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The effect of exercises according to the Tabata method to developing the skills of serving and receiving volleyball for students

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Abstract

The research challenge was: Standardized training based on solid scientific foundations is necessary for volleyball skill performance, since it is one of the academic curricula for students in the fourth stage. The researcher saw a discernible decline in the trainees' level of serving and receiving volleyball skills through his observation of the volleyball championship matches for the students of the University of Kufa's College of Physical Education and Sports Sciences, particularly the students in the fourth stage. Despite the trainers' usage of a variety of workouts, it was discovered that this stage's accomplishment fell short of expectations. It was observed that the majority of skill-training activities deviate greatly from Tabata method training, which affects the skill and works to heighten student suspense and excitement, which is reflected in achievement. This is where the research problem originated. In order to help students improve their serving and receiving volleyball skills and advance to higher levels and better match outcomes, the researcher opted to employ Tabata technique workouts. The research sought to: create training exercises using the Tabata method for volleyball; determine the impact of using the Tabata method for training students in serving and receiving the ball; and determine which approach was preferable in terms of effect between using the Tabata method and the coach's method for developing the performance of serving and receiving the ball. Regarding study technique and fieldwork, the investigator employed an experimental strategy, creating two equal groups and administering pre- and post-tests to them in order to solve the research topic. For the academic year 2023–2024, fourth-year students from the University of Kufa's College of Physical Education and Sports Sciences were determined to be the research population. With a size of twenty students, the researcher used a straightforward random lottery procedure to choose the primary research sample. As a result, the main research sample consisted of twenty students who were all taken. They were then split into two groups, experimental and control, using a simple random method (lottery), with ten players in each group. Four players were selected for the exploratory experiment from within the community of origin. The research sample's specifications are shown in table (1). The following were the key findings: Members of the experimental group saw an improvement in their performance of the abilities under examination as a result of the Tabata technique workouts.

Key Words: exercises, Tabata, developing, skills, volleyball

1. Introduction

1.1 Introducing the research

The search is still ongoing and ongoing in the fields of volleyball for methods and methods used for this in order to prepare and find the best exercises in order to serve the performance in the game of volleyball. Preparing exercises requires correct scientific foundations in training the skills of this game, so great attention must be paid to the training by following the scientific steps for the skills. Because it is considered the basis of any game, especially the game of volleyball, which requires high and standardized physical and skill preparation, as exercises according to the Tabata method perform physiological work for the muscles with their advantage of stretching. Muscle stretching is one of the most important features of human muscles, as it is the main and primary factor for performing movements if it is combined with exercises according to the Tabata method, because Volleyball skills move quickly between offensive skills and defensive skills, so it is possible that training is directed at lengthening the muscles only in order to increase the working range of the muscle, and this is not sufficient without there being an increase in the level of strength of these muscles, so the Tabata style exercises came from It can be complementary to other types of training.

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In addition, the game of volleyball has more skills that are related to flexing and extending the joints and the muscular work that accompanies it, including the skills of serving and receiving. The effective implementation of these skills requires the athlete to possess high physical capabilities. The purpose of the preparatory movements and capabilities is to achieve the main goal of the movement and thus serve. The skill aspect of it, and achieving the required purpose of the skill, so training these muscles must take a large amount of space and according to scientific foundations that are consistent with the conditions of the skills.

The progress in the level of volleyball witnessed in the last decade of the twentieth century came as a result of progress in the training process and raising the level of training according to the Tabata method for each exercise and the preparation of coaches technically and practically, which must keep pace with the features of this game that requires different fast stances and performance ability throughout the match.

1.2. Research Problem

One of the academic programs offered to fourth-stage students is volleyball, which demands standardized training based on reliable scientific principles for skill performance. The researcher noticed a noticeable decline in the students' volleyball sending and receiving skills through his observation of the volleyball championship matches for the students of the University of Kufa's College of Physical Education and Sports Sciences, particularly the fourth-stage students. Despite the trainers' use of various exercises, the stage's achievement fell short of expectations. It was observed that the majority of skill-training activities deviate greatly from Tabata method training, which affects the skill and works to heighten student suspense and excitement, which is reflected in achievement. This is where the research problem originated. The researcher made the decision to employ Tabata technique workouts to help pupils improve their serving and receiving skills so they may compete at higher levels and produce impressive outcomes.

1.3. Research objective

1. Preparing exercises according to the Tabata method for volleyball.
2. Identify the effect of training according to the Tabata method in developing the serve and receiving in volleyball for students.
3. Identifying the preference in effect between exercises according to the Tabata method and the method used by the coach in developing the students' volleyball serving and receiving performance.

1.4. Research hypotheses

1. There is a statistically significant effect of training according to the Tabata method in developing the skills of serving and receiving volleyball for students in the research sample.

1.5 Research Feilds

1.5.1 Human field: Fourth stage students in the College of Physical Education and Sports Sciences - University of Kufa for the academic year 2023-2024.

1.5.2 Time field: - From 20/9/2023 to 5/12/2023.

1.5.3 Spatial field: The indoor sports hall of the College of Physical Education and Sports Sciences, University of Kufa.

2. Research methodology and field procedures

2.1 Research methodology

Since the approach used depends on the nature of the problem, the researcher employed the experimental technique, which is regarded as "the closest and most accurate solution to many scientific problems practically and theoretically," by creating two equal groups and administering pre- and post-tests to each. (Allawi, Muhammad Hassan & Rateb, Osama Kamel, 1999, p. 217)^[1] and figure (1) depicts the two study groups' experimental designs.

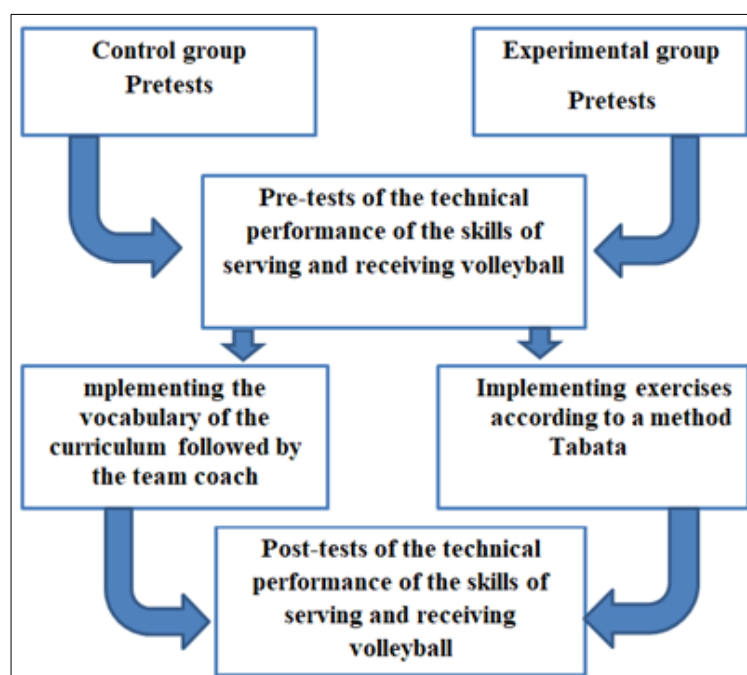


Fig 1: Explains the experimental design of the two research groups

2.2 The research community and its sample: “The goals that the researcher sets and the procedures that he uses are what determine the nature of the population or sample that he chooses” (Raysan Majeed Khuraibit, 1988, p. 41). The research population was identified as fourth-year students in the College of Physical Education and Sports Sciences at the University of Kufa for the 2023 academic season. -2024, numbering (68) students. Using the lottery approach, which uses simple random selection, the researcher selected the primary research sample, which consisted of twenty students. As a result, the whole sample size for the primary research was reduced to (20) students. After being enrolled, they were split into two groups using the basic random method: the control group and the experimental group. Ten players from each group participated in the lottery, and four players from the community of origin were selected for the exploratory experiment.

Table 1: Results demonstrate that the skewness coefficient values are less than (± 1), indicating that the study population sample is homogeneous across all variables.

Variables	Measurement unit	Mean	Std. Deviation	Median	Skew ness	Result
Length	Cm	185.25	6.72	183.5	0.78	Homogeneous
Mass	Kg	77.92	9.34	77.5	0.13	Homogeneous
Age	Year	22.92	1.44	23	-0.166	Homogeneous
Training age	Year	6.25	1.53	6.5	-0.49	Homogeneous

2.3 Research tools and devices used

2.3.1 Methods of data collection

- Note
- Personal interviews.
- Tests and measurement.
- Arab and foreign sources and references.
- International Information Network (Internet).

2.3.2 Tools and devices used in research

- The volleyball court is legal.
- Japanese-made Casio camera with accessories.
- One (1) HP laptop computer, made in China.
- (7) legal volleyballs, type (Mikasa).
- Colored adhesive tape (9).
- Metal tape measure (10 meters), number (1).
- Chinese-origin electronic stopwatch (3).
- (1) Chinese-made electronic device for measuring length and mass.
- Colored plastic signs (6), each color (1).
- Funnels (3).
- Japanese-made CASIO calculator (1).
- CDs (5).
- (1) Chinese-made fox whistle.
- Office tools (paper and pens).

2.4 Field research procedures

2.4.1 Determining grades to evaluate the technical performance of the skills of serving from above (tennis) and receiving the serve in volleyball

The researcher relied on previous studies in selecting tests to evaluate the technical performance of the two skills of serving from above (tennis) and receiving serves, in which the reliance was on the apparent structure of the skill in the evaluation process and according to the three sections of the skill, which are:

1- Preparatory section. 2- The main section. 3- Final section.

2.2.1 Sample homogeneity

Some variables that represent the sample specifications were identified for the purpose of ensuring their homogeneity in those variables that are considered influential in the experiment results and which must be controlled before beginning the research, relying on the statistical function, in order to experimentally control the research procedures and avoid influences that may affect the students' research results. The sample will be regularly distributed and homogenous if the skewness coefficient value, which is one of the markers of the normal distribution of these variables, is kept within the bounds of (± 1). Table (2) illustrates this. The homogeneity of the research sample and the skewness coefficient value for the variables (length, mass, age, and training age) are displayed in Table 1.

Note that the final grade for the evaluation is (10) marks and the divisions were as follows:

- Dividing the technical performance assessment test for the skill of serving from above (tennis): the preparatory section is given (3) marks, the main section (5) marks, and the final section (2) marks.
- Dividing the technical performance evaluation test for the skill of receiving the serving from below by awarding the preparatory section (3) marks, the main section (5) marks, and the final section (2) marks.

2.4.1.1 Testing the skill of serving from above (tennis) with volleyball

2.4.1.1.1 A test that evaluates the technical performance of the overhead serving skill (tennis) in volleyball

- **Objective of the test:** To assess the overhead serve skill in tennis by looking at its apparent shape and its three parts (main, preparation, and final).
- **Tools used:** A legal volleyball court, (3) legal volleyballs, an evaluation form.
- **Performance specifications:** The tested player performs the skill of serving from above (tennis) from the serving area specified at (9) m, provided that the ball crosses the net to the opposite court.

Registration

After receiving CDs with a picture of the testers' technical performance, three evaluators assess each tested player's three attempts and assign three marks to each one, noting that the final evaluation score for each attempt is (10) marks divided among the three skill sections, which are (3). grades for the preparation segment, the major section (five grades), and the final section (two grades). Next, you select the best rating for each component. The final grade for each tested player is then determined by taking the mean of the top three grades, as seen in Figure (2).

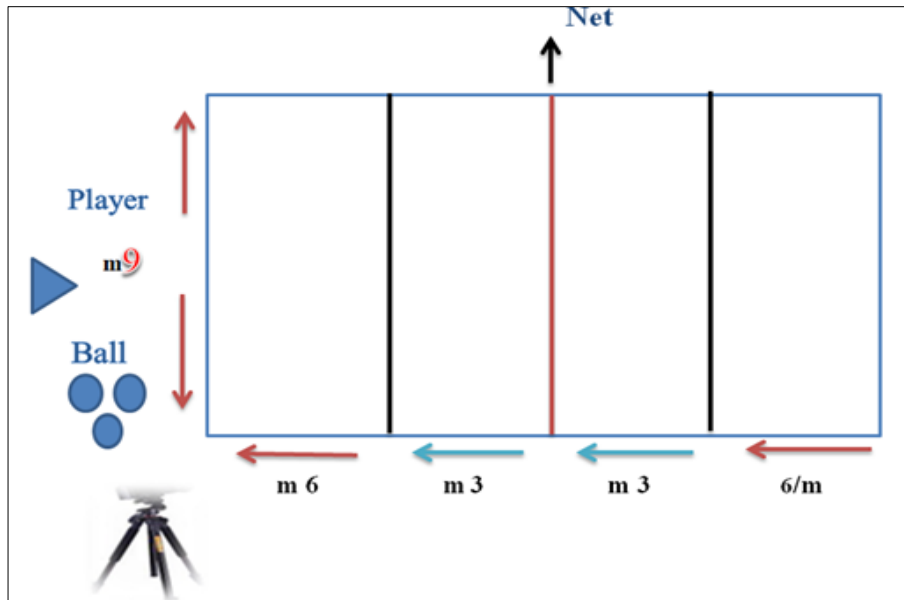


Fig 2: Demonstrates how the technical performance of the volleyball overhead serving talent (tennis) is evaluated.

2.4.1.2 Testing the skill of receiving the serving with a volleyball.

2.4.1.2.1 Test to evaluate the technical performance of the skill of receiving the serve in volleyball

The aim of the test: to assess the serving receiving skill's technical performance in each of its three sections—the preparation, main, and final its virtual form.

Tools used: A legal volleyball court, (3) legal volleyballs, and an evaluation form. Appendix No. (8).

Performance specifications

In order for the instructor to toss the ball to the tested student from position (3), the student must demonstrate the ability to receive the serve from below from position (6). The student then attempts to deliver the ball to the teacher with his forearms.

Performance conditions

Each player has three consecutive attempts.

Registration

After giving them CDs with a picture of the testers' technical performance, three assessors assess each tested player's three attempts and assign three marks to each, keeping in mind that each score is ultimately calculated as (10) marks divided among the three skill sections, or (3) marks. The best score for each component is then selected, with five marks for the preliminary phase, two marks for the main segment, and three marks for the final section. The final score for each tested player is then determined by taking the arithmetic mean of the three best scores. As seen in Figure (3).

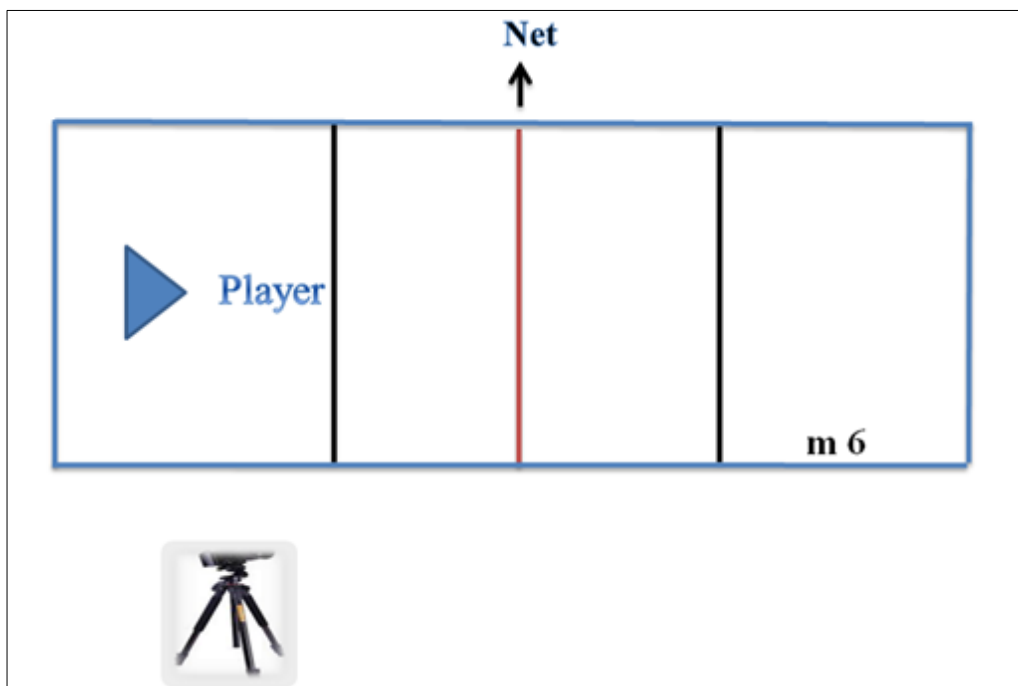


Fig 3: Displays the technical performance assessment of the serving receiving skill

2.4.2 Exploratory experience

For the purpose of revealing the obstacles that the researcher may face while carrying out the main experiment, as well as to identify the suitability of the devices used and their testing, and to know the negative aspects that the work will face, the researcher conducted a reconnaissance experiment on Wednesday, 27/9/2023, at exactly eleven o'clock in the morning, on a sample consisting of (4) Players in the closed hall at the College of Physical Education and Sports Sciences / University of Kufa.

2.4.3 The main experience

2.4.3.1 Pre-test

The researcher, with the help of the assistant work staff, conducted the pre-test of the skills of serving and receiving with a volleyball on the two research groups (control and experimental) on Wednesday, 4/10/2023, at twelve noon in the indoor hall of the College of Physical Education and Sports Sciences / University of Kufa, and the tests were filmed. Skill.

2.4.3.2 Training curriculum

The researcher prepared training according to the Tabata method after discussing the priorities for how to implement

them and their suitability to the level of the sample. Through personal interviews with experts and specialists, the researcher prepared training units according to the Tabata method for the skills of serving and receiving volleyball to achieve the purposes and objectives of the training process.

24.3.3 Post-test

To ascertain the degree to which training using the Tabata method had an impact, the researcher held a post-test for volleyball serving and receiving skills on Monday 4/12/2023, at noon in the College of Physical Education and Sports Sciences / University of Kufa's indoor hall.

2.5 Statistical methods

The Statistical Portfolio for the Social Sciences (SPSS) was used.

3. Presentation, analysis and discussion of the results

3.1 Presentation and discussion of the results of the experimental group

3.1.1 Displaying the results (skill tests related to the serving skill) for the two tests

Pre and post for the (experimental) group and discussed.

Table 2: Shows the significance of the differences between the pre-test and post-test of the experimental group in the skill tests of the serving skill.

Variables	Pre-test		Post-test		t value Calculated	Sig level	Sig type	Development percentage
	Mean	Std. Deviation	Mean	Std. Deviation				
Technical performance of the serving skill	5.540	0.353	8.219	0.380	23.93	0.000	Sig	%35.25

Significant because the Sig value $\geq(0.05)$

Discussion of the results of Table (2)

In light of the data extracted in Table (2) for individuals in the research sample, differences were shown in the values of the skill tests when performing the transmission skill for the pre- and post-tests of the (experimental) group. The results showed that there were significant differences in favor of the post-test for the test (technical performance of the transmission skill). This is attributed The researcher attributed this development to the nature of the skills-like exercises and the effectiveness of the exercises according to the Tabata method, which focused on the development of skills so that the skill is performed correctly. The researcher finds that the results of the variables and their significance are clearly reflected in the result of the judges' opinions. Also, diversity, change, repetition, progression, and repetition are principles that help with these differences, and because the benefit of training according to the Tabata method allowed for giving good interim measurements of

the development of skill that has been achieved, and it is better for these measurements to be in Competitive frameworks are therefore very compatible with most sports and the training contexts enable the successful pursuit of achieving the goal of performance. This makes the players very confident, fully appreciative, and work hard and thus perform better (King, R. B., Ganotice, F. A., & Watkins, D. A., 2014, p.453) ^[2]. The researcher added that it is better not to limit the competition to the measurements included in the training objectives, but it is preferable to include feedback during the training as well because it is a motivating and effective factor that always puts the trainee in an interactive framework and raises their psychological barriers to any decline in performance.

3.1.2 Presenting and discussing the results of (skill tests related to receiving skill) of the pre- and post-tests of the (experimental) group

Table 3: Shows the significance of the differences between the pre-test and post-test for the experimental group in the skill tests of the receiving skill

Variables	Pre-test		Post-test		t value Calculated	Sig level	Sig type	Development percentage
	Mean	Std. Deviation	Mean	Std. Deviation				
Technical performance of the receiving skill	4.794	0.409	7.960	0.18	26.460	0.000	Sig	%24.71

Discussion of the results of Table (3)

The researcher observes this development occurring in the application of training according to the Tabata method, which focused on the development and verification of technical performance, based on the results presented in Table (3), which show that there are significant differences between the pre- and post-tests of the experimental group

and in favor of the post-test in the test (technical performance of the receiving skill). For the receiving skill so that the skill is performed in a standardized manner and according to the correct scientific curriculum, which is compatible with the training levels of the trainee, taking into account the components of the training load. The researcher attributes the reason for this to his use of exercises

according to the Tabata method prepared by the researcher, as they were codified according to sound scientific principles that suit the students' capabilities. The researcher believes that his exercises helped in developing the skill of receiving the volleyball for the experimental group. Al-Hila, "The training tools work to achieve communication." Transferring the training objectives from the coach to the player increases the effectiveness and development of the training process, motivates students to participate more in many training situations, and works to excite them to participate in many training sessions and continue in them. It also facilitates the process of remembering by recalling information" (Al-Hila, Muhammad Mahmoud, (2001, p. 30)^[3], this helps to gain a kind of fixation of the kinetic

software in the minds of the students as a result of the time that the program takes, which led to the beginnings of gaining a kind of experience, and this is an important matter in developing the students' level. (Liba) (Liba, marie R., 1971, p.172)^[4] and (Mohr) (Mohr D. R., 1960, p.321)^[5] mention that "training exercises for limited times work." "...to improve performance and that experience is directly proportional to accuracy".

3.2 Presentation and discussion of the results for the control group

3.2.1 Presenting the results (of the skill tests related to the serving skill) of the pre- and post-tests for the (control) group and discussing them

Table 4: Shows the significance of the differences between the pre-test and post-test for the control group in the skill tests of the serving skill.

Variables	Pre-test		Post-test		t value Calculated	Sig level	Sig type	Development percentage
	Mean	Std. Deviation	Mean	Std. Deviation				
Technical performance of the serving skill	5.270	0.340	7.312	0.449	15.80	0.000	Sig	%18.61

Discussion of the results of Table (4)

By presenting the results of the skill tests related to the transmission skill shown in Table (4), where a t-test was used, the results showed that there were significant differences between the pre- and post-tests for the control group and in favor of the post-test for the test (technical performance of the transmission skill). The researcher noted that the reason for the significant difference for the members

of the control group is due to the methods and methods that were applied and used by the trainer, which had a positive impact on these variables among the members of the control group.

3-2-2 Presenting and discussing the results of (skill tests related to receiving skill) of the pre- and post-tests for the (control) group

Table 5: Shows the significance of the differences between the pre-test and post-test for the control group in the skill tests of the receiving skill

Variables	Pre-test		Post-test		t value Calculated	Sig level	Sig type	Development percentage
	Mean	Std. Deviation	Mean	Std. Deviation				
Technical performance of the receiving skill	4.650	0.311	7.47	0.313	33.650	0.000	Sig	%12.57

Discussion of the results of Table (5)

Through the results of the receiving skill that were presented and shown in Table (5), where the t-test was used, it showed that there were significant differences between the pre- and post-tests of the control group and in favor of the post-test of the test (technical performance of the receiving skill). The group members, according to the study, are the cause of the notable discrepancy. The trainer's curriculum and the training techniques it included, together with the impact of a

few scientific lectures that aided in the pupils' growth, are what give rise to the control.

3.3 Presenting and discussing the results of the post-tests for the experimental and control groups

3.3.1 Presenting the results (of the skill tests related to the serving skill) of the two post-tests for the two groups (experimental and control) and discussing them

Table 6: Shows the significance of the differences between the post-test of the control and experimental group in the skill tests of the serving skill.

Variables	Experimental Post-test		Control Post-test		t value Calculated	Sig level	Sig type
	Mean	Std. Deviation	Mean	Std. Deviation			
Technical performance of the serving skill	8.215	0.340	7.310	0.445	6.094	0.000	Sig

Discussion of the results of Table (6)

Through the results presented for the skill tests for the serving skill in Table (6), a t-test was used. There is superiority for the post-tests that the results showed, as there are significant differences in favor of the post-test for the experimental group to test (the technical performance of the serving skill) between the two groups. Experimental and control in the post-test and in favor of the experimental group. The researcher attributes this development to the effectiveness of the training according to the Tabata method, which works to enhance this skill so that the skill performance is in the correct manner, as the training

according to the Tabata method contributed greatly to the development of the skills, as it was suitable for the skill because it is close and similar to it. Following the steps for implementing exercises according to the Tabata method after explanation and training on the skill and constantly providing students with feedback increases the students' motivation and their ability to achieve skill performance, and their independence in making decisions about their performance. Training according to the Tabata method also has a direct impact on developing technical performance as well as increasing the ability of the trainees. On interpreting information, Iván González emphasizes that "the player's

possession of a wide field of vision is more capable of interpreting and perceiving the information and giving the required motor response with accuracy and high quality” (Iván González García& Luis Casáis Martínez, 2011,p127) ^[6].

Table 7: Shows the significance of the differences between the posttest of the experimental and control group in the skill tests of the receiving skill

Variables	Experimental Post-test		Control Post-test		t value Calculated	Sig level	Sig type
	Mean	Std. Deviation	Mean	Std. Deviation			
Technical performance of the receiving skill	7.955	0.18	7.430	0.305	5.556	0.00	Sig

4. Discussion of the results of Table (7)

Based on the results of the receiving skill that were presented in Table (7), a t-test was used, where the results showed that there were significant differences in favor of the post-test for the experimental group for the test (technical performance of the receiving skill) between the two groups in the post-test and in favor of the experimental group. According to the researcher, using Tabata method exercises in a training unit forces the trainees to respond to multiple variables while completing the exercises, which improves the trainees' capacity to categorize their technical and skill performances into distinct variables. He concurs with (Al-Zamili) that practicing skills in the presence of many workouts results in automatic performance until the execution resembles competition and the nervous system is free to concentrate on other stimuli (Al-Zamili, Muhammad Ali Hussein Hashem, 2011, p. 18) ^[7]. Enthusiasm, excitement, and regular training are essential factors that enable the sample to excel and raise the level of skill achievement, and this leads to the implementation of motor duties with high precision and efficiency. In addition to improving the trainee's ability to behave during a performance, these trainings assisted them in adopting the proper posture for it. A player will receive a higher performance score if they are well-matched and have total control over the stimuli while performing. These units were implemented scientifically, which created a state of parity between the training load and the player's development, which was reflected in the level of performance, as well as the state of repetition and focus on correcting errors accompanying the performance, which gave the trainees accuracy in the skills (serving and receiving) through estimating the distance and direction of the ball. Also, a large percentage of the training is similar to the competition situation. Taking into account continuous repetition, as well as the gradation in difficulty levels, which ensures performance by all, organized and continuous training gives positive results in enhancing the goal of training, and this is confirmed by (Ahmed Youssef) “rationalizing the intensity, size and density of training loads in special training units To develop performance endurance, we must place an effective training load on the muscles and vital systems, ensuring that students perform under the influence of an appropriate level of fatigue, which is necessary for developing personal endurance. (Miteb, Ahmed Youssef, 2003, p.73) ^[8].

5. Conclusions and recommendations

5.1 Conclusions

1. The exercises according to the Tabata method contributed to improving the skill performance of the skills under study to the better for the members of the experimental group.

3.3.2 Presenting and discussing the results of (skill tests related to receiving skill) for the two post-tests for the two groups (experimental and control)

2. In light of the results, the experimental group developed quickly and with less effort as a result of using exercises according to the Tabata method.
3. The duration of the training to which members of the research sample were subjected was sufficient to produce an impact on the variables (serving skill, receiving skill) for members of the experimental group.
4. The development of the members of the experimental group at the expense of the members of the control group in the skills (serving and receiving)

5.2 Recommendations

1. The researcher recommends the necessity of using exercises according to the Tabata method within the training curriculum to save effort and save time, as well as to achieve good results in the training process.
2. The researcher recommends the necessity of using exercises according to the Tabata method to develop the skills of serving and receiving and other skills in volleyball.
3. The researcher recommends the necessity of conducting other studies in which exercises are used according to the Tabata method to train the basic skills for the rest of the games.
4. Great interest in developing the skills of serving and receiving because of their great importance in deciding many matches.

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