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RESEARCH ARTICLE

The effect of (physical-skill) exercises according to different levels of training intensity on some physiological indicators and anaerobic capacity of volleyball players under 19 years of age

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Abstract: In working on using physical skill exercises within two training programs based on studied scientific foundations to develop some physiological indicators and anaerobic capacity, as well as knowing which levels of intensity achieve the best results with regard to the study variables to serve the development of this game in the future. As for the research problem, and through following up on the developments in volleyball development, it was noted that there is a large fluctuation among young players in the level of performance during the stages of play. The researcher attributes the lack of stability in performance to the inefficiency of the player's physiological state, in addition to the phosphagen anaerobic capacity. Here, the researcher decided to study this problem through measuring and testing some indicators and knowing their condition and treating them by preparing physical skill exercises based on scientific foundations within two training programs with different levels of intensity. The objectives of the research were to prepare special exercises to develop some physiological indicators and anaerobic capacity for volleyball players aged under 19 years, and to identify the superiority of the two training programs through the post-results (post-post) of the two experimental groups in the measurements. Physiological and anaerobic capacity test, the researcher assumed that there is a positive effect of exercises (physical-skill) according to varying percentages of training intensities on some physiological indicators and anaerobic capacity of volleyball players, there is a preference for one of the two groups in the post-results (post-post) of physiological measurements and anaerobic capacity test of volleyball players. The researcher used the experimental method with the method of two equivalent experimental groups, and the research sample was representing the players of the specialized volleyball school in Al-Jabaish district, aged under 19 years, numbering (22) players.

Keywords: volleyball development, two training programs, physiological indicators.

INTRODUCTION

The major changes in the field of sports training and related sciences during the last decade of the last century have shown many tangible developments, as applied research in this field has achieved a qualitative leap in training factors (physical, skill, planning, psychological, cognitive) in various sports in general and volleyball in particular. However, there are still many topics that need further research and experimentation to explain them, as the science of training is advancing at an amazing speed through the information it derives from the results of modern research and studies related to various sciences, including sports physiology. Sports physiology represents the basic foundation upon which the science of training is based to bring the player to the best levels, as it relies on scientific facts derived from objective laboratory measurements and tests that give accurate results that can be relied upon to determine the functional status of the player. In addition, every activity or physical effort that is carried out leads to different physiological responses for the body's functional systems, and the degree of these responses varies according to the degree of loads implemented, whether oxygenic or non-oxygenic. Thus, training loads can be directed and regulated based on capabilities. The physiology that characterizes the athlete and according to the training goal, there are some games, including volleyball, in which the performance of some of its skills is characterized by high intensity and in a relatively short time, which requires the player to have a high anaerobic capacity, i.e. the ability to rebuild.ATP is quickly released to provide the energy needed for muscle contraction in addition to the rapid elimination of lactic acid. Therefore, this ability must be developed through optimal training to appear in a manner consistent with performance. The importance of the research is highlighted in giving the coach a clear idea to monitor the player's health status and protect him from reaching critical conditions that negatively affect the efficiency of the functional devices as well as the level of skill performance. In addition to using skill-based physical exercises within two training programs built on studied scientific foundations to develop some physiological indicators and anaerobic capacity, in addition to knowing which levels of intensity achieve the best results in relation to the study variables in a way that serves the development of this game in the future.

1-2 Research problem

By following many matches of the youth league and the first division league in volleyball, and being a former player in the Iraqi league, the researcher noticed in the advanced stages of the match fluctuations in the skill performance, especially defensive skills, as a result of repeated effort, in addition to the presence of simple errors that would affect the team's level in general, in addition to the appearance of signs of fatigue on the players, which indicates that some of the related physiological indicators are not at their best levels, in addition to the anaerobic capacity of the players being relatively immature according to the performance requirements, which prompted the researcher to delve into this problem by setting physical and skill exercises within two training programs that are applied to two groups with certain percentages of intensity that differ as an attempt to address the study problem and know which of the two programs the workers can plan their programs according to.

1-3 Research objectives

1- Preparing special exercises to develop some physiological indicators and anaerobic capacity for volleyball players under 19 years old.

2- To identify the superiority of the two training programs through the post-test results (post-post) of the two experimental groups in physiological measurements and anaerobic capacity test.

1-4 Research hypotheses

1- There is a positive effect of exercises (physical - skill) according to different levels of training intensity on some physiological indicators and anaerobic capacity of volleyball players.

2- There is an advantage for one of the two groups in the post-post results of the physiological measurements and the anaerobic capacity test for volleyball players.

1-5 Research areas

1-5-1 Human field: Players of the Talent Center Specialized in Volleyball - Al-Jubais District

1-5-2 Time frame: 10/15/2024 to 9/29/2025

1-5-3 Spatial area: Sports hall in Al-Jabaish district - Iraq Laboratory

MATERIALS AND METHODS

2-1 Research Methodology:

The researcher used the experimental method with the method of two equivalent experimental groups, as it is the most appropriate method for the research problem.In this method, more than one group is used, provided that equivalence is achieved between the two groups in all variables.(kamel 2023)( ).

3-2 Population and sample Urge:

The research community consisted of young players of the specialized volleyball center in Al-Jabaish district, which includes players from the clubs (Al-Jabaish, Al-Ahwar, and some other clubs), numbering (22) players. The research sample was chosen intentionally, and they are the high smash players, numbering (14) players. Then the research sample was divided into two experimental groups intentionally, with (7) players in each group..

2-3 Sample homogeneity and equivalence:

2-3-1 Sample homogeneity:

To ensure sample homogeneity and avoid individual differences that might affect the research results, the researcher took a number of measures to control variables, even though the selected sample was within a similar age range. The homogeneity of the sample as a whole was verified before dividing it into two groups.Two experimentsFor this purpose, statistical processing was conducted using (arithmetic mean, standard deviation, and coefficient of variation), with the aim of revealing the extent of the existence of differences between sample members or not, as shown in Table (1).

Table (1)

It shows the homogeneity of the research sample in terms of training age, height and weight.

coefficient of variation	standard deviation	arithmetic mean	Unit of measurement	Measurements and variables	T
1.951%	4.276	219,142	month	Chronological age	1
4.921%	2.243	45,571	month	Training age	2
3.353%	2.455	73,214	kg	the weight	3
1.927%	3.472	180.121	poison	height	4

2-3-2 Equivalence of the two research groups: In order to know the reality of measurements and tests for the two experimental groupsFig andTo attribute differences to the experimental factor, the two groups must be completely equivalent in all conditions.(kamel 2024) [(1)]That is, the work is on one starting line, so the researcher measured these

([1]) Saif Shaker Kamel: Training according to the principle of kinetic momentum and its effect on the values of some kinematic variables and the accuracy of performing the smash serve skill in volleyballJournal of Thi Qar University for Physical Education Sciences, Vol. 1, No. 4, Part 2, 2024, p. 143.

indicators to ensure the equivalence of the two groups.Usinga test(t) For independent samples between the two groups, as shown in Table No. (2), and this is what qualifies the researcher to conduct his research and apply his exercises.

Table No. (2)Shows the arithmetic means, standard deviations and the value of (T) Calculated and the significance level value for the experimental and control groups in the pre-test

Type of indication	Sig	value T The calculated	empiricismThe group		The officerThe group		Statistical parameters tests
			A	S	A	S	
Non-moral	0.212	1.429	3,199	217,714	4,859	214,571	Chronological age
Non-moral	0.701	0.805	2,160	46	2,410	45,142	Training age
Non-moral	0.613	0.749	2,429	73.72	2.563	72,714	The mass
Non-moral	0.924	0.098	3,199	179,285	2.14	179,428	height
Non-moral	0.785	0.368	6.725	456,285	5.307	455,094	Enzyme concentration ratioLDH
Non-moral	0.933	0.140	2,429	320,285	1.611	319,257	Enzyme concentration ratioCPK
Non-moral	0.623	0.422	0.043	7.23	0.0448	7.24	Blood pH
Non-moral	0.489	0.403	1.670	179,047	2.263	178,618	heart rate
Non-moral	0.508	0.707	3,387	90,142	2.863	91,328	anaerobic phosphagen capacity
Non-moral	0.726	0.744	2.193	49,142	2.517	50,081	anaerobic lactic capacity

2-4 Methods and tools used:

✓**Information collection methods:**

☉Arabic and foreign sources.☉Personal interviews.☉ Note.☉Testing and measurement.

✓**Tools and equipment used:**

- Electronic device for measuring height and weight (1).
- Blood storage tubes containing a substanceEDTA anticoagulant No. (20).
- device(Lactate pro2) made in Japan by the company (Arkray) To measure the concentration of lactic acid in the blood.
- German-made device from the company ((Beurer heart rate monitor
- The volleyball court is legal.
- Volleyballs (32) of different types.
- Rings with a diameter of (60 cm) number (20).
- Barriers of different heights (20, 30, 40 cm) number (10) and of (50 cm) height number (10)
- (30) (30) cm high signs.
- Barriers of different heights.

2Field research procedures

2-5-1 Defining search variables

After reviewing many similar studies and scientific sources in the field of sports training physiology and conducting some personal interviews The research variables that were agreed upon were determined in accordance with the research problem and were as follows:

First: Physiological variables:

1- Enzyme concentration ratio (LDH) in the blood.
2- Enzyme concentration ratio (CPK) in the blood
3- acid-base balance of bloodPH.
4- Heart rate.

Second: Anaerobic capabilities:

1- Phosphagenetic capacity.
2- Lactic capacity .

2-5-2 Research tests:

First // Phosphagen deoxygenation capacity(Vertical jump from a standstill)(1)

- Test objective: To measure the phosphagen deoxygenation capacity.

Equipment and tools: a wall according to the performance condition, a medical scale to measure body weight, and a metal measuring tape to measure height.

- Performance specifications: The tester holds a piece of chalk, stands facing the wall on the side, and extends the arm as high as possible to make a chalk mark on the board or wall. Then he swings the arms back and bends the knees to a right angle only. This is followed by extending the knees and pushing the feet upwards to reach the maximum possible height. The tester is given three attempts, and the best result is counted for him, as shown in Figure (2).

- Recording method: The short anaerobic capacity is calculated in the vertical jump test according to the following equation: Phosphagen anaerobic capacity = 2.21 × body weight × jump distance. Unit of measurement (kg.m/s).

secondly// Lactic aerobic capacity test (anaerobic step test)[1)]

- Test objective: To measure the anaerobic lactic capacity for 60 seconds.

Equipment and tools: A seat or box 40 cm high, an electronic stopwatch, and a scale for measuring weight.

- Performance specifications: The tester stands facing the side of the box or bench, and one foot is placed on the box (the tester's preferred leg) while the other leg is free on the ground. When the timing signal is given, the player begins to raise the free leg and place it next to the leg above the box and repeat this performance in a rhythm of two counts (one - two, one up… two down). The tester must perform the largest number of steps within 60 seconds. The step is not counted if the tester bends the torso forward or bends the free leg..

- Recording method: The number of steps taken by the test subject within (60) seconds is calculated (performance time), and the anaerobic lactic capacity is calculated using the following equation.

1.33 Lactic anaerobic capacity $= \frac{\text{وزن المختبر (كغم)} \times \text{المسافة المقطوعة (ارتفاع الصندورق)} \times \text{عدد الخطوات}}{\text{الزمن}}$

2-6 Exploratory experiments:

First pilot experiment:-

The researcher conducted a first pilot experiment for the tests used in the research on Friday 11/22/2024 in the closed sports hall of the specialized center in Al-Jabaish district on a sample of (4) players who are part of the research sample, and they were:The aim of this is as follows:

- Ensure that the playground and the tools used are fit for the tests.
- The extent of testers' readiness to apply the tests.
- Preparing the support team and familiarizing them with the nature of the work and procedures.
- Knowing the time taken to implement the tests used in the research.

The second exploratory experiment: -

The researcher conducted a second exploratory experiment on Saturday 11/23/2024 in the indoor sports hall of the specialized center in Al-Jabaish district on the members of the experimental group. During this experiment, the exercises used in the research were applied to the two experimental groups for the purpose of verifying the following matters: determining the number of repetitions for each exercise used from the jumping exercises.

- The suitability of the exercises for the research sample members and the possibility of applying them.
- Determine the maximum intensity for each exercise in order to regulate the training loads during training units.
- Knowing the recovery time (rest) and returning the player's ability to perform the next exercise with the same efficiency.
- Knowing the time required to apply the training vocabulary prepared by the researcher.

2-7 Main experiment

2-7-1 Pre-tests

The researcher, in the presence of the assistant staff, conducted the pre-tests and measurements for the research sample on the morning of Wednesday, November 27, 2024.In the indoor sports hall of the specialized center in Al-Jabaish district, the anaerobic lactic capacity test and the defensive performance endurance test in volleyball were tested, then the physiological indicators under study were extracted after the implementation of the final test.

2-8-2 Main Experiment

(1) Muhammad Hassan Allawi, Muhammad Nasr al-Din Radwan: Measurement in Physical Education and Sports Psychology, 1st edition. Cairo, Dar Al-Fikr Al-Arabi, 1979, pp. 122-129.

(1) Muhammad Hassan Allawi, Muhammad Nasr al-Din Radwan:Source previously mentioned, pp. 157-167.

In order to obtain effective exercises, it was necessary to review modern sources and references in the science of sports training that would be sufficient to enrich the researcher with information.Matt helps him put exercisesH(Kamel 2023)[(2)].

❖ The most important clarifications regarding the application of the two training programs**:**

- **The application starts on Saturday 11/30/2024 and ends on Wednesday 2/5/2025.**
- **The duration of implementing the exercises within the two programs is (10) weeks.**
- **The days of implementing the exercises within the two programs (Saturday - Monday - Wednesday) of each week**
- **The number of training units in which it was applied is (30) training units.**
- **Number of special exercises used (22) exercises.**
- **Number of exercises applied in the training unit (3) exercises.**
- The researcher considered the relationship between the components of the training load (intensity, volume, and rest).
- **The high-intensity and low-intensity interval training method and the repetitive training method were adopted for the first and second experimental groups.**
- The researcher used intensity undulation (2-1) for both groups.

2-7-3 Post-tests for the research sample: -

The post-tests and measurements of the research sample were conducted on Wednesday (2/5/2025) in the closed sports hall of the specialized center in Al-Jabaish district after the completion of the period of applying the exercises prepared by the researcher within the two training programs that took (10) weeks. The researcher was keen to provide the same conditions of the pre-tests and measurements and their procedures followed to conduct the post-tests and measurements.

2-8Statistical methods:

The researcher used statistical methods that helped in processing the results and testing the research hypotheses through the use of the statistical package.YesThey are:

- Arithmetic mean. Standard deviation. Coefficient of variation. Pearson correlation coefficient.

a testT)) for correlated samples. T)) test for independent samples. Percentag

([2]) Saif Shaker Kamel: The effect of Tabata exercises on the level of some elements of physical fitness and the accuracy of performing the blocking wall skill in volleyball, European Journal of Sports Science Technology, Volume 13, Issue 46, 2023, p. 14.

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-1 Presentation and analysis of the pre- and post-test results of physiological indicators measurements and anaerobic capacity test for the first experimental group.

Table (5)

Shows the values of arithmetic means, standard deviations and the value of (T) Calculated for physiological measurements and pre- and post-anaerobic capacity tests for the first experimental group

The result	Sig	T calculated	(After me)		(Before me)		Unit of measurement	Processors Measurements
			A	S	A	S		
moral	**0.000**	**14,016**	**6.264**	**498,714**	**5.307**	**455,094**	**Unit/L**	**Enzyme concentration ratioLDH**
moral	**0.001**	**5.628**	**0.025**	**7.16**	**0.0448**	**7.24**	**-**	**Enzyme concentration ratioCPK**
moral	**0.000**	**19,075**	**4,503**	**384,571**	**1.611**	**319,257**	**Unit/L**	**Blood pH**
moral	**0.031**	**2.793**	**3,207**	**183,428**	**2.263**	**178,618**	**against**	**heart rate**
moral	**0.000**	**9,739**	**2.146**	**104,888**	**2.863**	**91,328**	**kg.m/s**	**anaerobic phosphagen capacity**
moral	**0.001**	**6,028**	**2.194**	**59,141**	**2.517**	**50,081**	**kg.m/s**	**anaerobic lactic capacity**

- Note that the valuet-tabulary 1.943 at 6 degrees of freedom and 0.05 significance level

By reviewing the data in Table (5), the results of the post-tests showed the presence of statistically significant differences between the pre- and post-test measurements for all the variables under study, in favor of the post-test, which indicates the effectiveness of the training program or the effort exerted in bringing about clear physiological changes.

3-2 Presentation and analysis of the pre- and post-test results of the physiological indicators and anaerobic capacity test for the second experimental group..

Table (6)

Shows the values of arithmetic means, standard deviations and the value of (T) Calculated for physiological measurements and pre- and post-anaerobic capacity tests for the first experimental group

The result	Sig	T calculated	(After me)		(Before me)		Unit of measurement	Processors Measurements
			A	S	A	S		
moral	**0.000**	**10,843**	**9.281**	**501,142**	**6.725**	**456,285**	**Unit/L**	Enzyme concentration ratioLDH
moral	**0.001**	**5,791**	**0.017**	**7.13**	**0.043**	**7.23**	**-**	Blood pH
moral	**0.000**	**13,763**	**3.598**	**378,582**	**2,429**	**320,285**	**Unit/L**	Enzyme concentration ratioCPK
moral	**0.005**	**4,370**	**2.478**	**182,857**	**1.670**	**179,047**	**against**	**heart rate**
moral	**0.000**	**9.381**	**2,439**	**102,571**	**3,387**	**90,142**	**kg.m/s**	**anaerobic phosphagen capacity**
moral	**0.001**	**6,747**	**2,811**	**58,087**	**2.193**	**49,142**	**kg.m/s**	**anaerobic lactic capacity**

- Note that the valuet-tabulary 1.943 at 6 degrees of freedom and 0.05 significance level

By reviewing the data in Table (6), the results of the post-tests showed the presence of statistically significant differences between the pre- and post-measurements in all the variables under study, and these differences were in favor of the post-measurements, which indicates the effectiveness of the training program or the effort exerted in bringing about tangible physiological changes..

3-3 Presentation and analysis of the post-test results of physiological indicators, anaerobic lactic capacity test, and defensive performance endurance in volleyball for the two experimental groups.

Table (7)

Shows the values of arithmetic means, standard deviations and the value of (T) Calculated physiological measurements, anaerobic lactic capacity tests, and defensive performance endurance in volleyball for the two experimental groups.

The result	Sig	T calculated	(After me)		(Before me)		Unit of measurement	Processors / Measurements
			A	S	A	S		
Non-moral	**0.224**	**1.283**	**9.281**	**501,142**	**6.264**	**498,714**	**Unit/L**	Enzyme concentration ratioLDH
Non-moral	**0.117**	**1.689**	**0.017**	**7.13**	**0.025**	**7.16**	**-**	Blood pH
moral	**0.017**	**2.753**	**3.598**	**378,582**	**4,503**	**384,571**	**Unit/L**	Enzyme concentration ratioCPK
Non-moral	**0.369**	**0.933**	**2.478**	**182,857**	**3,207**	**183,428**	**against**	**heart rate**
Non-moral	**0.084**	**1.887**	**2,439**	**102,571**	**2.146**	**104,888**	**kg.m/s**	**anaerobic phosphagen capacity**
Non-moral	**0.496**	**0.701**	**2,811**	**58,087**	**2.194**	**59,141**	**kg.m/s**	**anaerobic lactic capacity**

-Knowing that the valuet-tab 2.179 at 12 degrees of freedom and 0.05 significance level

By reviewing the results of Table (7), we note that all variables did not show significant statistical differences between the two experimental groups, with the exception of the enzyme.CPK, where the average for the first group was (384.571 units/liter) compared to (378.582 units/liter) for the second group, and the value was (t = 2.753) with a significance level of (Sig = 0.017), which is a significant difference in favor of the first experimental group.

RESULTS AND OBSERVATIONS:

By reviewing the results of Tables (5-6), it is clear that there are significant differences in all study variables in favor of the results of the post-tests and measurements. The researcher attributes these differences to the nature of the implemented exercises that were prepared by the researcher and applied by the members of the two experimental groups, as these exercises were characterized by the fact that most of them were complex (physical-skill) and others were only skill-based, and the application of each of them required relatively long periods of time, targeting some elements of physical fitness that would affect the study variables, in addition to some components of the two anaerobic energy systems under study.,As for Table (7), we note that there are no significant differences inAll variables, despite minor statistical differences, except for the enzyme concentration ratio.CPK in the blood, and the researcher attributes these statistical differences to the variation in the intensity ratios used in the two training programs for the two experimental groups, as the first experimental group applied training units with maximum intensity (90-100%) at a greater rate than the second group, which in turn applied training units with submaximal intensity (80-89%) at greater rates than the first group, and medium (70-79%) were equal between the two groups, in addition to the difference in the ratios of the other components of the training load (volume, density) that are regulated according to the training intensities used in the two training programs, as well as the nature of the exercises implemented, as they are non-oxygen exercises that greatly and positively affect the mechanism of the energy production systems. (Raisan Khuraibat) states that non-oxygen capacity exercises work to supply the working muscles with non-oxygen energy in a better way during performance, and the limited possible continuity of these exercises ranges from 20-50 seconds ( ) . The researcher believes that the difference between the percentages of the five training intensities used has greatly affected the research indicators. The researcher attributes these simple statistical differences to the fact that the members of the second experimental group underwent a training program according to training intensities targeting the lactic system at a greater rate than the intensities used in the training program of the first group. (Jabar Rahima) states, “The use of high intensity, which ranges between 80-90%, and its improvement is linked to directing the components of

the training load in a way that makes the accumulation of lactic acid in the muscles greater than the rate of its disposal, and through it, it is possible to reach functional adaptations to tolerate oxygen deficiency, which enables the athlete to maintain a high level.")This is what we notice when looking at the times of the exercises applied at that level of training intensity, which causes a greater accumulation of lactic acid in the blood when performing them. As a result of repetition and continuity in training, the players' ability to exert high physical effort for a relatively long period of time increases without a decrease in the level of performance efficiency. Amin Khazal states that performing exercises ranging in time from (20 seconds to 4 minutes) works to tolerate high levels of metabolic acid, as blood lactate levels reach more than 12 mmol/L.)This indicates an improvement in the players' ability to endure performance and increaseinEnzyme concentration ratioLDH in the blood, which works to convert pyruvic acid resulting from the anaerobic breakdown of glycogen during high physical effort into lactic acid, in addition to a decrease in the blood pH value, which indicates an increase in the accumulation of hydrogen ions H+ in addition to lactic acid in the blood. All of these indicators indicate an improvement in the physiological condition of the players and an increase in their ability to endure performance and exert great effort for longer periods during play.In addition to helping the heart muscle supply the working muscles with their necessary requirements, the development of the heart muscle helped increase the volume of blood pumped to the muscles.(Al-Kufi 2024)( )This is what we also notice on the members of the first experimental group, but with smaller results with insignificant differences that do not significantly affect the level of performance between the two groups, i.e. they are not sufficient to distinguish one group from the other. The researcher attributes the reason for these simple differences in the aforementioned indicators to the fact that the members of the first experimental group underwent maximum training intensity targeting the phosphagen energy system to a greater extent than the members of the second group, and this in turn led to an improvement in the mechanism of that system's work in supplying the working muscles with the energy needed to continue the effort, i.e. the player's ability to perform stronger and faster in the first seconds of the effort (test) improved, in addition to the speed of rebuilding.ATP This delays the increase in the percentage of contribution of the lactic energy system to the work during the exerted effort and reliance on it completely, which maintains the continuation of the speed of performance. This is confirmed by the study (Erkan, Ibrahim) "It was noted that well-trained individuals show greater use of the phosphagen system (ATP-PC) at the beginning of the effort, which reduces the early reliance on lactic glycolysis" ( )This is an appropriate explanation for the statistically significant difference in the concentration of the CPK enzyme in the blood."As the enzyme levelscpkIt increases after performing physical efforts in order to accelerate energy production in muscular effort.(Kazem, Muhalhal 2024)( ) Being the main cofactor in the chemical reaction that occurs in the phosphagocyte system for the decomposition ofATP and energy production in addition to its reconstruction in the reverse reaction of the decomposition of creatine phosphate CP, where it maintains a constant level despite rapid consumption until exhaustion. Ahmed Youssef states that training the phosphagen system aims to improve some physical abilities and the speed of performance of technical and tactical skills.)This is what was observed in the members of the first experimental group, as they were distinguished by a higher speed in performance with a better physiological state. As for the pulse rate index, we note that the post-results of the two groups are very close and largely homogeneous, which indicates that both training programs had a positive effect on that index, and either of them can be adopted.,As for the indicators of anaerobic capacity (phosphagonic anaerobic capacity, lactic anaerobic capacity), by reviewing the results of the two tables mentioned above, we note that both groups achieved high scores in the post-test when compared to their pre-test results, and there are no significant differences between them in the post-test. This indicates the quality of the two training programs applied by the research sample members, in addition to the possibility of the exercises in achieving the goals for which they were set. We note the improvement of the anaerobic phosphagonic capacity, which depends in its measurement on the value of the highest vertical jump that the player can achieve. That is, the better the explosive power is, the more positively it reflects on the phosphagonic capacity. This is what prompted the researcher, during his preparation for the exercise and in many of them, to target the elements of physical fitness that would affect the test results, including explosive power. As for the lactic capacity, the development that occurred in it indicates an improvement in the endurance capacity of the muscles of the lower extremities in resisting the accumulation of causes of fatigue (lactic acid,H+) resulting from continuing to perform for 60 seconds without a significant drop in performance speed. This indicates that the training intensity used, despite the difference in their proportions, has achieved almost the same results with very simple statistical differences in favor of the first experimental group in anaerobic capacity. Adel Al-Basir states that the ability to resist fatigue when working at a high degree of speed means the development of the body's efficiency in producing energy through the anaerobic path and maintaining high rates for the longest possible period of time.).

From the above, the statistical results indicate that both experimental groups achieved positive results in the post-test compared to the pre-test in all physiological indicators and anaerobic capacities. This indicates the effectiveness of the two applied training programs, in addition to the quality of the exercises used in them according to appropriate training intensities that

achieved some of the goals sought by the researcher if they were able to bring about the required adaptations. When comparing the post-test results of the two groups with each other, we note that there are statistical differences, but they are not significant in all research variables, except for the enzyme concentration ratio.CPK in the blood, which indicates that the intensity ratios used in the training program for the first experimental group gave better results than the ratios applied in the training program for the second group. This means that the superiority of the two programs was in favor of the program of the first experimental group, which is more integrated than the other program, despite the slight differences between them.

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