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The effect of some educational exercises in developing motor coordination and learning the skill of preparing in volleyball for female students

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Abstract
The importance of the research lies in preparing some educational exercises and knowing their effect on coordination, motor flexibility, and learning the skill of preparing in volleyball for female students.
The research problem focused on the fact that most students face slowness in learning motor skills, especially in the preparation skill, because it is one of the skills that require high motor coordination, and therefore they need a long time to learn this skill and master it correctly in terms of accuracy, fluidity and proper timing. The researchers believe that the reason for this is the lack of use of trainers for various educational exercises and their limitation to a specific type of exercises, which makes learning the preparation skill require a long time.
The research aimed to prepare some educational exercises to develop motor coordination and learn the skill of preparing in volleyball for female students, as well as to identify the effect of some educational exercises in developing motor coordination and learning the skill of preparing in volleyball for female students. The research hypothesis was that there is an effect in educational exercises in developing motor coordination and learning the skill of preparing in volleyball for female students.
As for the research methodology and field procedures, the researchers used the experimental method to solve the research problem, while the research community was determined as the students of the University of Kufa volleyball team, numbering (18) students, and they were distributed equally into two groups (Experimental and control) using a simple random method (lottery).
The researchers reached several conclusions, the most important of which was that some educational exercises helped develop the motor coordination of the legs and arms of the experimental group, as well as some educational exercises helped learn the technical performance of the skill of preparing in volleyball for the experimental group.
As for the most important recommendations, they included the following: The researchers recommend paying attention to and relying on the use of some educational exercises according to the level of students in learning the skill of preparing in volleyball.

Keywords: Ducational exercises, motor coordination, motor flexibility, volleyball preparation skill

Introduction
Definition of the research
Introduction to the research and its importance
Motor learning in recent years has been making great scientific and technical progress, as the learning process requires the use of the best educational programs and their correct implementation so that the goal in the educational process can be reached in the fastest time and with the least effort. The development in the technical level of the types of games and sports activities in general at the present time did not come by chance, but rather as a result of the follow-up of those interested, specialists and researchers in developing the educational process on an ongoing basis in order to raise the level of skill performance and achieve results. Physical and sports education is one of the important fields in developing skill performance and preparing learners physically and professionally and helping them communicate with society and the world, The educational unit is the basic foundation of the curriculum, as it helps the learner acquire basic motor skills and develop his motor performance and provides him with educational experiences to practice sports activities through different educational methods, which are one of the components that any educational curriculum needs.

It is the duty of the trainer or teacher to be fully familiar with its organization and the rules necessary for its practice. Accordingly, these must think about the educational curriculum that he wants to use or introduce into the educational unit, as the educational material (Motor skill), the specific goals and the characteristics of the learners are what determine the appropriate and effective curriculum for the success of the educational process that is achieved through the interaction between the trainer or teacher and the player or learner and the educational process. The more successful the teacher is in choosing the optimal educational method, the more successful the learning process will be and lead to positive results. Educational exercises take into account the needs and requirements of all learners when designing the educational unit, its materials and goals. Through these exercises, the teacher tries to avoid all obstacles that prevent any learner from learning effectively while maintaining the high level of the requirements of the educational curriculum.

One of the sports that has received more attention and development is volleyball, which is one of the team games that has spread widely in various countries of the world. This game is characterized by the fact that it includes several offensive and defensive skills as necessary requirements for optimal performance, which learners must learn, master, and be familiar with all its technical and tactical aspects. One of the important skills that requires a lot of time while learning it is the preparation skill because it is an important skill and consists of technical stages through which the learner can excel in performing it in formulas and images that suit his special abilities that he possesses and that distinguish him from his peers. This skill is one of the skills that help the team decide matches, as good preparation contributes to the success of the most difficult skill, which is preparation with the ball, and the success of the preparation skill with the ball will lead to the team's success in obtaining points and winning the match. Hence, the importance of research in finding educational development exercises to learn the skill of preparation with the ball as well as developing motor coordination.

Research problem

Through the field experience of the researchers, they noticed that there is a large number of female students or learners who face slowness in learning motor skills, especially in the preparation skill, because it is one of the skills that require high motor coordination and is performed in multiple forms during the match, and therefore they need a long time to learn this skill and master it correctly in terms of accuracy, fluidity and proper timing. The researchers believe that the reason for this is the lack of use of educational exercises by teachers and their limitation to a specific type of exercises, which makes learning the preparation skill require a long time, so the researchers decided to prepare educational exercises with the aim of trying to learn the preparation skill in volleyball quickly, as well as developing motor coordination, so the researchers agreed to undertake this experiment.

Research objectives

1. Preparing some educational exercises to develop motor coordination and learn the skill of preparing in volleyball for female students.
2. Identifying the effect of some educational exercises in developing motor coordination for female students.
3. Identifying the effect of some educational exercises in learning the skill of preparing in volleyball for female students.

Research hypotheses

1. There is an effect of some educational exercises in developing the motor coordination of female students.
2. There is an effect of some educational exercises in learning the skill of preparation in volleyball for female students.

Research area

1. **Human field:** Volleyball players of the University of Kufa team.
2. **Temporal field:** From 10/1/2024 to 11/25/2024.
3. **Spatial field:** The large sports hall in the College of Physical Education and Sports Sciences, University of Kufa.

Research methodology and field procedures

Research methodology

The researchers followed the experimental method because it is compatible with the nature of the research problem. The design of the two equivalent groups (experimental and control) with pre- and post-tests was also chosen.

Research community and sample

The research community represents the players of the University of Kufa team, numbering (18) students, and they were distributed equally into two groups (Experimental and control) using the simple random method (Lottery).

Equivalence of the two research groups

Before starting to implement the educational exercises, the researchers resorted to verifying the equivalence of the two research groups in the variables related to the motor and skill tests, which are (Motor coordination, technical performance of the volleyball preparation skill), as shown in Table (1).

Table 1: Shows the equivalence of the two research groups in the motor and skill tests (coordination, volleyball preparation skill)

Type of indication	Test significance level Sig	Calculated value of (t)	Control group		Experimental group		Unit of measure	Variables
			Standard deviation	Arithmetic mean	Standard deviation	Arithmetic mean		
Unpositive	0.916	0.11	0.26	10.98	0.63	11.12	Second	Eye-leg coordination
Unpositive	0.839	0.21	0.75	9.55	0.93	9.87	Degree	Eye-arm coordination
Unpositive	0.876	0.16	0.31	4.78	0.44	4.80	Degree	Technical performance of the preparation skill in volleyball

From Table (1), it is clear to us that the value of the test significance level (sig) is the largest value of the significance level (0.05), and for all variables under study, therefore, the test significance is not significant.

Methods, tools and devices used

Methods of collecting information: The researchers used the following methods

- Arabic and foreign sources and references.
- Personal interviews.
- Observation.
- Testing and measurement.

Tools and devices used: The researchers used the following tools and devices

- Legal volleyball court.
- Legal volleyball balls, number (15) (Mikasa).
- Measuring tape (20 meters).
- Colored plastic cones, number (10).
- Rings with a diameter of (50) cm, number (8).
- Sports stopwatch, number (2).
- Whistle, number (2).
- Office supplies (papers and pens).
- Canon type camera, number (2) with supports.
- Lenovo type laptop calculator, number (1).
- Chinese-made electronic device for measuring height and weight.

Field research procedures

Determining the variables tests

Motor coordination test

First: Numbered circles test (1)

- **Purpose of the test:** To measure the motor coordination between the eyes and the legs.
- **Tools:** Stopwatch, draw (8) circles on the ground, each with a diameter of (60) cm, and number the circles from (1 to 8) as in Figure (1).
- **Description of the performance:** The tested student stands inside circle (1) and upon hearing the start signal, she jumps according to circle (2) then (3) until the end of circle (8), and the jump is with both legs together.
- **Recording:** The time taken by the tested student to move through the eight circles is recorded in seconds, as shown in Figure (1).

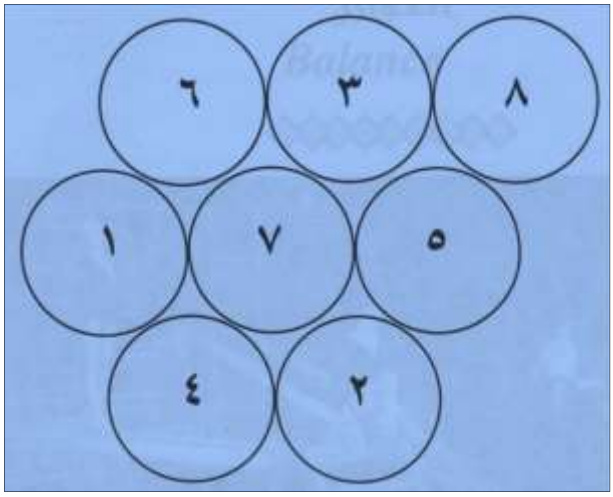

Fig 1: Illustrating the numbered circles test to measure eye-leg coordination

Third: Throwing and receiving the ball on the wall test (2)

- **Purpose of the test:** To measure the motor coordination between the eye and the arm.
- **Tools:** Tennis ball, wall, draw a line 5 m from the wall.
- **Description of performance:** The test subject stands in front of the wall and behind the line drawn on the ground where the test is conducted according to the following sequence:

1. Throwing the tennis ball five times in a row with the right hand, so that the test subject receives the ball after it bounces off the wall with the same hand.
2. Throwing the tennis ball five times in a row with the left hand, so that the test subject receives the ball after it bounces off the wall with the same hand.
3. Throwing the tennis ball five times in a row with the right hand, so that the test subject receives it after it bounces off the wall with the left hand.

- **Recording:** For each correct attempt, a score is calculated for the test subject and the final score is out of (15) points.

Technical performance evaluation test for the preparation skill in volleyball

- **The aim of the test:** Evaluating the technical performance (Technique) of the preparation skill through the three sections of the skill (Preparatory, main, final).
- **Tools used:** A legal volleyball court, (3) volleyballs, a pre-prepared evaluation form.
- **Performance method:** The tested student performs the preparation skill in the designated area for preparation, i.e. from center (3), trying to perform the preparation skill correctly for three attempts, provided that the ball and the student's body do not touch the net, or cross the opponent's court, as shown in Figure (3) below.
- **Registration:** Three evaluators evaluate the three attempts of each laboratory student, and three marks are awarded for each evaluator, noting that the final evaluation mark for each attempt is (10) marks, divided into the three skill sections, which are (3) marks for the preparatory section, (5) marks for the main section, and (2) marks for the final section. After that, the best mark is chosen for each evaluator, and by extracting the arithmetic mean of the best three marks, the final mark is extracted for each laboratory student, as shown in Figure (2).

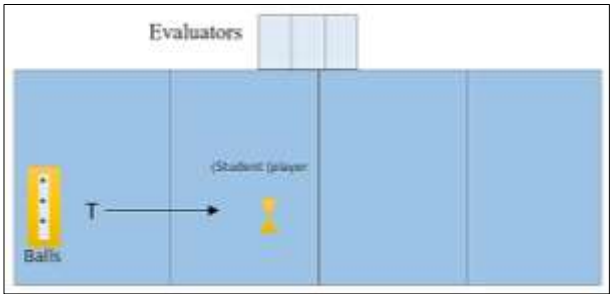

Fig 2: Illustrating the evaluation of the technical performance (Technique) of the preparation skill in volleyball

Exploratory experiment

The researchers conducted an exploratory experiment for tests (motor coordination and technical performance of the volleyball preparation skill) on a sample of the original research community with a number of (5) female students

and with the help of the auxiliary work team on Thursday 10/3/2024. The exploratory experiment aims to:

1. Verify the suitability of the tests for the sample members and the ease of their application.
2. Verify the validity of the devices and tools used in the research.
3. Identify the time required to implement the tests.
4. Verify the understanding of the auxiliary work team and their efficiency in conducting measurements and tests and recording the results.
5. Identify the time required for the exercises and the number of repetitions.

Main Experiment Procedures

Pre-tests

The researchers conducted pre-tests on the research community for the two groups (Control and experimental) for the study variables (Technical performance of the preparation skill, motor coordination) on 10/6/2024, at ten o'clock in the morning. The researchers used two Canon cameras to photograph the technical performance of the preparation skill in volleyball and record it manually via (CD) to present it to the evaluators (*) to analyze it and record the results of their evaluation of the technical performance through the evaluation form that was prepared for this in advance.

Implementation of the educational exercises

The researchers prepared and organized some educational exercises based on the opinions of experts and specialists in volleyball and personal experience. The educational exercises were applied to the experimental group on Wednesday 10/9/20240 until Sunday 11/3/2024.

The educational exercises helped the learners to raise their skill and motor abilities, as these exercises were appropriate for their ages and characteristics in terms of their abilities and previous experiences.

The details of the educational exercises are as follows

1. The duration of implementing the educational exercises is (4) weeks.
2. The number of educational units per week is two educational units on Sunday and Wednesday of each week.
3. The total number of educational units is (8).
4. The duration of the educational unit is (90) minutes.
5. The duration of the main section of the educational unit is (60) minutes.
6. The researchers took into account the following when developing the educational exercises

a) Diversifying the educational exercises to prevent boredom and weariness that may affect the members of the experimental group.

b) Graduating from easy to difficult in implementing the educational exercises.

Post-tests

After completing the implementation of the educational exercises, the post-tests were conducted on the control and experimental groups. This was on Wednesday (11/6/2024), as the researchers took into account the same conditions in which the pre-tests were conducted in terms of the sequence of tests.

Statistical methods used

The researchers used the statistical package (SPSS) to analyze the research results, including

- Arithmetic mean.
- Standard deviation.
- Median.
- Pearson correlation coefficient.
- Test (t) for correlated samples.
- Test (t) for independent samples.
- Mode.
- Skewness coefficient.
- Percentage.

Presentation, analysis and discussion of the results

Presentation and discussion of the results of the pre- and post-tests for the control and experimental groups for the variables under study

Presentation of the results of the pre- and post-tests for the experimental group for motor coordination and technical performance of the preparation skill in volleyball for female students

Table 2: Shows the arithmetic means, standard deviations, and the calculated (t) value for the correlated samples, the level of test significance, and the significance of the difference for the pre- and post-tests of the experimental group for motor coordination and technical performance of the preparation skill in volleyball for female students.

Type of indication	Test significance level Sig	Calculated value of (t)	Post-test		Pre-test		Unit of measure	Statistical Parameters / Researched variables
			Standard deviation	Arithmetic mean	Standard deviation	Arithmetic mean		
Positive	0.000	9.92	0.45	8.86	0.63	11.12	Second	Eye-leg coordination
Positive	0.001	17.51	0.57	13.06	0.93	9.87	Degree	Eye-arm coordination
Positive	0.002	38.63	0.27	7.81	0.44	4.80	Degree	Technical performance of the preparation skill in volleyball

Displaying the results of the pre- and post-tests of the control group for motor coordination and technical performance of the preparation skill in volleyball for female students

Table 3: Shows the arithmetic means, standard deviations, and the calculated (t) value for the related samples, the level of test significance, and the significance of the difference for the pre- and post-tests of the control group for motor coordination and technical performance of the preparation skill in volleyball for female students.

Type of indication	Test significance level Sig	Calculated value of (t)	Post-test		Pre-test		Unit of measure	Statistical parameters / Researched variables
			Standard deviation	Arithmetic mean	Standard deviation	Arithmetic mean		
Positive	0,008	3.08	0.50	9.60	0.26	10.98	Second	Eye-leg coordination
Positive	0.000	6.07	0.77	11.25	0.75	9.55	Degree	Eye-arm coordination
Positive	0.000	14.78	0.46	6.64	0.31	4.78	Degree	Technical performance of the preparation skill in volleyball

Discussion of the results of the pre- and post-tests of the control and experimental groups for motor coordination and technical performance of the preparation skill in volleyball for female students

The results presented in Tables (2) and (3) for the arithmetic mean values, standard deviations and calculated (t) values for the (motor coordination) tests showed significant differences in the pre- and post-tests of the control and experimental groups in favor of the post-tests. The researchers attribute the reason for these differences for the control group to the educational exercises that were used by the team's coach and teacher, as he used exercises in various ways and methods, as well as the use of general and special physical exercises at the beginning of the preparatory section, and what these exercises include in terms of jogging, speed movements and jumping, as these exercises together contribute to developing physical and motor abilities.

As for the significant differences between the two tables for the experimental group members in terms of coordination and motor flexibility, the researchers attribute them to the application of the educational exercises they prepared, as these exercises focused on the sample members performing complex and diverse movements aimed at changing the body's positions whether on the ground or in the air. The researchers also used auxiliary tools in performing educational situations, namely (Signs, rings, stairs, rugs), and that these tools, if used during physical and skill performance, will contribute to developing physical and motor abilities, as "the auxiliary devices and tools work to improve and accelerate the learning process when learning and training learners in sports skills due to their positive effects of contributing to the learning and training processes with less time and effort, as they contribute to the integration of the educational and training unit to implement the planned curriculum with the aim of raising the learner's technical, tactical, physical and cognitive level".

The effectiveness of the educational exercises applied by the researchers in the educational units aimed to improve and raise the level of motor abilities (motor coordination). The skillful performance of the preparation skill and self-realization of learners and gaining them satisfaction with their overall performance, as "when implementing educational exercises effectively, the general performance of learners improves greatly and then enables them to gain an additional benefit, which is developing new learning about how to learn skills."

The results of Tables (2) and (3) for the values of the arithmetic mean, standard deviations and (t) values calculated in the post-tests of the technical performance of the preparation skill in volleyball for female students showed significant differences between the pre- and post-tests in favor of the post-tests in both the control and experimental groups. The researchers believe that the reason for the development of the technical performance of the members of the control group is due to the repetitions of the educational exercises prepared by the teacher and performed by learners in the educational units and regularity in the educational process. Repetitions also lead to consolidating the motor program in the learner and expanding his perceptions and concepts in order to understand the skill and its clarity, as "excessive repetition of any work will reduce error rates and increase learning rates, as well as lead to the speed of withdrawing information from Memory, therefore, gives the learner many attempts when starting to learn.

As for the significant differences shown by the two tables for the members of the experimental group, the researchers attribute them to the application of educational exercises that the researchers prepared according to what is required for the technical performance of the preparation skill, as it focuses on gradual progression from easy to difficult, change and diversification of educational exercises and the use of educational tools, as well as giving them feedback. It also included performing individual, pair and group exercises, in addition to educational and competitive matches. Regularity and continuity in educational units by members of the experimental research group and their practice of educational exercises and benefiting from the time invested in the technical performance of the preparation skill contributed effectively to accelerating the learning of the skill well, as increasing the actual time for skill performance leads to increased understanding and comprehension of movements, and this situation gives stability, firmness and comprehension, which leads to increasing the experience of female students in implementing the skill performance, as the educational curricula must include the required repetitions because "the skill can only be performed through actual practice of the skill performance, and the skill does not come through a little performance, but rather It comes through repeated performance coupled with learning.

The researchers believe that repetition supported by feedback helps learners master motor skills because feedback refines learners' motor performance, as increasing repetition and correction reduces errors and shows coordination in movement, so feedback increases learner motivation and encouragement. The researchers believe that the development of motor coordination among students contributed to the development of technical performance of the preparation skill, as carrying out the preparation process requires high coordination, fluidity, agility and flexibility in movement, and this is confirmed by (Aline Wadih Faraj), as "the development of physical and motor abilities enables the learner to perform the motor performance of the skill in the best possible way."

Presentation and discussion of the results of the tests (post-test. post-test) for the control and experimental groups for the variables under study

Presentation of the results of the tests (post-test. post-test) for the control and experimental groups for motor coordination and technical performance of the preparation skill in volleyball

Table 4: Shows the calculated value of (t) for independent samples, the level of test significance, and the significance of the differences between the test results (post-test, post-test) for the control and experimental groups for motor coordination and technical performance of the preparation skill in volleyball for female students

Type of indication	Test significance level Sig	Calculated value of (t)	Control group		Experimental group		Unit of measure	Statistical parameters / Researched variables
			Standard deviation	Arithmetic mean	Standard deviation	Arithmetic mean		
Positive	0.000	4.31	0.45	8.86	0.50	9.60	Second	Eye-leg coordination
Positive	0.000	7.52	0.57	13.06	0.77	11.25	Degree	Eye-arm coordination
Positive	0.000	8.69	0.27	7.81	0.46	6.64	Degree	Technical performance of the preparation skill in volleyball

Discussion of the results of the tests (Post-post) for the control and experimental groups for motor coordination and technical performance of the preparation skill in volleyball

From what was presented in Table (4), it was shown that there were significant differences in the post-tests between the two groups (control and experimental) in the (motor coordination) test in favor of the experimental group. This confirms that the educational exercises prepared by the researchers and used as required by the students' motor and skill performance in volleyball, especially the preparation skill, as this skill has a specificity when implemented. It differs from other skills in the nature of its performance, because it requires a set of physical and motor abilities, as well as its decisive role in the outcome of the matches. Therefore, the researchers focused on developing and improving the students' motor abilities when preparing them for the educational exercises, as these educational exercises included a set of complex movements that contribute to motor coordination, in addition to using exercises that include speed movements, jumping and changing body positions, as these exercises together contribute to developing motor abilities. The researchers also used some tools to assist in performing these exercises. The two researchers believe that learning volleyball skills requires the availability of many physical, motor and cognitive abilities, and that the development of these abilities contributes to the development of skill performance quickly and accurately, as "the skill of preparation requires requirements that must be available to learners, represented by various physical, motor and mental abilities, and they must be characterized by them to perform the skill accurately, including agility, flexibility, coordination, awareness, self-confidence and courage".

Through what was also presented in Table (4), we find that there are significant differences in the post-tests between the two groups (Control and experimental) in the test of technical performance of the skill of preparation in volleyball in favor of the experimental group. In the opinion of the researchers, this is due to the fact that the educational exercises were prepared in a way that contributes to the success of the learning process and the learners reaching a stage of mastery in the technical performance of this skill, as these educational exercises were a mixture of individual, pair and group exercises in addition to diversification and change in the method of performance as well as gradation from easy to difficult during their application.

The researchers also believe that the auxiliary tools that were used in applying these exercises contributed to learning the technical performance of the skill of preparation because they help learners control the path of the ball, performance and the time taken for performance, and thus provide stability for movement by fixing the place of performance. The use of educational exercises with auxiliary means works to approximate the reality of the movement or skill desired to be learned in the minds of learners, as "the player's feeling of her ability to perform the skill means feeling the movement, which It plays an important role in the process of motor coordination (1). The two researchers also believe that the development of motor abilities enables the learner to perform the motor skill in the best possible way, and without it the learner cannot perform this skill, whether by jumping or standing, changing direction at high speed, and seeing the appropriate places to direct the balls well.

Conclusions and recommendations

Conclusions

Based on the research results that were reached within the limits of the research community, it was possible to reach the following conclusions.

1. Some educational exercises helped develop the motor coordination of the legs and arms of the experimental group.
2. Some educational exercises helped learn the technical performance of the volleyball preparation skill for the experimental group.
3. The development of motor coordination was positively reflected in learning the volleyball preparation skill for the experimental group.

Recommendations

In light of the conclusions reached by the researchers, which proved the effectiveness of using educational exercises, the researchers recommend several recommendations.

1. Pay attention to using educational exercises according to the level of students in learning the volleyball preparation skill.
2. Adopting the prepared educational exercises as basic data when learning the volleyball preparation skill.
3. Pay attention to using educational exercises according to the students' capabilities in developing (Coordination and motor flexibility).

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