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THE EFFECT OF CRITICAL SPEED TRAINING ON THE SPEED OF PARTS OF THE RACE ON SPEED ENDURANCE AND THE ACHIEVEMENT OF THE 800M SWIM

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Abstract

The purpose of this paper istopreparing critical speed exercises at the speed of the parts of the race for the 800-m swimmers for the applicants, identifying the effect of the critical speed exercises at the rates of the speed of the parts of the race on the endurance of the speed and achievement of the 800-m swimmers for the applicants.The researchers used the experimental method in a one-group style because it is the appropriate approach to solve the research problem and achieve its objectives, and the research community was identified with swimmers for a distance of 800 m, from the swimmers of clubs in the Middle Euphrates governorates for the sports season 2020-2021, who numbered (6) swimmers for a distance of 800 m, distributed among clubs (Kufa, Najaf, Mashkhab, Diwaniyah, Dagara, Karbala, Hilla) and the researcher chose them completely for the experiment.

As for the most important conclusions, they are: The validity of the rates made by the researchers for the critical speed law for the first (400 m) and the second (400 m) distances. The codification of critical speed exercises with the rates of race parts showed that there is a contribution to the aerobic and anaerobic aspect through its reflection on the endurance of speed and achievement The first (400 m) equation contributed to the development of the anaerobic side represented by (speed

endurance), and the second (400 m) equation contributed to the development of the aerobic side represented by (achievement).As for the most important recommendations, they are Adoption of the critical speed equations divided into two halves for swimming competition exercises (800 m - 1500 m), the need to take into account individual differences when applying the principle of critical speed to different groups of athletes, the need to apply the principle of critical speed to the various team or individual games.

Introduction:

Scientific development has added many new and modern methods in line with the nature and capabilities of the trainee through the trainers' quest to choose the best and latest methods that suit the specialized activity. Accordingly, scientific research has tended to study various sciences, including chemistry, biomechanics, anatomy and sports physiology, and employing them to serve the science of sports training in order to raise the level of athletes in all sports because of the fundamental importance of these sciences in developing and evaluating training methods.In addition, knowledge of the responses and adaptations that occur during the practice of sports activity, with the aim of achieving and investing the specificity of training related to the type of activity in order to reach a direct impact to raise the level of skill, physical, occupational, planning, psychological and mental.

Swimming is one of the main competitions in discovering this modernity in sports training, which is affected by all elements of physical fitness and aspects of physiology through the development of the work of muscles and body organs and their reflection on the physical side of the competition. The nature of the international numbers achieved in the 800m swimming competition indicates the presence of contribution ratios between the aerobic and anaerobic system, so proper planning is required to prepare training based on the integration of the two energy systems to improve the achievement of local athletes to keep pace with the international achievements.The two researchers relied on the critical speed index for swimmers prepared by the scientist (Ginne) from an applied test on a 400-meter freestyle swimmer, which he called (CSS) the swimmer's critical speed, as the critical speed index is one of the latest training applications that use exercises in which there is an overlap Between the aerobic and anaerobic energy systems, and this is commensurate with the nature and characteristics of the game to create a state of functional adaptation and improve energy production systems and improve the achievement of advanced swimmers 800m.

All this is worthy of study and research, especially if we know that there are those who do not pay attention to the effectiveness of legalizing critical speed exercises, and thus the importance of research in preparing critical speed exercises is evident, as the researcher believes that it will have an impact on the endurance of speed, as well as the achievement of 800m swimmers for applicants, as These exercises will improve the swimmer's functional and physical ability, so the researchers wanted to delve into this experiment.

Research problem:

Because the world numbers and the development in achievement for world swimmers and that this development is attributed by the researchers to the trainers' use of modern training methods, and because the effectiveness of swimming 800m is related

to both aerobic and anaerobic systems, so the researchers wanted to use critical speed exercises at rates of speed of parts of the race, which is one of the modern applications in the training year, which Through which the researchers try to find out the sequential responses associated with the endurance of speed and the achievement of swimming 800m

Through the foregoing, the research problem can be summarized by the following question: Do the critical speed exercises with the speed rates of the race parts have a positive impact on the endurance of speed and the achievement of 800m swimming for the applicants?

Research objective:

- Preparing critical speed exercises at the speed rates of the parts of the race for the 800m swimmers for the applicants,
- To identify the effect of critical speed training on the speed rates of the parts of the race in endurance of speed and achievement of the 800m swimmers for the applicants.

Research hypotheses:

That there is an effect of critical speed training on the speed of the parts of the race in the endurance of speed and achievement of the 800m swimmers for the applicants.

Research fields:

- Human field: The swimmers of the middle Euphrates governorates clubs for the 800m event for the applicants
- Time field: (2/1/2021) to (15/5/2021)
- Spatial field: Al Shaab International Swimming Pool, Wajh Al-Dunya Laboratory for Pathological Analyzes.

Research methodology and field procedures:

Research Methodology:

The problem, its nature and the objectives of the research are what determine the type of method used, so the researcher used the experimental method in a one-group style because it is the appropriate method to solve the research problem and achieve its objectives.

Community and sample research:

The research community was identified with swimmers for a distance of 800 m, from the clubs of the middle Euphrates governorates for the sports season 2020-2021, whose number is (6) swimmers for a distance of 800 m, distributed among the clubs (Kufa, Najaf, Mashkhab, Diwaniyah, Dagara, Karbala, Hilla) and the researchers chose them Fully for the experience (comprehensive inventory community).

Devices, tools and means used in the research:

Means of data collection:

1- Arabic and foreign sources and references.

2- Personal interviews.

3- Tests and measurements.

4- Special forms for recording the results of the tests for the players.

Tools and devices used:

• Computer (Laptop) type Lenovo.

• A mobile tape device to measure the boundaries of the swimming area.

• Sports stopwatch type (Casio) number (3).

• One (1) Canon photocopier.

Field research procedures:

Tests and measurements used in the research:

Speed Endurance Test (50m) Freestyle:[(1)]

- The purpose of the test: To measure the endurance of speed.
- Description of performance: When the laboratory is ready on the starting line, after hearing the signal, it starts with increasing acceleration to cover the 50-meter distance at its maximum speed, and when it reaches the end of the basin, the timing is stopped.
- Recording: The time to travel the distance is measured from the moment of departure to the end of the distance to the nearest tenth of a second.

800m Swimming Test: [(2)]

- The purpose of the test: measuring the achievement of 800m swimming.
- Description of performance: The laboratory is launched from the starting cube in the pool. The laboratory swims in a free-swimming method for a distance of 800 m, during which it cuts 16 runs.
- Recording method: The time is calculated from starting until the end of the distance to the nearest 1/100 second.

The exploratory experience of the tests used in the research:

The researchers conducted the exploratory experiment for the tests used on (4/1/2021) on the research community, in the (Olympic Al Shaab) swimming pool at four in the afternoon. The purpose of the exploratory experiment for the tests is as follows:

1- Ensuring the validity of the swimming pool and the tools used and their suitability for the tests.

2- Preparing the auxiliary work cadre, as well as identifying the difficulties they may face.

3- Knowing the extent of the testers' readiness to perform the tests.

4- Measuring the time of the tests used.

5- Knowing the suitability of physical exercises for the tested individuals and their applicability.

6- Extracting the times of the special distances in order to ration the critical speed and the time of the critical speed exercises at the race speed rates.

7- Knowing the field difficulties that the researchers may face during the application of the program vocabulary.

8- Ensure the safety of the devices related to the variables.

Main Experiment Procedures:

Pre-tests:

The two researchers conducted tribal tests on the research community on (10/1/2021).

Preparation of exercises according to the critical speed applications of swimming:

Identify the intensity of the exercises according to the critical speed:

The training intensity was determined according to the critical speed principle of the swimmer from the application of the following critical speed equation:

- We extract the time of 50 m and 800 m in one session (with a passive recovery for 30 minutes), and the distance of 800 is divided into two parts, and we extract the time of the first part (400 m) and the time of the bending part (400 m) from the total distance.
- We use the law of critical speed $=\frac{m1-m2}{n1-n2}$(3)
- • Then we calculate the time of the first 400m from the part of the total race, which represents in the equation the second time - 50m is the first distance ÷ time for the second 400m - time for 50m, knowing that the total time for the 800m race is (600.050 seconds).
- Note that the time for the first (400m) distance is (291) seconds, and the time for the second (400m) distance is (309.) seconds.

$$\frac{\mathbf{50-400}}{\mathbf{32-291}}$$

350/(265.88)=1.35 m/s Represent (1.35 m/s) is the critical speed of the first 400 m swim.

- Then the critical speed training vocabulary was codified and training duties were given for all partial distances, for example (50m) as follows:
  50/(1.35)=37.03 seconds and the critical speed for a maximum distance of 50 m is 100%.
- Through this, the critical speed equation is applied in order to extract a new training critical speed through which the exercises are employed to develop the variables investigated.
- Then the researchers extracted the critical speed for the second part of the race, as follows:

$$\frac{\mathbf{50-400}}{\mathbf{32.01-309.471}}$$

= 350/277= 1.26 m/s, which represents the critical speed of the second swim of 400 m (the total race).

- Through this, the vocabulary of critical speed exercises was codified and training duties were given for all partial distances, for example (200 meters) from the second part of the race as follows:-

200/(1.26)=158.73 seconds and the critical speed for a maximum distance of 200 m is 100%.

- The exercises consisted of three training units per week, swimming on days (Sunday, Tuesday and Thursday).
- started applying exercises according to the critical speed applications for swimming on 12/1/2021 until 23/3/2021.
- The duration of the trainings was carried out within the period of special preparations and semi-competitions, 10 weeks, and an average of 30 training units within three months.
- The duration of the training unit from the main part (28-40) minutes.
- The intensity used in the exercises for partial distances through the product of dividing the partial distance by the critical speed of the distance concerned ranged between (85-105%) of the critical speed of the athlete.
- The rest periods used between repetitions depend on the heart rate, as they reach between to ensure that the contestant remains at or near the lactic threshold.
- The training load ripples in a ratio of (1:2).
- Setting the size of the training load in proportion to the intensity of the load used and the ability of swimmers.

Post-tests:

The researchers, with the help of the assistant work staff, conducted the post-tests of the research community after the completion of the application on (26/3/2021).

Statistical methods: The search data was processed through the Statistical Package for the Social Sciences (SPSS).

Presentation, analysis and discussion of the results:

Presenting the results of the pre and post-tests for the variables under research and analysis:

Table (1) shows the arithmetic means and standard deviation in the results of the pre and post-tests for the variables under study

Variables	Measuring unit	Pre-test		Post-test		T value	level Sig	type Sig
		Mean	standard deviation	Mean	standard deviation			
speed endurance	Sec	31.32	0.822	29.36	0.528	4.904	0.001	sig
Achievement of the 800m swim	Sec	600.0050	5.325	588.871	2.524	7.398	0.000	sig

Discuss the results:

Through what was presented in Table (1), we note that there are significant differences in the tribal and remote tests in favor of the post-tests. The researchers attribute that the reason for the differences that appeared on the members of the research sample in the speed endurance test is due to what the researchers prepared

from exercises codified in a scientific form, in terms of the components The training load that was applied to the research group, where these exercises were codified according to the principle of critical speed in developing the physical ability to exert force and developing the ability to contract and relax for a relatively long period represented by the time of cutting a test distance (50m swimming), which indicates an improvement in the interactions between endurance and muscular capacity And the continuation of speed to obtain the best time to travel that distance, which serves to produce a speed that matches the trajectory of motor performance, which affected the continuation of force when contracting and diastolic in the muscles of the arms and legs and its proportion to the movement speed required to travel the distance of the speed endurance test, and (Jamal SabriFarag) sees it bearing Speed refers to "the ability to maintain speed in the presence of fatigue without decreasing that speed" [(4)] , Therefore, athletes in speed-power sports must train the ability to maintain high levels of speed even when tired, as the researchers believe that special endurance is very important and necessary for many sports activities that require performance of maximum and sub-maximal intensity, and critical speed exercises used Contributed to the development of the physical capabilities of the swimmers, as the repetition of training loads according to this principle leads to qualitative reactions and responses that result in the so-called adaptation for the physiological devices and the physical ability to be developed so as to make the athlete resist fatigue and treat the accumulation of quantities of lactic acid in the muscles and blood [(5)], This means that the development of the swimmers sample members was noticeable as a result of the adaptations resulting from the continuation of performance according to the rate of speed and repetition of that in the units increases the ability to maintain speed rates for longer periods and in a shorter time and this increased the individual's ability to endurance speed for swimmers and this was confirmed by (Issam Abdel Khaleq) sees that "the individual's ability to maintain speed in conditions of continuous work and to develop the ability of their resistance to fatigue when carrying a high degree of intensity (75%-100% develops their own endurance capabilities)"[(6)] , Thus, the critical speed exercises prepared by the researcher with the rates of the parts of the race have worked to increase the functional efficiency, which developed the special physical abilities. Therefore, this development was reflected in the functional and physical aspect on increasing the ability to invest the technique, which is mainly associated with physical abilities, which led to an improvement in the length and rate of the stroke. For the swimmer because the exercises were codified in a modern way that makes the athlete swim at a constant speed while performing his training duties for partial distances.

The researchers also attribute the development of (speed endurance) ability as a result of the critical speed exercises with the speed ratios of the parts of the race-prepared by the researchers, in which the physical aspects, including speed endurance, were targeted when applying them, as they were keen that the goal at the beginning of the section of the training unit is to develop speed endurance through training. On the special partial distances (50 m), because the endurance of speed depends largely on the safety and purity of the nerve impulses, as well as following the principle of undulation in the implementation of training loads was one of the most important factors that helped the clear development in the endurance of speed, as the researchers focused on that no the training loads are at the same pace, but were performed at different speeds, higher and lower, and the same speed of competition. In order to

meet the needs of these requirements, the trainer must include in his training curriculum the use of a variety of stresses on an ongoing basis [7].

We also note that the values of the variable (Achievement) have shown significant differences between the pre and post-tests for the members of the research sample, and that the moral difference that occurs for achievement (800 m) is a logical result of the moral results of the responses of the variable bearing the speed that was previously discussed, as the work focused on the implementation of exercises Critical speed in line with the correct scientific foundations, as the exercises were divided into distances at the rates of the race parts based on a new division of critical speed, as the race was divided into two halves and then extracted the target time for that distance, as the critical speed drills and with short rest periods for special distances from a distance The race and the adoption of this speed in determining the intensity of the exercises led to an improvement in the swimmer's endurance and at a faster pace than the rhythm of the competition, and there had to be repetitions to train the special speed and endurance of the special speed and with high intensity with the technique of rest times between repetitions in order to develop these special abilities, as the researcher's goal of the exercises Anaerobic according to the critical speed at the rates of the parts of the race used to develop speed and endurance of force and improve the sense of the correct rhythm of the steps and to continue with it, so it is necessary to allocate a period of An adequate space between repetitions so that the swimmer can maintain the desired rhythm when swimming during these exercises. "The great ability to produce energy through anaerobic glycolysis, in addition, the mechanism and activity of the muscles and the nervous system have improved, and the coordination between them has become good, and this is what appeared through the coordination of Movements between the parts of the body related to the continuation of performance for a certain distance from the race distance, so these results were consistent with what happened in the development of endurance of speed for the members of the research sample. He swims on it during his performance, which makes it easier for him to shorten the time with the physical and physiological adaptations of the players.

This is what was focused on in the exercises that were applied to the members of the research sample, which included distances less than the racing distance and increasing the speed in a larger way the smaller the distance, which included exercises for distances extending between 50-350 m and according to the critical speed at the rates of the parts of the race to develop your endurance capabilities and with high repetitions Relatively and almost severely, which led to the development of a level of performance, which was reflected in the performance of the maximum possible degree of the speed of competition and for the longest possible period of time, resulting from the effect of special exercises for special endurance abilities according to the specified time indicator of the required distance included in the exercises in which the researchers focused on achieving the best The level of the swimmer and the high intensity to cut the distance of the competition.

Conclusions and Recommendations:

Conclusions:

Based on the research results that were reached within the limits of the research community, the following conclusions were reached:

- The correctness of the averages made by the researchers for the law of critical speed for the first (400 m) and the second (400 m) distances.
- The rationing of critical speed exercises with the rates of race parts showed that there is a contribution to the aerobic and anaerobic aspect through its reflection on the endurance of speed and achievement.
- The first (400m) equation contributed to the development of the anaerobic aspect represented by (speed endurance).
- The second (400m) equation contributed to the development of the aerial aspect represented by (achievement).

Recommendations:

- Adoption of the critical speed equations split into two halves for swimming training exercises (800m - 1500m).
- The need to take into account individual differences when applying the principle of critical speed to different groups of athletes.
- The necessity of applying the principle of critical speed to the various team or individual games.
- Taking into account the lifestyle when using studies related to antioxidants from sleep, food and rest.

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Appendix (1)

Shows a sample of the training units during the special preparation period for the research sample swimmers

h	week	days	Exercise	intensity %	Exercise time	Maximum time according to critical speed	Repetition	Comforts		Total exercise time	tim tra
								between iterations	between exercises		
	first + second	Sunday 2021/5/16	50 m	88	42 s	S 37.03	2	15 s	120 s	m 600	
			m 100	86	s 46.2	s 74.07	8	20 s	140 s	m 800	m
			m 200	85	174.28 s	148.14 s	3	25 s	---	m 600	
		Tuesday 2021/5/18	m 150	88	126.26 s	111.11 s	6	20 s	120 s	m 900	
			200 m	85	174.28 s	148.14 s	3	25 s	140 s	m 500	
			m 250	85	233.42 s	198.41 s	2	35 s	---	m 600	
		Thursday 2021/5/20	300 m	85	280.1 s	238.09 s	4	35 s	160 s	1200 m	
			350 m	85	326.88 s	277.77 s	2	40 s	---	m 700	