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Special Exercises to Develop the Endurance of Speed and its Effect on Some Physiological Indicators and the Achievement of Running 1500 Meters

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Abstract:
The aim of the research is to prepare suggested exercises to develop the endurance of speed and the achievement of running 1500 meters for the members of the research sample and to identify the effect of using the proposed exercises to develop the endurance of speed in some physiological indicators and the achievement of running 1500 meters, and the supposed of the research was that there were statistically significant differences between the pre and post results for the control and experimentalgroups.The researchers used the experimental method in a controlled manner (experimental + control) for its suitability and the nature of solving the research problem, as this method is one of the most accurate, best and most efficient types of approaches in reaching accurate results, as the research sample was determined By deliberate selection, as the researchers determined the research sample,which are some of the advanced runners according to the classification of the International Association of Athletics Federations, as the research sample included (10) runners. They were distributed randomly (by lottery) into two control and experimental groups, each group consisting of (5) runners. The control group used the regular training method while the experimental group used the same old training way except endurance speed exercises It was prepared by the researchers and implemented by the assistant team. Physiological tests were conducted, including the maximum consumption of oxygen and lactic acid, and physical tests that included an endurance test of 1800 meters and an achievement test of 1500 meters on the members of the research sample. That Shows development of achievement by a large percentage, significant differences appeared between the two research groups in the post-test of variables.The concentration of lactic acid in the blood, the maximum oxygen consumption and the achievement of running (1500) was better in results for the experimental group, and that because of the special speed endurance exercises prepared by the researchers than the exercises used by the control group.
Keywords: Endurance, Physiological Indicators and 1500 meters Running.

Chapter one:

Introduction:

The huge development in the sports side, breaking numbers and achieving titles at the global level in recent decades did not come randomly, but was the result of the application of research, studies and scientific foundations and putting them in practical reality, so levels and capabilities rose in physical, skill and psychological abilities through employing the foundations and principles of modern sciences in physical education as a science of training Physiology, statistics, biomechanics, sociology and sports medicine, thus raising the athletic level and reaching the top of achievement.

The (1500m) event is one of the very exciting events in the Olympic races, as it occupies a prominent and important position in the Olympic programs, as it is practiced with less than maximum intensity and has become at the present time one of the fast races in the track and field Games, where the last world record was recorded with 3 minutes 26 seconds 00 part of a second.

The physiological aspect takes an important aspect during the legalization of the training load, knowing the intensity of training, especially the maximum consumption of oxygen, which

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indicates the adequacy of the runner's physical fitness, and lactic acid, the biochemical indicator that is formed as a result of the intensity of performance in the muscles, and then concentrates in the blood after a period of time during rest, Nowadays, lactic acid is used to measure exercise intensity and to evaluate training programsAnd coaches use the correct method of training in all sporting events, and among these events is running medium distances that have an important impact on the internal functional changes of the runner and raise the level of his efficiency, whether physically, functionally or physiologically, hence the importance of research in preparing special exercises to develop endurance speed and its impact on some indicators Physiological and the achievement of running 1500 meters

Research problem:
By tracking the results of the Iraqi 1500m runners and watching them, whether in international or local championships, we find that they did not achieve the desired results, including reasons related to poor speed endurance training and the lack of monitoring of physiological indicators such as the accumulation of lactic acid and the maximum oxygen consumption, which give a real assessment of the athlete's condition, especially long runs Despite the opportunity for many times and the loss of good results and expensive medals for the country, so the researchers decided to prepare special exercises to develop endurance to speed and monitor (lactic acid and the maximum oxygen consumption) as a true assessment of the runners 1500 meters.

Research Aims:
1- Preparing suggested exercises to develop the endurance of speed and the completion of the 1500-meter run for the research sample members.
2- Recognizing the effect of using the proposed exercises to develop speed endurance on some physiological indicators and the achievement of 1500m run.

Hypotheses:
There are statistically significant differences between the results of the pre and post tests for the control and experimental groups for some physiological indicators and the achievement of 1500 meters ran.

Chapter two:
The relationship of lactic acid to endurance speed:
The speed training and repetition lead to the formation of lactic acid in the muscles through the implementation of the runner training at maximum intensity or less than the maximum, i.e. from (85 - 100%) of the maximum intensity of the training distance and the duration of this distance is about more than 30 seconds and less than 4 minutes depending on The peculiarity of each activity is that lactic acid collects in the runner's muscles and blood with giving repetitions with relatively short intervals of rest in which the runner aims to achieve the same distance in approximately the same time in the presence of lactic acid in the muscles, and this means that all training with these specifications collects lactic acid in the muscles of the runner His blood and such training is called speed endurance,That is, the anoxygenic training with lactic acid system, as the training is carried out with insufficient oxygen in the organs and organs of the runner's body to produce energy. Therefore, the runners who are well trained in lactic acid training with high concentrations in the muscles and blood, the opportunity to achieve achievements is present and continuous as long as the runner has the ability to withstand the deficiency Oxygen and its attendant chemical changes within the runner's body organs and systems, and the world records achieved in the 1500m competition can only be achieved through the use of lactic acid system exercises and various training methods, including (hypoxia) training and height training with high training volumes So that the functional organs can adapt to the lack of oxygen and the accompanying physiological and

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chemical changes in the muscles and blood, including the accumulation of lactic acid with high concentrations in the muscles and blood for a relatively long period and without a decline in performance during the run as well as the use of good nutrition, and appropriate recovery methods that lead to more Functional adaptations for runners improve achievement (1: 12-13).

The importance of maximum oxygen consumption in middle-distance running:

Determining the maximum amount of oxygen consumption derives its importance as the result of several important physiological processes in the body, which are divided into two main processes, the first one is the process of delivering oxygen to the muscles, and the respiratory, circulatory system and blood participate in this process, and the second process is the process of consuming oxygen in the muscles, which is the most important process and depends on What training does in the structure of the muscle so that it can absorb a greater amount of oxygen and consume it as a result of an increase in the myoglobin, mitochondria, capillaries and enzymes, so the measure of the maximum oxygen consumption is an integrated measure of the four most important vital organs during performance, namely, the respiratory system, the circulatory system, the muscular system and the blood, Therefore, physiological laboratories depend on it to evaluate the athlete's training and physiological condition(2:64).

Chapter three:

Research Methodology:

The researchers used the experimental method in a controlled manner (experimental + control) for its suitability and the nature of solving the research problem, as this method is one of the most accurate, best and most efficient types of methods in reaching accurate results.

The research sample:

The research sample was determined by intentional selection, as the researchers selected the research sample, who are some advanced runners according to the classification of the International Association of Athletics Federations, as the research sample included (10) runners. They were distributed randomly (by lottery) into two control and experimental groups, each group consisting of (5) runners.

Equipment, tools and means used in the research:

1- Arab and foreign sources.
2- The World Wide Web (Internet)
3- Observation and experimentation.
4- Lactic acid meter
5- Measuring kits.
6-Fitmate prodevice.
7- Treadmills.
8- A personal electronic scale with a unit of measurement (kg) and its parts.
9- Manual stopwatch with the possibility of measuring more than one time during the race (2 pcs).
10-Laptop brand (hp).
11-Medicine tissues for cleaning breathing masks.
12- An iron tape to measure the length.
13-Sanitizer to sterilize breathing masks.

Tests:

1- Achievement test of running 1500 meters.

Test name: 1500m run.
Purpose of the test: to measure the achievement of running 1500 meters.
Tools used: running track, stopwatches, registration forms.

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performance: All players are tested together. The test started when the players heard the instruction (take your place) as they take the starting position from standing. Then the signal to start and take off is to run around the track (3) laps and (300) meters to cover a distance of 1500 meters.
Registration: The time of each runner is recorded in the registration form in (minutes and parts of a second).

2- Achievement test of running 1800 meters.
Test name: 1800m run.
Purpose of the test: Special endurance test.
Tools used: running track, stopwatches, assistants, registration form.
Performance: All runners stand together behind the specified starting line (high standing position) and at the start signal, the runners set out to cross the test distance 4.5 four and a half rounds, and upon reaching the finish line the recording watches are stopped.
Registration: The recorder records the time from the moment of the start of the test signal until reaching the finish line, and records the time in minutes and seconds to the nearest tenth of a second.

3- Measurement of the concentration of lactic acid in the blood after physical exertion.
Test name: Measuring the concentration of lactic acid in the blood after physical exertion using (LACTATE PRO TEST METER) device.
Tools used: Two devices of (Lactate Pro LT - 1710) manufactured by the Japanese company (Arakray), two needle drills, (2) check strips, (2) calibration strips, Test strips, medical cotton, sterile materials, two small hand towels, registration form.
Performance: After the tested runner finishes performing a test running a distance (1500 m), the level of lactic acid concentration in the blood is measured after the effort, that is, after performing the test with a time of (5) minutes, and this period is considered appropriate to ensure the transfer of lactic acid from the muscles to the blood (27:3), and the researchers followed the following steps to conduct the test:
1- Configure the device to work by:
A- Placing the check strip, and then removing it.
B- Putting the calibration strip, and then removing it.
C- Put the test strip and install it in the device.
2- Sterilization of the finger from which blood is drawn with sterile materials, preferably the index finger
3- Prick the tip of the finger with the needle drill supplied with the device.
4- After the blood comes out of the finger, a drop of blood is placed on the measuring tape attached to the device.
5- The device will show a (specific) sound, then the device will start counting down from (60 seconds) to (one second) to show the measurement result on the device screen.
Registration: The reading shown by the device after the measurement for each tested runner is recorded in the registration form.

4- VO2max test(30:4).
Test objective: Measurement of maximum oxygen consumption (VO2max).
Tools used: Fitmate pro device.
Procedures and performance: before starting the test, the test performer cleans the vo2max respirator with disinfectant solution, connects the parts of the Fitmate pro system together, installs the pulse belt on the tester's chest, and installs the Bluetooth pulse signal receiver in the Fitmate pro,

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After inserting The information of the tester in the device, which includes the name, date of birth, gender, height, weight, choosing the type of test to be performed (vo2mx), and then fixing the breathing mask tightly by means of its belts and making sure that no breathing air escapes from the mask, then the tester climbs on the treadmill device (Treadmills) and jogging gradually with increasing speed, where the test-taker begins to control the increase in jogging speed on the device with the speed gradient from the button for that in the treadmills starting from (4.5) to (13-14) km / h, and the device (Fitmate Pro) contains on a small screen with a square graph showing the pulse and maximum oxygen consumption (vo2max) with their respective ratios, which are monitored.

The conditions:

1- The tester must be in the normal state before the test begins.

2- Attention should be paid to increasing the load gradient on the treadmills, and to monitor the tester whenloss of abilityto running or upon the tester's request of the inability to continue.

3- Stopping the treadmills is by controlling the speed gradually.

The device readings are accepted when the tester reaches (84%) or more of the maximum pulse.

Registration:The device gives a comprehensive reading tape for measurements of maximum oxygen consumption (vo2max),

unit of measure: mL/kg/min

Training method (special speed endurance exercises)

The researchers prepared an integrated, programmed and standardized training program relying on physiological tests mainly to develop speed bearing capacity depending on some scientific sources and personal interviews with experts and specialists in the field of sports training science and strength games. These programs included different percentages of special speed training for a period of (8) weeks, as (Wilmore and Costel - 1994) (32:6) indicated that “most of the changes resulting from training usually occur during the first period of the program within (6-8) weeks, the intensity of the exercises was determined withstand The speed of the (Carvonen) method, by calculating the maximum heart rate reserve (maximum heart rate during exercise - maximum resting heart rate) and as in the following equation: target heart rate = reserve maximum heart rate x percentage of target heart rate + maximum rate For the pulse during rest, as for the rest, it was set according to the pulse rate, according to what was confirmed by several sources, that the rest period by the method of interval or repetitive training is to restore the athlete’s condition to a normal or semi-normal position determined by a certain pulse for To be more accurate and objective, so the rest period was adopted to return the pulse to (80%) of the pulse after warming up, the principle of load distribution (1-3) was used for each menstrual cycle, as the load is escalated for weeks (1-2-3) and reduced in Week (4) to the purpose of recovery, the training load was legalized in the two training programs and implemented in the special preparation stage.

Program execution:

The implementation of the training program for the research group was started after the completion of pretests, and this program took (8) weeks with (3) training units per week.

Statistical means:

The statistical data was processed using the ready-made software system (SPSS.

Chapter four:

Result:

Table 1

#No	Tests	measuring unit	Group	Mean	S.D	difference of	difference of	F	t	Sig

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						means	deviations			
1	Running 1500 meters	M/S	C	3.490	0.015	0.030	0.010	0.000	3.000	0.017
			E	3.460	0.015					
2	Running 1800 meters	M/S	C	4.248	0.019	0.022	0.012	0.153	1.739	0.120
			E	4.226	0.020					
3	Concentration lactic acid in the blood	Ml M/L	C	13.60	1.140	1.600	0.600	1.823	2.667	0.029
			E	12.00	0.707					
4	VO2max test	Ml/Kg/ M	C	55.40	1.140	4.800	1.000	1.089	4.800	0.001
			E	60.20	1.924					

* Under indication level 0.05 & 8 free degree.

Discussion:

It is clear from the table (1) shown above that the training program targeting the experimental group had a greater positive effect than the traditional program followed by the control group and this is evident from the difference of arithmetic means and standard deviations of the tests selected and in favor of the experimental group, as well as the significance of the t-test shows that the training program The new one was more useful, since all of its values were closer to zero. Thus, it is clear that the traditional program followed has a positive effect, but it is slight compared to the new program followed. The researchers attributes this result to the proposed exercises that were applied to the experimental group of runners, which led to the occurrence of adaptations that had an effective effect in the development and development of speed endurance, and this is certainly due to the specificity of the proposed approach to developing special endurance, which is an important principle of sports training which It should be taken into account, especially among (1500m) running coaches, as Mufti Ibrahim Hammad believes that “one of the conditions for training endurance is special speed as one of the physical capabilities of anaerobic endurance, which requires the use of exercises characterized by high intensity using the method of high intensity interval training for specific periods of time interspersed with rest Positive (incomplete) between repetitions, provided that these exercises are characterized by a gradual increase in speed at a time when the distance is also gradually reduced, which will improve the ability to extend the speed "(123:7).The researchers attributes the development achieved in the dimensional tests and for the benefit of the experimental group in the test of running (1800 meters) more than the race distance to the effectiveness of special endurance exercises that contributed to the development of this test time, as the distance of this test is greater than the completion distance (1500 meters)

The test distance (1800 meters) requires aerobic and anaerobic energy sources, so the special endurance exercises used by the researchers tended to develop anaerobic capabilities and as a result of the specific repetitions and intensity of each distance, which led to the body bearing physical burdens as a result of its fatigue in order to create special adaptations for the functional organs that were reflected On the development of the level of performance of this group in the performance of the maximum possible degree of intensity of jogging and for the longest possible period of time, as (Ibrahim Al-Basri) confirms that “experiments have proven that the endurance of the body and its stress in exercise, especially special endurance exercises lead to the imprint of the body on effort gradually and thus affect the ability of the device Heart and Spin (35:8),As for the physiological indicators (concentration of lactic acid, and maximum oxygen consumption Vo2max), it was found that there was a development in both of them in the tests, and the experimental group outperformed the control group.The researchers attributes this result to the proposed exercises that were applied to the experimental group, which were codified repetitions,

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training stresses, and rest periods based on the runners' physical and physiological capabilities, which were codified through the coach's acquaintance with the responses firstly through the time of cutting distances during training, "that the person who He has the ability to adapt metabolic and is characterized by the ability to work for long periods with low rates of consumption of energy production sources in the body, that is, the availability of what is known as an economy in the consumption of energy stores (9: 170),Imad El-Din Abbas states, "The load given to the player causes excitement to the vital organs and systems of the body from a functional and chemical point of view and change in them, and this appears in the form of an improvement in the adequacy of the various organs and systems; His adaptation to this load begins (10: 126) and Bastawisi Ahmed mentions that "the efficiency of muscular work is related to the presence of a large percentage of oxygen in the muscles or its transfer from the lungs to the muscles of movement through aerobic and anaerobic interactions (11: 86).

Chapter five:

Conclusions:

1- There is an effect in the training program followed by the experimental group in improving and developing the achievement at a high rate

2- There were significant differences between the two research groups in the post-test for the variables

(The concentration of lactic acid in the blood, the maximum oxygen consumption and the achievement of running (1500) for the benefit of the experimental group.

3- Special speed endurance exercises prepared by the researchers and used by the experimental group produced better results than the exercises used by the control group.

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