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RESEARCH ARTICLE

The Effect of Smit-Style Training on the CPK Enzyme, Kinetic Response Speed, and Accuracy of the Blocking Skill for Young Volleyball Players

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Abstract
The purpose of this paper is to prepare volleyball-style (SMlT) exercises, as well as identify the effect of (SMlT)-style exercises on the CPK enzyme, speed of kinetic response, and accuracy of the blocking skill for young volleyball players. The researchers to use the experimental method because it is compatible with the nature of the research problem, and to design the method of the two equal groups (experimental and control) with pre- and post-tests. The research population was determined by the young players of Al-Daghara Sports Club for the sports season (2023-2024), who numbered (14) players, and the freestyle players, who numbered two players, were excluded because their characteristics did not match the nature of the study. Thus, the total number became (12) players, and the researcher chose them entirely for the experiment, and they were distributed. Two groups were divided equally in a random manner (lottery method), after which the experimental group underwent training (SMlT) method, while the control group remained using the trainer's normal training curriculum. One of the most important results reached by the researcher is that: The exercises applied by the experimental research group using the SMlT method helped adapt the muscle cells by increasing the activity of the CPK enzyme . One of the most important recommendations recommended by the researchers is that: Researchers recommend adopting specialized exercises using the SMIT method as basic data when training volleyball players.

Keywords
Smit-Style Training , CPK Enzyme, Kinetic Response Speed, Volleyball

INTRODUCTION

The field of training has been affected in recent years by the revolution of science and technology, as the training process took a form, structure and organization consistent with the state of new development of methods, methods and means used in the training process (Radhi & Obaid, 2020b; Radhi & Obaid, 2020a) Scientific and technical development has added many new and modern methods in a way that is compatible with the nature and capabilities of the trainee through striving Coaches have to choose the best and most up-to-date methods that suit the specialized activity. Training methods have varied to raise the level of athletic achievement, and it has become extremely important for the coach to be familiar with and knowledgeable about these methods. Accordingly, scientific research has tended toward studying various sciences, including chemistry, biomechanics, anatomy, and sports physiology (Al-Waleili, 2000), And employing it to serve the science of sports training in order to raise the level of athletes in all sports, because these sciences are of fundamental importance in developing and evaluating training methods, and knowing the responses and adaptations that occur during the practice of sports activity, with the aim of achieving and investing in the specificity of training related to the type of activity in order to reach A direct impact on improving the skill, physical, functional and tactical level.

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One of the games that has received great attention in the field of sports training is the game of volleyball, because of its specificity in performing its skills, as it requires great muscular ability in addition to functional ability and high bio-kinetic capabilities when performing kinetic duty, in addition to enduring the offensive and defensive performance of volleyball, which requires High level of physical and skill performance.

The skill of blocking the is one of the skills that requires the player to have a high level of physical and skill performance in a consistent manner, so it is important that the physical capabilities and the physiological and skill variables serve each other to achieve the goal, and the level of the player's ability can be determined through these variables (Aleh, Radi, & Hashem, 2020).

One of the modern training methods is the SMlT method, which is one of the latest training methods that uses high-intensity training and moderate rest, with increased speed and strength for physical performance, and this is appropriate to the nature and characteristics of the game to create a state of functional adaptation, improve energy systems, and raise the physical level of the players.

All of this is worthy of study and research (Saikaew, 2015; Kazem, Alim, & Rady, 2022) especially if we know that there are those who do not pay attention to the effectiveness of this training method. Thus, the importance of research is evident through preparing SMIT-style training in a scientific manner, as researchers believe that it affects the enzyme (CPK) and the speed of the kinetic response, which is directly involved. On the accuracy of the blocking skill for young volleyball players.

Through the researchers' field experience and their follow-up of the Iraqi youth league matches, they noticed that there is a slowdown in the stages of technical performance of the blocking skill, which is reflected in the success and accuracy of that skill and directing the balls to the opponent's court. The researchers believe that the reason for this is the lack of coaches' use of exercises that are not compatible with the prevailing energy system. For the game of volleyball, the time to perform the skill does not exceed several seconds, and this falls within the phosphate energy system, as the majority of the exercises used go towards performance endurance and enter into the other energy system, so the researchers wanted to delve into this experiment by using (SMlT) style exercises, as Researchers believe that it will contribute effectively to developing the physiological, physical and skill aspect of the player, especially if we know the lack of use of the training method (SMIT), which is considered one of the training methods that develops the body's ability to its highest levels, as it helps to develop strength, speed and other bio-kinetic capabilities, and it also It is the first study in Iraq and the Arab world that uses the (SMlT) method. Through the above, the research problem is evident in the following question

Does using SMlT-style training have a positive effect on the CPK enzyme, kinetic response speed, and accuracy of the blocking skill for young volleyball players? . the research objective: eas prepare volleyball-style (SMlT) exercises, as well as identify the effect of (SMlT)-style exercises on the CPK enzyme, speed of kinetic response, and accuracy of the blocking skill for young volleyball players.

MATERIALS AND METHODS

Research Methodology

The method is one of the important factors that the researcher follows to solve his problem, and it is chosen according to the nature of the problem to be studied, as the nature of the problem necessitates (Saleh, Radi, & Hashem, 2020) the researchers to use the experimental method because it is compatible with the nature of the research problem, and to design the method of the two equal groups (experimental and control) with pre- and post-tests.

Community and sample research:

The research population was determined by the young players of Al-Daghara Sports Club for the sports season (2023-2024), who numbered (14) players, and the freestyle players, who numbered two players, were excluded because their characteristics did not match the nature of the study. Thus, the total number became (12) players, and the researcher chose them entirely for the experiment, and they were distributed. Two groups were divided equally in a random manner (lottery method), after which the experimental group underwent training (SMlT) method, while the control group remained using the trainer's normal training curriculum.

This study followed ethical standards and received approval from the University of Baghdad College of Physical Education and Sports Sciences

for Woman Ethics Committee Commission Date: 12.02.2024 Issue/Decision No: 2024/12. Participant provided informed consent, with the volunteer form covering research details, risks, benefits, confidentiality, and participant rights. The research strictly adhered to the ethical principles of the Declaration of Helsinki, prioritizing participant's rights and well-being in design, procedures, and confidentiality measures.

This article's necessary ethics committee permissions were obtained with University of Baghdad College of Physical Education and Sports Sciences for Woman Ethics Committee Commission Date: 12.02.2024 Issue/Decision No: 2024/12. Regarding vulnerable groups, the authors took into account the needs and priorities of the groups/individuals in which the study was conducted, in accordance by Articles 19 and 20 of the WMA Declaration of Helsinki , and the situation that the study could not be carried out outside these groups and individuals was taken into account. "In this study, additional precautions were taken by the researcher(s) to protect the volunteers."

Sample homogeneity

In order to control the variables that affect the accuracy of the research results, the researchers resorted to verifying the homogeneity of the research sample related to morphological measurements, namely (height, body mass, chronological age, training age), as the researcher used the skewness factor before proceeding to apply th main experiment to the two research groups (Control and experimental) as shown in "Table 1".

Table 1. shows the homogeneity of the research sample.

Variables	Measuring unit	Mean	Median	Std. Deviations	Skewness	Results
Length	Cm	184.75	184.5	1.879	0.399	homogeneity
Mass	Kg	75.812	75.63	2.286	0.238	homogeneity
Chronological age	Year	18.5	18.6	0.516	0.581	homogeneity
Training age	Year	4	4.1	0.564	0.531	homogeneity

From the results of Table (1), it is clear that the values of the skewness coefficient are smaller than (±1), which indicates the homogeneity of the research community in all variables.

Devices, tools and methods used in the research

Methods of data collection

Arab and foreign sources and references, personal interviews, tests and measurements, special forms to record test results for players.

Tools and devices used

Volleyball court, (14) volleyballs (Mikasa type), Colored adhesive tape (4), Measuring tape (40 metres), Terraces and barriers of different heights (70, 60, 50, 40, 30) cm (10), Medical cotton, sterile materials, A Chinese-made electronic device to measure height and weight, Bell balls (ball blocks) of different weights (2 kg, 4 kg, 6 kg), number (20), Casio sports stopwatch (3), (2) whistles, type (FOX), Office tools (paper and pens), (1) Lenovo laptop calculator, A Chinese-made electronic device to measure height and weight.

Field Research Procedures

Description Of CPK Enzyme Measurements

Measurement Method

Measurement of the concentration level of the CPK enzyme in the blood was performed immediately after giving the effort (volleyball block test). After completing the effort, the tester sits on a chair immediately after (5) seconds have passed, then venous blood is drawn (2 C). C) by the chemist from the research community, numbering (12) players, which is a sufficient quantity according to what was indicated in the instructions attached to the kits, as it is placed in medical tubes (tubes) with the player's name and number written on them, and it was transported directly to the laboratory, where The analysis of the enzyme kits is performed by a specialist doctor.

***Modified Nelson Kinetic Response Test* (Shaker, Tuama, & Radhi, 2022):**

Purpose of the test: to measure the ability to respond and move speed and accurately according to the choice of stimulus.

Necessary tools

A flat area free of obstacles, with a length of (20 m) and a width of (2 m), within which three lines are drawn. The distance between one line and the other is (6.40 m), and the length of the line in the middle is (1 m). A volleyball is placed hanging and falling on the ground on the two side lines. It is

preferable that it be Testing on the volleyball court. Electronic stopwatch, Measuring tape,

Administer the test

A.Recorder

Calls the names first and records the time of taking the test second.

B.Timer

Giving the start signal with the timing.

Performance specifications: The tester stands at one end of the center line, facing the timer, who stands at the end of the other end of the line. The tester takes a ready position so that the center line is between the feet, then leans his body forward slightly. The timer holds the stopwatch in one hand and raises it to the top, then speed moves his arm to the left or the right, and at the same time he starts the clock. When the experimenter responds to the start signal, he tries to run as speed as possible in the specified direction to reach the side line, which is 6.40 m away from the center line. He performs a diving skill to touch the hanging ball, and when the experimenter crosses the right side line, the timer stops the hour .

Test instructions

- If the tester starts in the wrong direction, the timer continues to run the clock until the tester changes direction and reaches the correct side line and touches the ball.
- The experimenter is given (8) consecutive attempts, with (20) seconds of rest between each attempt and the next, with (4) attempts in each side, and the attempts in each side are chosen in a random and successive manner.
- The laboratory is given a number of attempts outside the measurement under the same basic conditions for the purpose of familiarizing itself with the test procedures.
- The timer must practice the start signal so that he can give this signal with the arm and start the clock at the same time.
- The laboratory must not know the number of attempts required of it to perform in order to limit its expectations.
- The diving skill must be performed correctly, and the attempt must be repeated if the tester fails to perform the diving skill correctly.
- The test must begin with the timer displaying a signal (Ready - Start) on all attempts as shows “Fig. 1”.

Recording method

The time for each attempt is calculated to the nearest 1/100 second.

Laboratory score is the average of the eight attempts, as shown in the equation below:

-

$$total\ score\ of\ the\ laboratory = \frac{total\ time\ of\ the\ eight\ attempts}{8}$$

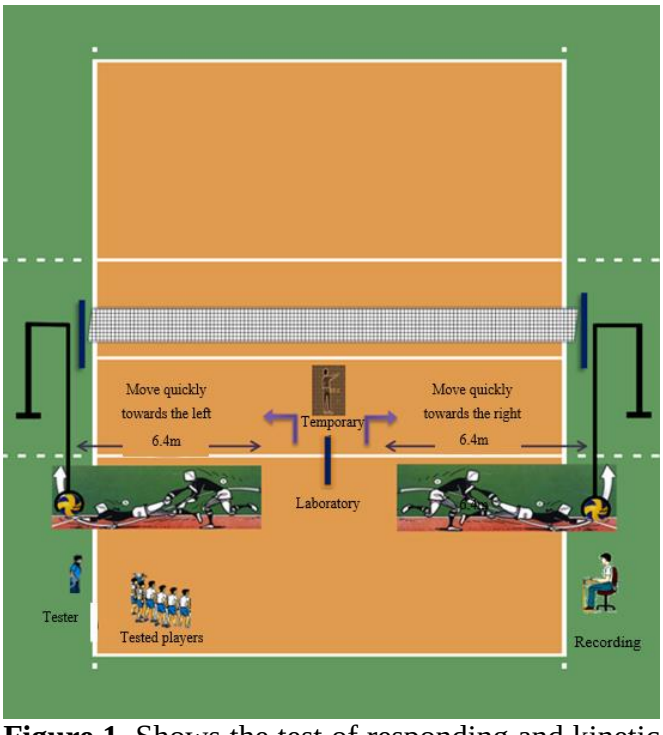

Figure 1. Shows the test of responding and kinetic speed and accuracy according to the choice of stimulus.

Testing the accuracy of the blocking skill (Hashem, Al Edhary, Radhi, & Hmeid, 2022).

- Test name: Accuracy of the Blocking skill.
- The aim of the test: to measure the accuracy of the skill of blocking the with volleyball.
- Tools used: a legal volleyball court, 5 legal volleyballs, and colored adhesive tape to divide the opposite court.
- Performance specifications: The tester stands in position (3) in front of the net, at a distance of (50) cm from the net, and in a position of preparation for the blocking process. The coach performs the smash hit skill from the opposite court, and the tester performs the blocking skill when he hears the sound, as shown. In Figure (2).

Performance conditions

Each laboratory has (5) consecutive attempts. The smash must be good in each attempt. Grades are calculated according to where the ball landed, as follows:

- In the center 2 degrees.
- In 3rd place, three grades.
- In 4th place, 2 degrees.
- Outside these areas (zero) grades.

Recording

The tester will be credited with the grades obtained in the five attempts, noting that the maximum grade for the test is (15) degree.

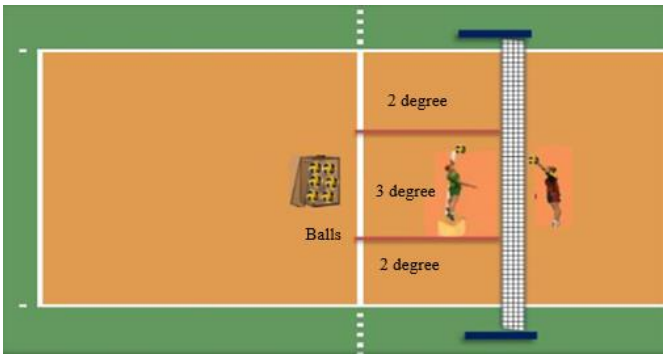

Figure 2. Shows the accuracy test of the volleyball blocking skill

Exploratory experience

The researchers conducted a reconnaissance experiment on a sample of the original research community and the same research sample, with a number of (4) players on 17/10/2023. The exploratory experiment aims to:

Ensure the validity and suitability of the playground, the tools and devices used, and the research supplies. Organizing the auxiliary work team, and the required instructions. Knowing the readiness of the research sample to perform skill tests. Know the time the tests take.

Main experience

Pre-tests

After completing and verifying the exploratory experiment, the researchers implemented the main experiment by applying tests and standards to the research community, and pre-tests were conducted on Thursday 19/10/2023.

Equivalence of the two research groups

In order for the researchers to be able to attribute the differences that occur in the results of the post-tests for the variables under study to the effect of the experimental factor, the researchers resorted to verifying the equality of the two groups by using the t-test for independent samples of the variables investigated.

Table 2. Shows the equality of the two research groups

Variables	Measuring unit	Control group		Experimental group		T calculated	Level sig	Type sig
		X	SD	X	SD			
CPK enzyme activity after stress	IU / L	318.8	30.141	301.6	32.175	0.429	0.679	Non sig
Speed of kinetic response	Second	1.976	0.084	1.989	0.069	0.383	0.71	Non sig
Accuracy of the Blocking skill	Degree	6.687	1.824	6.976	1.589	0.947	0.454	Non sig

*p ≤0.05 below, 10 degrees of freedom , Arithmetic Mean (X), Standard Deviation (SD)

Through Table (2), it becomes clear to us that the value of the test significance level (sig) is greater than the significance level (0.05), and for all variables under study, therefore, the test significance is not significant.

Preparing and implementing exercises using the SMIT method

The researchers prepared and organized the exercises using the SMIT method, based on the researchers' personal experience, and they were applied to the experimental group on 21/10/2023 until 20/12/2023, taking into account (intensity, repetitions, and appropriate rest periods). The researchers codified these exercises on a scientific basis. As well as the physical and functional ability of the research sample, the tools used, and the training method, so that these exercises are able to develop the level of CPK enzyme activity, the speed of kinetic response, and the accuracy of the blocking skill to achieve the purposes and objectives of the training process.

The details of the SMIT-style training in the training curriculum are as follows

The total number of training units that included SMIT-style training was (24) units, and the number of weekly training units that were implemented was (3) units for a period of (8) weeks. The time of training using the SMIT method in one training unit is (25-30) minutes. The goal of SMIT-style training is to develop the activity level of the CPK enzyme, the speed of kinetic response, and the accuracy of the blocking skill. Taking into account the exchange of work between muscle groups. Planning training formations using the SMIT method during the weekly and daily units (1-2).

Post-tests

The researchers, with the help of the assistant staff, conducted the post-tests for the research sample after completing the SMIT-style exercises, and that was on (23/12/2023) and in the same sequence as the pre-tests, as the researcher took into account the same conditions in which the pre-tests were conducted in terms of the sequence of tests.

Statistical Analysis

A statistical program was used in the statistical analysis of the data obtained. Arithmetic mean, standard deviation, frequency, minimum and maximum values were used in statistical representations of the data. In the normality testing of the data, kurtosis and skewness values of ±1.5 were taken into consideration. Independent Samples T-test were used in the analysis of normally distributed data.

RESULTS

Presentation and discussion of the results of the pre- and post-tests for the control and experimental groups for the variables under investigation: Presentation of the results of the pre- and post-tests for the control group for the investigated variables.

Table 3. Shows the resulte for pre- and post-tests for the control group for the investigated variables.

Variables	Measuring unit	Pre-test		Post-test		T calculated	Level sig	Type sig
		X	SD	X	SD			
CPK enzyme activity after stress	IU / L	301.6	32.175	341.2	30.812	3.48	0.025	Sig
Speed of kinetic response	Second	1.976	0.084	1.873	0.045	3.938	0.011	Sig
Accuracy of the Blocking skill	Degree	6.687	1.824	9.325	0.524	4.958	0.000	Sig

*p ≤0.05 below, Arithmetic Mean (X), Standard Deviation (SD)

Presentation the results of the pre- and post-tests for the experimental group for the investigated variables

Table 4. Shows the shows the resulte for the pre- and post-tests for the control group for the investigated variables.

Variables	Measuring unit	Pre-test		Post-test		T calculated	Level sig	Type sig
		X	SD	X	SD			
CPK enzyme activity after stress	IU / L	318.8	30.141	415.6	31.251	12.942	0.00	Sig
Speed of kinetic response	Second	1.989	0.069	1.813	0.030	6.601	0.001	Sig
Accuracy of the Blocking skill	Degree	6.976	1.589	11.967	0.749	5.867	0.000	Sig

*p ≤0.05 below, Arithmetic Mean (X), Standard Deviation (SD)

Presentation the results of the tests (post-post) for the control and experimental groups for the investigated variables.

Table 5. Shows shows the resulte differences between the test (post-test) for the control and experimental groups for the variables investigated.

Variables	Measuring unit	Control group		Experimental group		T calculated	Level sig	Type sig
		X	SD	X	SD			
CPK enzyme activity after stress	IU / L	341.2	30.812	415.6	31.251	2.903	0.016	Sig
Speed of kinetic response	Second	1.873	0.045	1.813	0.030	2.378	0.039	Sig
Accuracy of the Blocking skill	Degree	9.325	0.524	11.967	0.749	7.460	0.000	Sig

*p ≤0.05 below, Arithmetic Mean (X), Standard Deviation (SD)

DISCUSSION

The results presented in Tables (3) and (4) for the tests of the variables showed that there were significant differences between the pre- and post-tests and in favor of the post-tests for the control and experimental groups. The researchers attribute the reason for this significant difference to the members of the control group due to the exercises that were applied using methods and techniques prepared by the trainer. In its training units, the repetitions performed by members of the control group and the continuation of sports training lead to the occurrence of functional adaptations in certain proportions, and among these adaptations is the concentration of the enzyme (CPK) (Sameer, Rashid, & Radhi, 2022), as well as the development of kinetic response speed and its reflection on the accuracy of the skill of blocking the in volleyball, and this is what The members of the control group helped to make this difference. As for the difference that occurred for the members of the experimental group in the level of activity of the enzyme (CPK), the researchers attribute it to the members of the experimental group's use of exercises prepared by the researchers using the (SMIT) method, which were codified according to energy production systems appropriate for muscle work, as the The training units prepared by the researchers helped improve the players' physiological ability, according to what was noted. The researchers also made sure that the SMIT-style exercises worked in accordance with the specific requirements of the game, the players' physical and physiological capabilities, and the goals of the research. This resulted from their use of extreme anaerobic exercises that are characterized by intensity. (Allawi and Abdel Fattah, 1984). This leads to a state of adaptation necessary for energy production, and the reason is also due to the high-intensity physical loads that were practiced repeatedly because training increases the effectiveness of the CPK enzyme, as the work falls within the phosphate energy system, as training according to this system increases The concentration rate of the enzyme (CPK) is high, and this is what the results showed. The nature of performance in the game of volleyball depends mainly on high phosphate energy to carry out kinetic tasks that require strong and rapid muscle contractions. This game has a specificity that distinguishes it from other games, as it constitutes the phosphate energy system. (80%) of the energy needed to play volleyball (Al-Waleili, 2000). This is what the researchers were keen on when they repeated the training using the (SMIT) method.

The researchers also attribute the reason for this difference between the pre- and post-measurements of kinetic response speed to the keenness of the experimental group members and their commitment to performing exercises according to the (SMIT) method on a continuous and regular basis, and this also helped in the occurrence of a concomitant development of performing high-intensity physical effort, and this is what Saikaew Chuachan pointed out. He pointed out that "organized training according to the SMIT method leads to functional and physical changes. Well-trained individuals can adapt to the functional changes that occur in the body's systems as a result of muscular effort and continue with this effort" (Saikaew, 2015; Kazem, Alim, & Rady, 2022.).

The researchers also made sure that these exercises were in multiple and varied directions of movement because this would contribute to the player's ability to perform skills better, especially the speed of kinetic response, which is closely linked to the skill of blocking the . Thus, the

exercises prepared in the (SMIT) style have worked to improve speed. The movement transition represented by the speed of response through organizing the muscular action between contraction and relaxation of the working muscles, which helps in performing the movement easily and in an organized manner. This is consistent with what pointed out, "SMIT-style exercises include multi-directional movements, which... "It makes it one of the best exercises used to improve physical abilities" (Radhi & Obaid, 2020b; Radhi & Obaid, 2020a). Because speed, diversification, and change in play from one skill to another, whether it is a defensive or offensive skill, requires the player to have a high degree of speed and reaction speed, as believes, "The game of volleyball is one of the games that has variable and fast situations." (Radhi & Obaid, 2020b), so the researchers paid attention to response speed training and linked it to the accuracy factor of the skill of blocking in volleyball, in order to make the response integrated with its speed and accuracy. Thus, the exercises prepared using the (SMIT) method contributed effectively to developing the speed of kinetic response and accuracy of the skill of blocking in volleyball, etc. This is reinforced by what stated, "Performing tactical skills or duties is done First, intellectually, and secondly, kinetic. This leads to carrying out the duty speed and in the shortest possible time." (Hussein, 1990). Thus, SMIT-style physical exercises accompanied by skill exercises showed significant results in differences because they work to integrate physical and kinetic abilities together in performance.

As for the results presented in Table (5), which show the preference of the differences in favor of the experimental group in the post-tests, the researchers believe that the exercises that were given to the members of the experimental group that were applied using the (SMIT) method created adaptations to the body's functional systems due to their exposure to extreme physical loads, which were It falls within the phosphate energy system, as it requires a rapid release of energy, and the time for performing exercises reaches the range of (10-14) seconds, and the enzyme (CPK) is considered one of the important and direct factors in accelerating the release of energy in the body by rebuilding ATP) as the phosphate system depends In rebuilding ATP on the chemical compound creative phosphate, the enzyme (CPK) transfers the phosphate group from the compound creatine phosphate to adenosine diphosphate (ADP) to form adenosine triphosphate (ATP) and creative, and vice versa, and the player needs energy. To continue physical performance, as "the energy that is liberated during the fission of adenosine triphosphate (ATP) is considered the direct source of energy that the muscle uses to perform the required work, but the amount of ATP stored in the muscle is very small and is not sufficient to produce energy for more than a few seconds. If there is ATP in the muscle cell, there will be no muscle movement or contraction, so ATP is constantly being rebuilt through ATP rebuilding systems (Sameer, Rashid, & Radhi, 2022) and (Allawi and Abdel Fattah, 1984).

The researcher also attributes the reason for the development of the members of the experimental group at the expense of the members of the control group in the speed of kinetic response is due to the nature of the exercises that were applied in the (SMIT) method, which helped to develop this ability because it was of an explosive nature and changed from one moment to the next, as the speed of the response depends on movements with a response. Momentary action, which was applied by the members of that group, contributed greatly to the process of linking the speed of response and the skill of blocking, which is one of the requirements for the success of performing these skills with extreme speed and accuracy. Likewise, the principle of diversification and change that the researchers used, in addition to continuous and scientific repetitions, contributed greatly to the development of This ability depends on fast and sudden movements, and this is what Magill confirmed when he said, "Diversifying and organizing training experiences and diversity in movement will increase the players' experience and increase the player's ability to perform the skill better" (Khalaf , 2001) and (Al-Jburi, Rashid, & Radhi, 2022).

The exercises were also prepared to be consistent with the nature of performance and the movement paths of the blocking skill, and they were codified according to the (SMIT) method, which is one of the training methods that raises the body's ability to its maximum limits, to be a challenge to the anaerobic energy systems, as it uses muscle strength and speed to contribute to the development of the physiological aspect. The physical aspect of the player is that the skill of blocking the requires great muscular ability and

rapid performance without decreasing the level of performance and facing fatigue. Here it should be noted that the majority of the skill exercises prepared by the researchers fall within the anaerobic energy system, and this is in line with the literature of the (SMIT) method, and this is confirmed by studying the objectives of the SMIT method .“His training aims to improve specific energy systems, primarily, and its goal is to provide adaptation and efficiency in the phosphorous energy system.” (Paquette et al., 2017)

Conclusions

Based on the research results that were reached within the limits of the research community, it was possible to reach the following conclusions: The exercises applied by the experimental research group using the SMlT method helped adapt the muscle cells by increasing the activity of the CPK enzyme. The continuous training of exercises that were applied using the SMlT method led to the creation of adaptations that express the extent of the development of the experimental research group in the speed of kinetic response and accuracy of the skill of blocking the with volleyball. The development of the concentration of the enzyme (CPK) and the speed of the kinetic response led to the development of the accuracy of the skill of blocking the in volleyball for young players.

Recommendations

Researchers recommend adopting specialized exercises using the SMIT method as basic data when training volleyball players. Conduct a periodic evaluation of training results through physiological variables and kinetic response speed as important indicators for evaluating the training status of players. Conduct similar studies on other individual and group activities, and on different age groups.

ACKNOWLEDMENT

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Conflict of Interest

We confirm that all tables and figures in this article are ours and written by the researchers themselves.

Ethics Committee

This study was performed by adhering to the Helsinki Declaration. ethics committee permissions were obtained with University of Baghdad College of Physical Education and Sports Sciences for Woman Ethics Committee Commission Date: 12.02.2024 Issue/Decision No: 2024/12

Author Contributions

Research Design- Z. A. , M. N; Statistical analysis- Z. A. , M. N, A.H; Preparation of the article, Z. A. , M. N , AK, A.H; Data Collection- Performed by Z. A. , M. N , AK, A.H.

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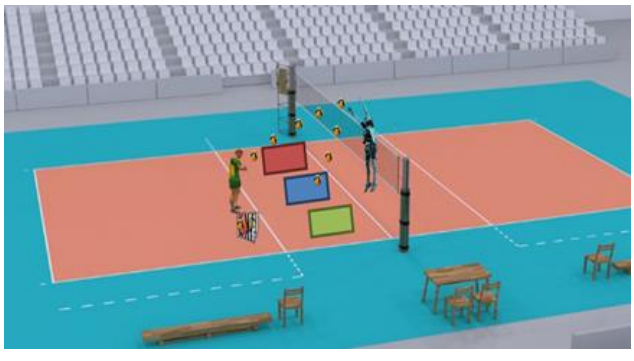
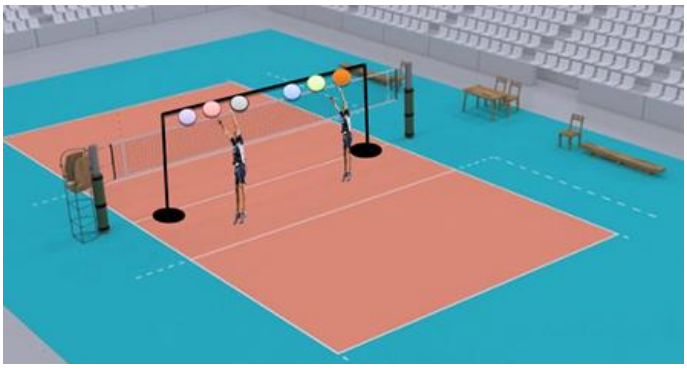
Appendix (1)

A sample of exercises prepared and applied using the SMIT method.

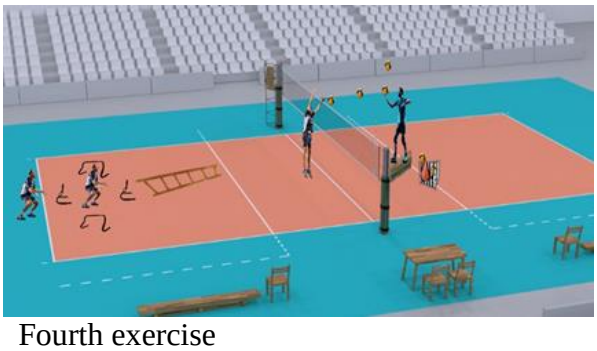
- First exercise:
- Objective of the exercise: Developing (blocking skill, response speed)
- Equipment and tools used: (10) legal volleyballs, (3) spongy floor mats, (1) electronic stopwatch, (1) whistle.
- Perform the exercise: The player stands at position (3) near the net, and the coach stands on the other side of the field above the attack line at position (3). The sponge floor mat is placed in the attacking area and the distance between them is (1 m) and a distance of (45 cm) is left from the side line. The coach throws the ball to the player, then determines the color of the square in which he wants to drop the ball, so the player can create a blocking and try to put the ball inside the desired square.



- Second exercise:
- Objective of the exercise: to develop (the skill of blocking the and speed of response).
- Equipment and tools used: hanging colored balloons, (1) electronic stopwatch, (1) whistle.
- Perform the exercise: The player stands at center (3) near the net and fixes the two poles on the other side of the field with (6) colored balloons hanging in it. At the signal to start the exercise, the player creates a repelling and tries to touch the hanging balloons, according to the color that the coach releases.

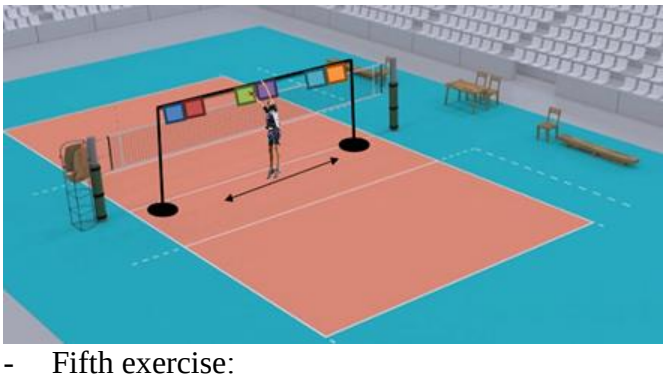


- Third exercise:
- Objective of the exercise: Developing (the skill of blocking the and speed of response)
- Equipment and tools used: legal volleyballs (10), ground ladder (5 m), barriers (40 cm) high (4), benches (60 cm) high, electronic stopwatch (1), whistle (1). 1.(
- perform the exercise: Four hurdles (40 cm) high are placed in the middle of the court at the beginning of the service line. The player stands in the middle of the hurdles, and the coach stands on the bench on the opposite side in position (3). When the exercise begins, the player jumps with both legs. Over the right hurdle and then back to the middle, then he jumps with both legs to the left hurdle and returns to the middle, then jumps backward with both legs and returns to the middle again. After that, the player jumps forward with both legs and jumps over the ground ladder by jumping once open to the outside of the ladder and another time together. Inside the ladder, the student then goes towards the net to block the balls directed by the coach.

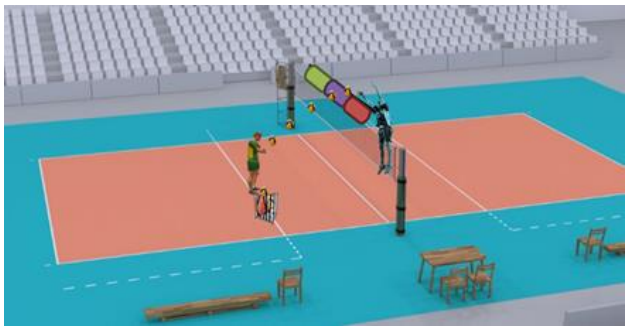


- Fourth exercise
- Objective of the exercise: to develop (the skill of blocking the , speed of response).

- Equipment and tools used: hanging colored pieces, (1) electronic stopwatch, (1) whistle.
- perform the exercise: The player stands at center (3). On the opposite side of the field are placed hanging colored pieces. At the signal to start the exercise, the player creates a blocking and tries to touch the hanging pieces according to the color that the coach calls.



- Fifth exercise:
- Objective of the exercise: to develop (blocking skill, response speed).
- Equipment and tools used: (12) legal volleyballs, (3) colored boards measuring (75 x 30 cm), (1) electronic stopwatch, (1) whistle.
- perform the exercise: Three colored boards are placed on the net, each board a different color. The coach stands above the attack line, and the player stands in front of the boards at a distance (55 cm) from the net in position (3). The coach calls out the color of the board and throws the ball in order to The player creates a blocking in front of him.



- Sixth exercise:
- Objective of the exercise: to develop (blocking skills, response speed).
- Equipment and tools used: (10) legal volleyballs, a flexible rubber band, (1) balance ball with a diameter of (90 cm), (1) bench with a height of (60 cm), (1) electronic stopwatch, (1) whistle.(1) .
- perform the exercise: The player stands on a balance ball at center (3) near the net and is secured with a flexible rubber band from the student's waist, held by the coach. M. stands. The coach is on the opposite side of the field, above the bench at center (3), and when the exercise begins, M. The coach throws the ball up to perform a smash hit, and the player creates a blocking by jumping and landing on the balance ball.

Appendix (2)

Shows the sample of training units

Training unit/first, Training unit intensity: 90%, Exercise time: (28.43) minutes

No.	No. Exercise	Time to perform the exercise	Rest between one exercise and another	Total working circuit time (SMIT) method	Total rest time between exercises for a SMIT style circuit	Rest time between circuits
1	2	15.5sec	90sec	102.9sec	450sec	300sec
2	3	16.6sec	90sec			
3	1	18.8sec	90sec			
4	4	16.6sec	90sec			
5	5	16.6sec	90sec			
6	6	18.8sec	-----			
Then repeat the same circuit once during the training unit						