 units).
- **Whistle** (1 unit).

3-4 Defining the Research Variables:

To define the research variables, the researcher used a series of tests that can gather information about individuals, ensuring a proper and valid comparison between them.

3-4-1 Selective Visual Attention Test:

With the assistance of the concerned operator, the researcher examined the system, its devices, and its components before administering the Selective Visual Attention Test. The researcher was able to obtain a thorough and accurate grasp of the equipment, the test's methodology, and its capacity to assess the mental talents being studied following an interview and direct questioning. The players will take the test, which will allow the researcher to determine which variables the Selective Visual Attention Test measures:

1. **Reaction speed**.
2. **Control over reaction speed**.
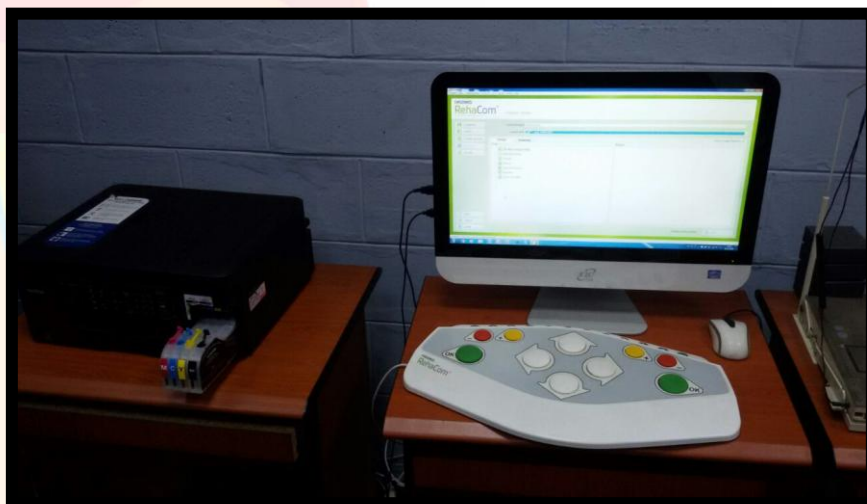
"Figure (1) shows the Reha COMM system for testing and evaluation."

which, in addition to the variety of technical skills and offensive and defensive tactical strategies, is one of the fundamental requirements of volleyball, which is characterized by speed and accuracy in performance, short contact times with the ball, and a smaller court than other team sports.

The researcher used the sophisticated Reha COMM system (Reha COMM) with the scientific code (GONT) for measurement to stay up to date with the notable advancements in the field of measurement and evaluation. This was necessary because there was no objective, accurate test that yielded actual results for the cognitive ability used in the study.

Specifications of the Visual Selective Attention Test:

The subject looks directly at the black electronic screen while seated in front of the gadget on a chair that can be raised or lowered, as necessary. The green control button on the moving keyboard, which may be moved to be directly beneath the finger, is then approached by the subject with their index finger.

Test Stages:

The stages of the test in the Reha COMM system are like those in the Vienna system (VTS), also consisting of three stages, but they break down the ability into its basic components:

1. **Instruction Stage:** The person in charge of the device gives detailed information to the subjects about how to use the device, what stimuli will appear, and the method to follow to achieve the best results, ensuring that the subject is fully prepared to work with the speed and precision of the device.
2. **Training Stage:** This stage follows the instructions, where the subject practices how to perform the test for one minute, as set by the device. In this stage, the device does not give the subject any further chances for training or reviewing instructions, unlike the Vienna system. The system will stop if the subject makes three mistakes or fails to respond within five minutes, ensuring high accuracy and objectivity.
3. **Testing Stage:** After the one-minute training stage, the test stage begins. The subject is required to press the green button on the keyboard when the green square, divided into vertical or horizontal rectangles, appears. For example, if the system asks the subject to respond to the square with vertical rectangles and ignores the horizontal one, the subject's reaction speed and control should focus solely on the vertical rectangles among several random options provided by the system. After the test is completed, the responses are transferred to the computer, which in turn sends them to the device's printer, generating a final report with all the information about the subject, as follows:
   - Date

- Correct responses
- Mistakes
- Omissions
- Outliers
- Anticipations
- Average reaction time (ms)
- Median reaction time (ms)
- Standard deviation reaction time (ms)
- Z-value for reaction speed
- Z-value for reaction control.

The graph shows the time in milliseconds, ranging from zero to six hundred, and the stimulus sequence.
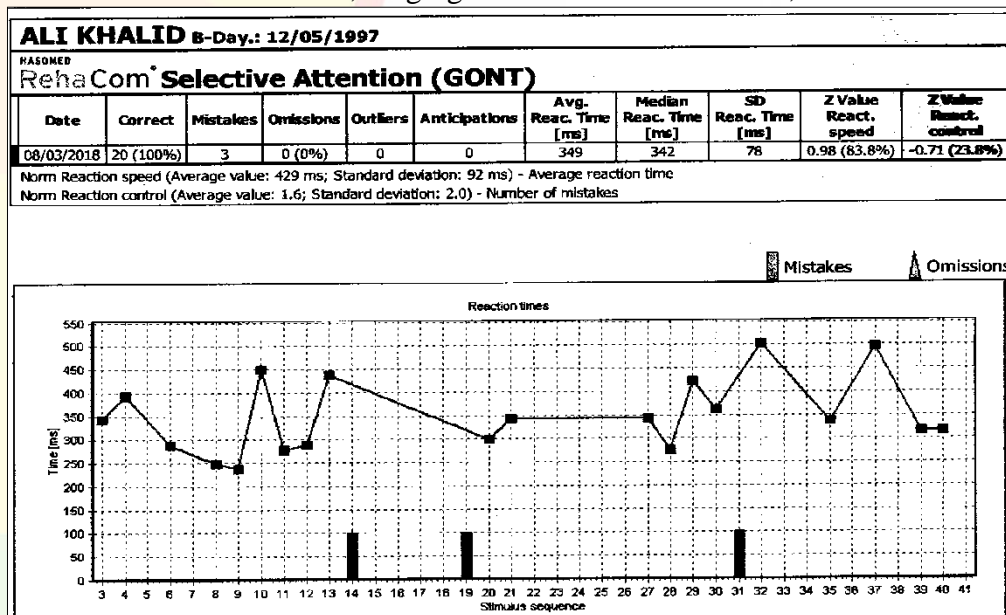
"Figure (2) shows the graph of time and stimulus frequency."

Figure (3) shows the subject's data.

3-4-2 Reception Accuracy and Court Defense Tests:

Test Name: Reception Test (Al-Samaida'i & Al-Shawk, 2010, p. 373)

Purpose: To measure reception accuracy from the serve.

Performance Specifications: A mat is placed on the box at position (3), and the subject performs ten attempts from each of the three backcourt positions (Position 1, Position 6, Position 5). The other player serves from the designated serving area in the opposite half of the court.

Scoring Conditions:

- **Four points** for each correct pass where the ball lands on the mat.
- **Three points** for each correct pass where the ball touches the mat's boundaries.
- **One point** for each correct pass where the ball lands inside the 3-meter zone.
- **Zero points** for each pass where the ball lands outside the 3-meter zone.
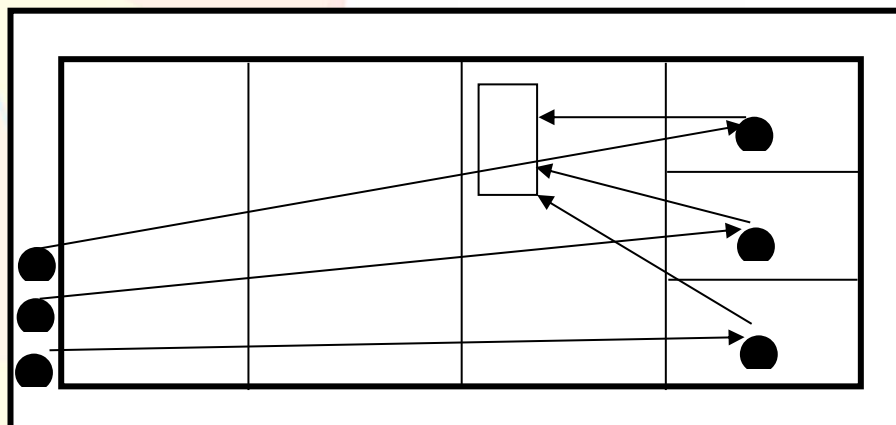

Figure (4) illustrates the Reception Test.

Defending the Court from the Back Area (Hassanien & Abdelmonem, 1997, p. 253):

- **Objective of the test**: To measure the accuracy of the skill of defending the court.
- **Tools used**: A legal volleyball court, five legal balls, and a colored tape to divide the court as shown in the figure below.
- **Performance Specifications**: The player stands ready to defend against a spiked ball from center (1). The coach stands on the opposite side of the court at a table to spike the ball toward the back area, and the player performs the defense as required by the situation.
- **Performance Conditions**: Each player is given three attempts from each area (5, 6, 1), with a maximum score of 27. If the defended ball goes out of bounds, the attempt receives a score of zero.
- **Scoring**: The player is awarded points based on the area where the ball lands.
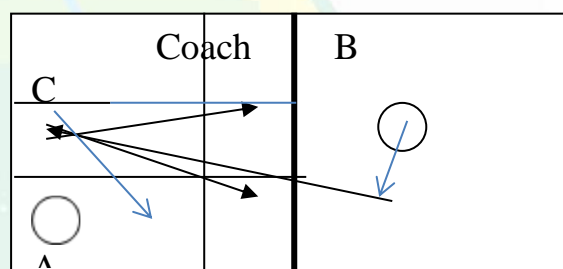
"Figure (5) (Test of Accuracy in Defending the Court)".

Test of Accuracy in Receiving Thrown Balls (Power spike) (Hassanein & Abdelmonem, 1997, 204):

- **Purpose of the test:** To measure the accuracy of reception.
- **Performance Specifications:** The mat is placed on a box at center (3). The tester stands at center (6). Another player, positioned at center (6) on the opposite half of the court, throws the ball to the tester, who passes it so that it lands on the mat. The player is given ten attempts.
- **Scoring:**
  - Four points if the ball lands inside the box or on the mat.
  - Three points if the ball touches the box.
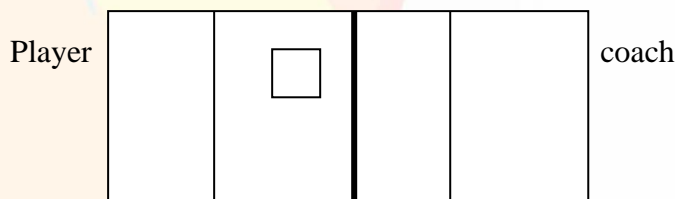 - One point if the ball lands inside the attack area.

Figure (6) (Accuracy of Reception from Thrown Balls (Power spike))

3-5 Preliminary Experiment:

This experiment was conducted on eight players from Al-Muqaddadiya Club on 17/12/2024. The following objectives were set for this experiment:

1. Organizing the workflow in terms of administrative procedures.
2. Assessing the suitability of the devices used in the tests and the skill level of the sample members.
3. Evaluating the effectiveness of the supporting team in executing the correct methods for the tests and their ability to accurately record results.
4. Determining the timing and location of the tests, as well as the total time from the start to the end of each test.

The researcher observed several points, including:

1. The suitability of the tests for the sample's level.
2. The distribution of the tests across days, starting from the most difficult to the easiest.

3-6 Final Execution of the Main Experiment:

The final execution of the main experiment for volleyball players participating in the Iraqi Premier League was carried out in their respective club training halls under study. The experiment commenced on **December 25, 2024**, and concluded on **February 26, 2025**. The process began with skill tests, followed by assessments using the **Reha COMM system** in the psychological laboratory of the **Center for Educational Studies and Psychological Research** at the **Presidency of the University of Baghdad (Jadriya).**

3-7 Statistical Tools:

The researcher used the SPSS statistical software package to process the data.

4- Presentation, Analysis, and Discussion of Results:

4-1 Presentation, Analysis, and Discussion of Control and Accuracy in Reception from the Power Serve and Defense from Court Position No. (4) for Volleyball Players:

4-1-1 Presentation of Results for Control and Accuracy in Reception from the Power Serve and Defense from Court Position No. (4) for Volleyball Players:

4-1-1-1 Presentation **of Descriptive Statistics for Control and Accuracy in Reception from the Power Serve and Defense from Court Position No. (4) for Volleyball Players, and Their Analysis and Discussion:**

Table (2) shows the descriptive statistics for control and accuracy in reception from the power serve and defense from court position No. (4) for volleyball players.

Variable	Test one	Test two	Test three
N (Valid)	42	42	42
Missing	0	0	0
Mean	55.4762	23.7381	69.3810
Std. Error of Mean	0.68605	0.40043	2.55189
Std. Deviation	4.44609	2.59511	16.53813
Skewness	0.707	0.637	-0.219

Table (2) suggests that the descriptive statistics for the side-related dependent variables, control variables, and volleyball defensive skills show noteworthy results. Based on the standard error (Kaos), these findings provide significant signs that aid in determining the normalcy of the research sample. In particular, the second measure of normalcy, the standard error, and all the mean values were higher than the standard deviation values. Finally, the skewness values varied from (± 1), indicating that the data distribution is normal.

4-1-1-2 **Presentation of Mean Values, Standard Deviations, Correlation Coefficients, and Their Error Ratios for Control and Reception Accuracy from the Powerful Serve and Court Defense from Position (4) for Volleyball Players:**

Table (3) shows the **simple correlation coefficient** and **error percentages** for **control**, **reception accuracy from powerful serve**, and **court defense from position number (4)** for volleyball players.

Variable	Mean	Std. Deviation	Pearson Correlation	Sig. (2-tailed)
Control	55.476	4.446		
Test one	23.738	2.595	-0.211	0.180
Test two	69.381	16.538	-0.137	0.389
Test three	27.190	5.549	0.413**	0.007

The descriptive statistics for the research sample and the straightforward correlation coefficients between control and the skill components of volleyball defensive strategies are clear from Table (3). Control and the ability to receive the serve were shown to be most correlated. The talent of accurately defending the court had the second-highest correlation, while the skill of receiving thrown balls (Power spike) came in third. Since the error rates were less than the significance level (0.05) with 38 degrees of freedom, all correlations were significant according to the correlation coefficient values.

4-1-1-3 Presentation of the contribution percentage of control in the accuracy of reception from the powerful serve and defense of the court from position number (4) for volleyball players.

Table (4) shows the contribution percentage of control in the accuracy of reception from the powerful serve and defense of the court from position number (4) for volleyball players.

Model	Partial Correlation	Coefficient of Determination	Standard Error of Estimate
1	**0.443**	**0.196**	**4.141**

Control and the precision of reception from the powerful serve and defense on the court for volleyball players contributed 0.196 percent of the total, as shown in Table (4). This is a low proportion in comparison to other elements, which contributed 0.81 percent. These elements could be psychological or physical.

4-1-1-4 Presentation of Multiple Correlation, Contribution Percentage, Standard Error, and Analysis of Variance for Multiple Regression to Test the Goodness of Fit of the Multiple Linear Regression Model Between Control and the Accuracy of Reception from the Powerful Serve and Court Defense from Position 4 for Volleyball Players:

Table (5) shows the multiple correlation coefficient, coefficient of determination, and standard error for estimating control and accuracy of reception from the powerful serve and defense on the court from position number (4) for volleyball players.

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	158.784	3	52.928	3.086	0.039
Residual	651.692	38	17.150		
Total	810.476	41			

a. Dependent Variable: Q1
b. Predictors: (Constant), C, B, A

With a value of (0.039), Table (5)'s multiple correlation coefficient between volleyball defensive skills and control was determined to be both acceptable and good. This suggests that the independent variable has an impact on the dependent variables.

The researcher employed the F-test to ascertain the significance of these coefficients. According to the findings, the computed F-value was 3.086, indicating statistical significance at a significance level below 0.05. This demonstrates even more how control affects volleyball defensive skill assessments.

The researcher employed the coefficient of alienation to evaluate the accuracy of the computed correlation coefficients and to comprehend how well one variable predicts another. This was accomplished by applying the following formula to determine the correlation coefficient's prediction index:

Prediction Index of Correlation Coefficient = 1 – Coefficient of Alienation

The results of using this formula showed a confidence level in these coefficients of (17.150%) for control over the defensive skill tests in volleyball.

4-1-1-5 Display of the constant and slope (effect) values for control and the accuracy of reception from the powerful serve and defense from position number (4) for volleyball players, their standard errors, true significance level, and the significance of the differences:

Table (6) shows the multiple correlation coefficient, the coefficient of determination, and the standard error for estimating control and the accuracy of reception from the powerful serve and defense from position number (4) for volleyball players.

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	55.182	8.807		6.266	0.000
Test one	-0.235	0.261	-0.137	-0.899	0.374
Test two	-0.030	0.040	-0.113	-0.761	0.451
Test three	0.294	0.122	0.367	2.412	0.021

a. Dependent Variable: Q1

Table (6) shows that, according to the T-value, which denotes significance at the 0.05 level, only the regression slope coefficients for the skill test variable are significant. This implies that there is a good chance of anticipating the mental elements involved in court defense. Since regression indicates the ability to predict the dependent variable when there exist values for the independent variable, the researcher employed the previously mentioned equation, also referred to as the linear regression equation. However, because their error % was greater than the significance level of 0.05, the other variables for the defensive technical skills had no effect.

4-1-2 Discussion of Results on Control and Reception Accuracy from Powerful Serves and Court Defense from Position 4 for Volleyball Players:

Table (3) makes it clear that control of defensive skills (court defense accuracy, reception accuracy from flung balls, and reception accuracy from serves) contributed significantly due to the statistical significance of the correlation. This implies that it is crucial to apply skills appropriately, considering their degree of difficulty. Control is used to help players develop their practical side in addition to adjusting and enhancing movements throughout skill performance.

"The ability to observe is linked to control, which necessitates the presence of brain capacity for regulation, control, and muscular coordination in carrying out actions. It is connected to the mental and motor processes of movement, which are necessary for the efficient and well-balanced performance of movements (Mahjoub, 1989, 12).

According to the study, volleyball calls for constant direction changes, quick position changes, team and individual deception strategies, and ball control in space. Furthermore, the intricacy of defensive technical skills and the range of offensive and defensive tactics make actual application a crucial and essential component of game mastery.

It is crucial to create a variety of tools and assistance, including colors, geometric forms, photographs, visual aids, and more, to help players with the technical aspects and raise their degree of control. "An individual who possesses control is sensitive to color, line, space, shape, floor, and the relationships between these elements, as well as the ability to visually perceive and imagine spatial ideas, thus directing themselves appropriately" (Armstrong, 2006, p. 20).

Regarding the role of control in defensive skills, the serve skills' reception came in second place according to the correlation coefficient. This indicates that the sample participants were able to guide the balls they received to locations where the setter is placed, so determining the ideal performance spot. The players' skills and preferences were taken into consideration when selecting the serve's reception. Furthermore, the players' control performance is improved since receipt from the serve is a closed skill with a specified context.

Players that possess good control may direct the ball to the setter or receive the serve to precise spots, giving them an edge when scoring points. The receiver "should be smart when directing the ball to where the setter of the receiving team is located" (Abbas et al., 2012, 94 considering this).

"As one of the six players on the team, the setter represents the team's 'thinking' brain and is responsible for taking over the game." They must have several traits that set them apart from other players, including modest height, agility, and jumping ability, since they are essential to the team's successful attacks (Hassan, 2004, 3-4).

The researcher also notes a difference in the level of control among the players based on their position in the backline (positions 1-5-6).

4-2 Presentation, Analysis, and Discussion of Results on Reaction Time and Reception Accuracy from Powerful Serves and Court Defense from Position 4 for Volleyball Players:

4-2-1 Presentation of Reaction Time and Reception Accuracy from Powerful Serves and Court Defense from Position 4 for Volleyball Players:

4-2-1-1 Descriptive Statistics of Reaction Time and Reception Accuracy from Powerful Serves and Court Defense from Position 4 for Volleyball Players and Their Analysis and Discussion:

Table (7) shows the statistical description of intelligence and defensive skills in volleyball.

Variable	Reaction	Test one	Test two	Test three
N (Valid)	42	42	42	42
Missing	0	0	0	0
Mean	57.1905	23.7381	69.3810	27.1905
Std. Error of Mean	0.89730	0.40043	2.55189	0.85624
Std. Deviation	5.81519	2.59511	16.53813	5.54906
Skewness	0.677	0.637	-0.219	0.737

The descriptive statistics for the dependent variables of volleyball defensive skills and the response speed variable are shown in Table (7). Based on the standard error (Kurtosis), we can deduce the sample's normalcy using several crucial factors. In addition to the standard error value, which serves as the second measure of normalcy, all the mean values were higher than the standard deviation values. Finally, the skewness coefficient values varied from (±1).

2-1-2 Presentation of the results for the means, standard deviations, correlation coefficients, and their error percentages for reaction speed, accuracy in receiving the serve, and defense skills from position four for volleyball players:

Table (8) shows the simple correlation coefficient and error percentages for reaction speed, accuracy in receiving the serve, and defense skills from position four for volleyball players.

Variable	Mean	Std. Deviation	Pearson Correlation	Sig. (2-tailed)
Control	57.190	5.815		
Test one	23.738	2.595	-0.212	0.179
Test two	69.381	16.538	-0.138	0.382
Test three	27.190	5.549	0.400**	0.009

According to Table (8), the descriptive statistics of the research sample and the simple correlation coefficient between defensive technical skills in volleyball and reaction speed indicate that the skill of receiving thrown balls had the highest correlation with reaction speed, followed by the skill of receiving serves, which came in second. Accurate court defense was the talent that ranked third. Since the error rate was below the significance level of 0.05 with 38 degrees of freedom, all correlations were considered significant.

4-2-1-3 Presentation of the contribution percentage of reaction time in the accuracy of reception from the serve, defense of the court from position (4) for volleyball players.

Table (9) shows the contribution percentage of reaction time in the accuracy of reception from the serve, defense of the court from position (4) for volleyball players.

Model	Partial Correlation	Coefficient of Determination	Standard Error of Estimate
1	0.433	0.187	5.446

Table (9) shows that, for volleyball players, the accuracy of reception from the serve and court defense from position (4) and reaction time have a 0.187 contribution percentage. This is a low percentage when

compared to other factors, which had 0.82 contribution percentages. These elements may consist of psychological or physical components.

4-2-1-4 Displaying the multiple correlation, coefficient of determination, standard error, and variance analysis of multiple regression to examine the fit of the multiple linear regression model between reaction time, accuracy of reception from the powerful serve, and court defense from position number (4) for volleyball players:

Table (10) shows the multiple correlation coefficient, coefficient of determination, and standard error for estimating reaction time, accuracy of reception from the powerful serve, and court defense from position number (4) for volleyball players.

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	259.358	3	86.453	2.915	0.047
Residual	1127.118	38	29.661		
Total	1386.476	41			

Table (10) shows that the multiple correlation coefficient between volleyball defensive technical skills and response speed was 0.047, which is deemed to be acceptable and at a proficient level. This shows that the independent variable has an impact on the dependent variables. The researcher employed the F-test to evaluate the significance of these coefficients. According to the findings, the computed F-value was 2.915, indicating statistical significance with an error level below 0.05. This offers more proof of how reaction time affects the volleyball defensive technical skills test.

The researcher employed the coefficient of alienation to evaluate the degree of confidence in the computed correlation coefficients or to ascertain whether one variable may predict another. The following formula was used to determine the prediction index for the computed correlation coefficient, which shows the percentage of confidence in the correlation coefficient:

Prediction index for the calculated correlation coefficient = 1 – coefficient of alienation.

The results of this calculation yielded a confidence percentage of (29.661%) for reaction speed in predicting the test of defensive technical skills in volleyball.

4-2-1-5 Presentation of constant and slope (effect) values for reaction time, reception accuracy from powerful serves, and court defense from position (4) in volleyball players, along with their standard errors, actual significance levels, and significance of differences:

Table (11) shows the multiple correlation coefficient, coefficient of determination, and standard error of estimation for reaction time, reception accuracy from powerful serves, and court defense from position (4) in volleyball players.

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Model	(Constant)	57.605	11.582	-	.000
First Test	-0.318	0.344	-0.142	-0.927	.360
Second Test	-0.041	0.053	-0.118	-0.786	.437

Third Test	0.368	0.160	0.352	2.301	.027

Based on the T-test value, which displays a significant level of (0.00), Table (11) indicates that only the regression slope coefficients for the variable "reaction time test" are statistically significant. This suggests a high likelihood of technical features being predicted. Regression is the capacity to predict a dependent variable when there exist values for the independent variable. The researcher employed the equation, also known as the linear regression equation. The error % was higher than the significance level (0.05), indicating that the other defensive technical skill-related variables had no discernible impact.

4-2-2 Discussion of the Results of Reaction Time, Reception Accuracy from Powerful Serves, and Court Defense from Position (4) for Volleyball Players:

It can be concluded from Table (9) that the contribution rate of reaction time to defensive skills (reception from serves, court defense, and reception from powerful serves) was statistically significant.

When it came to the relationship between these talents and response time, receiving strong serves came in first. "In sports, reaction time describes a person's capacity to act fast in a variety of circumstances. An athlete's capacity to compete at top levels of sports improves with their reaction speed (Hussein, 2009, p. 435).

Reaction time results often appear at the speed of response to situational variables and the ability to understand and apply tasks. "Reaction time level is an important criterion for predicting future athletic performance" (Al-Basati, 1998, p. 13).

Regarding the relationship between court defense and reaction time, it came in second. This makes sense because it is one of the hardest volleyball skills to master, demanding a variety of motor, mental, emotional, and physical demands. "Receiving a spike ball from the opponent or a block return and passing it from below to above, aiming to direct it to a teammate" is the definition of defense cited in Faraj (2011) on page 15.

According to the researcher, volleyball players' reaction times are focused on positioning themselves correctly on the court and assuming the proper stance in response to an opponent's strike. Furthermore, defensive placement against spikes with a single, double, or triple block is the first component of spatial ability. The second component is protecting the attacking player or the team's block. When establishing the team's block, it is also critical to position yourself correctly to fill up holes.

Court defense requires "leg strength, rapid movement response, the ability to extend body muscles quickly, experience, and training in taking appropriate positions on the court, in addition to performing the correct technique" (Author, 1987, p. 105).

As for reception from serves, it ranked last in terms of its correlation with reaction time. This ranking indicates that this skill requires high on-field experience and diverse abilities that the sample members could not fully achieve, especially when facing a serve or moving to the right position to get under the ball and direct it to the setter.

"Reception of serves is closely related to the type of serve used by the opposing team. Therefore, the receiver should already know the type of serve to allow for quick movement and accurate delivery to the setter" (Sakhi & Rizouqi, 2011, p. 43).

According to the researcher, receiving serves necessitates a very quick response time for several reasons, including the fact that fewer receivers are needed because of position specialization, which raises the spatial burden. The player then must cover the base players and the setter's opponent to cover as much of the court as they can. Furthermore, the reception skills have changed significantly from their previous state due to the force and pace of varied serves. In contemporary volleyball, pre-positioning and rapid lateral movements have become hallmarks of the skill, as high-speed serves no longer allow the player to roam freely about the court.

5. CONCLUSIONS AND RECOMMENDATIONS:

5-1 CONCLUSIONS:

After presenting and analyzing the results, the researcher reached the following conclusions:

- There is a meaningful relationship between the control index and the performance of defensive skills in volleyball players of premier league clubs.
- The contribution of control to the defensive skill tests in volleyball players of premier league clubs is (19%).
- There is a positive effect of control on the defensive skill tests in volleyball players of premier league clubs.
- There is a meaningful relationship between the reaction time index and the defensive skill tests in volleyball players of premier league clubs.
- The contribution of reaction time to the defensive skill tests in volleyball players of premier league clubs is (18%).
- There is a positive effect of reaction time on the defensive skill tests in volleyball players of premier league clubs.

5-2 Recommendations:

Based on the conclusions reached by the researcher, the following recommendations are made:

- Conduct a similar study focusing on psychological and functional aspects to contribute to the advancement and development of research and studies.
- Conduct a similar study for various levels that includes aspects from the current study.
- A predictive equation could be derived for other purposes to be used in evaluations.
- Develop standards and benchmark levels for the studied variables in this research.

SOURCES:

1. Amr Allah Ahmed Al-Basati; *Foundations and Principles of Sports Training and Its Applications* (Alexandria, Mena for Knowledge, 1998).
2. Eileen Wadieh Faraj; *Volleyball: A Guide for the Teacher, Coach, and Player, Volume 1, 2nd Edition* (Alexandria, Mena for Knowledge, 2011).
3. Hassan, M., et al.; *Technical Analysis of Volleyball Skills* (Cairo, Dar Al-Fikr Al-Arabi, 2020).
4. Hussein Sabehan Sakhi and Tarek Hassan Rzouqi; *Offensive and Defensive Skills and Tactics in Volleyball, 1st Edition* (Baghdad, Al-Kalimah Al-Taybah Printing, 2011).
5. Zaki Mohammad Mohammad Hassan; *The Playmaker in Volleyball* (Alexandria, Al-Maktabah Al-Masriyah for Printing, Publishing, and Distribution, 2004).
6. Zaitoun, A.; *Advanced Sports Training* (Amman, Dar Al-Masirah for Publishing, 2019).
7. Aqeel Al-Katib; *Individual Tactics and Techniques in Volleyball* (Baghdad, Higher Education Printing, 1987).
8. Qasim Hassan Hussein; *Comprehensive Sports and Physical Encyclopedia in Games, Events, and Sports Sciences, 2nd Edition* (Amman, Dar Al-Fikr, 2009).
9. Louay Ghanem Al-Sameedi and Nouri Ibrahim Al-Shouk; *Statistics and Tests in the Sports Field, 1st Edition* (Erbil, 2010).
10. Mohamed Sobhi Hassanain and Hamdi Abdel Moneim; *Scientific Foundations of Volleyball and Measurement Methods* (Cairo, Book Center for Publishing, 1997).
11. Najla Abbas (and others); *Basic Principles of Volleyball Skills and Methods of Learning Them* (Baghdad, Al-Mawil Printing, 2012).
12. Wajih Mahgoub; *Kinesiology, 2nd Edition* (Mosul, Dar Al-Kutub for Printing and Publishing, 1989).

13. Cox, R. H., Martens, R., & Russell, W. D. (2019). *Sports Psychology for Coaches.* Human Kinetics.
14. Kessel, J. (2017). *The Volleyball Coaching Bible, Volume.* Human Kinetics.
15. Palao, J. M., Santos, J. A., & Ureña, A. (2004). "Effect of Team Level on Skill Performance in Volleyball." *International Journal of Performance Analysis in Sport*, 4(2), 50-63.
16. Sheppard, J. M., & Young, W. B. (2006). "Agility Literature Review: Classifications, Training, and Testing." *Journal of Sports Sciences*, 24(9), 919-932.
17. Zatsiorsky, V. M., & Kraemer, W. J. (2006). *Science and Practice of Strength Training.* Human Kinetics.