

The Effect of Lactic Endurance Training on Developing Speed Endurance, Lactic Acid Concentration, and Pulse after Effort and Achievement for 1500m Junior Runners

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Abstract

Athletics contains a group of competitions that are no less important than the other, and the 1500 meters competition is considered a fun and exciting competition for spectators and players in terms of competition, one of the characteristics is the codification of the tactical endurance exercises for training volumes during the training stages while maintaining the high level of intensity, and through the researcher's field experience as a coach and a former player, he noticed one of the reasons for the lack of development in the 1500-meter competition is the lack of use of standardized exercises that regulate the training loads that it requires great adaptations in the player's body's physiological parameters, this is what prompted the researcher to search for a legalization of lactic endurance training, which helps to develop speed endurance that leads to higher achievement level, and the goal of the research is to prepare lactic endurance exercises in developing speed endurance, lactic acid concentration and pulse after effort and achievement for 1500 meter runners emerging, the researcher used the experimental method by pre and post testing for the experimental and control groups, and the research community was identified for the players of the 1500 meter competition in the Mahawil Club in the Babylon Sports Stadium for the 2020-2021 training season, whose number is (14) runners, and the control group and by (7) runners for each group, lactic endurance exercises were applied to the experimental group for a period of eight weeks with three training units per week, and the (SPSS) statistical bag was used to process the data and obtain the results, from which the researcher reached the most important conclusions that the lactic endurance exercises had a positive effect on the development of endurance of speed, lactic acid concentration, and pulse after effort and achievement for junior 1500m runners.

Keywords: Lactic endurance exercises, speed endurance, achievement of the 1500-meter competition.

Introduction:

The most important characteristic of our modern era, especially during recent years, is the great development in the various sciences, Physical education sciences have received a share of this development in terms of quantity and quality, and training science is one of these sciences, athletics contains a group of competitions that are no less important than the other, and the 1500 meters competition is considered one of the fun and exciting competitions for spectators and players in terms of competition, what is distinctive is the codification of the tactical endurance exercises for the training volumes during the training stages while maintaining the relatively high level of intensity, in addition to increasing the overall training load and the burden on the player's shoulders during training and since the sports training process depends on the continuous and repeated transition between the states of fatigue and rest for the athlete during the different training units and what each training unit needs in proportion to its work, the importance of the research was evident in the use of standardized exercises for lactic endurance

during the training dose during the iterations of speed training exercises and achievement of achievement in 1500-meter jogging, thus the research contributes seriously to the development of achievement and the development of the internal response to various training stimuli.

Research problem:

It is known that lactic endurance training is one of the best exercises for the 1500-meter competition that was codified according to physiological grounds on the part of the adaptation of lactic acid obtained from physical exertion and the determination of the duration of rest between repetitions depending on the heart rate, and through the researcher's field experience as a coach and a former player, he noticed one of the reasons for the lack of progress in the 1500 meter running competition is the lack of use of standardized exercises that regulate the training loads that require large adaptations in the physiological indicators in the player's body, and this is what prompted the researcher to search for a legalization of lactic endurance training that Helps develop the ability to endure speed that leads to higher achievement level.

Research objectives:

- Preparing lactic endurance exercises in developing speed endurance, lactic acid concentration and pulse after effort and achievement for emerging 1500 meter runners.
- Identify about lactic endurance exercises in developing speed endurance, lactic acid concentration and pulse after effort and achievement for emerging 1500m runners.

Research hypotheses:

- Lactic endurance training has a positive effect on developing speed endurance, lactic acid concentration and pulse after exertion and achievement for 1500 meters junior runners.

Research fields:

The human field: Junior 1500m runners for Al Mahaweel club for the 2021 season.

Time field: From 29/11/2020 to 3/2/2021 .

Spatial field : Babylon Sports Club Stadium / Babylon Governorate.

Research methodology and field procedures:

Research Methodology:

The researcher used the experimental approach in the pre and post-test of the experimental group and the control group, to suit the nature of the research.

Community and sample research:

The research community was identified with the players of the 1500 meters competition in the Mahawil Sports Club for the junior category of the 2020-2021 sports season, which numbered 14 runners, and the sample was divided into two groups, the experimental group and the control group, with (7) players for each group.

Measures of homogeneity and equivalence were performed for the sample and the results were:

Table (1) shows the homogeneity of the sample.

Variables	Measuring unit	Mean	Median	Std. Deviation	Skew ness
Length	cm	176.10	173	3.231	0.361
weight	Kg	66.61	64.51	7.341	0.711
Age	Year	16.42	16	2.445	0.381

Table (2): shows the arithmetic mean, standard deviations, the calculated (t) value and the significance of the differences in the examined tests between the experimental and control groups in the pre-test.

N	Variables and tests	Groups	Mean	Std. Deviation	T value	Sig level	Sig type
1	Speed endurance	Experimental	2.52	1.231	1.564	0.431	Non sig
		Control	2.58	2.326			
2	Pulse	Experimental	118.01	1.352	1345	0.321	Non sig
		Control	120.02	1.561			
3	Lactic measure	Experimental	13.01	1.842	1.765	0.452	Non sig
		Control	14.33	1.364			
4	achievement for 1500m	Experimental	4.00	2.741	1.386	0.631	Non sig
		Control	4.04	2.651			

* Significant at the significance level (0.05) if the error level is less than (0.05).

The following methods and tools were used in the research:

Observation. , tests and measurements , a device for measuring height and weight , a legal athletic field , stopwatches (swan) of Chinese manufacture, number, medical scale, number (1), tape measure number (1). A device for measuring lactic acid in the blood (Lactate PRO Test METER), count (3), and (5) stress measuring system.

Tests used:

- 1000-meter speed endurance test.⁽¹⁾
- Measuring the pulse rate .⁽²⁾
- Measurement of lactic.⁽³⁾
- Achievement of 1500-meter runs .⁽⁴⁾

Pre-test:

The researcher conducted the pre-tests at the Babylon Sports Club stadium on Sunday 29/11/2020.

Exercises used in the research:

Implementation of the training program began on 3/12/2020 until 31/1/2021.

- The duration of the exercises set in weeks: (8) weeks.
- The total number of training units: (24) training units.
- Number of weekly training units: (3) units.
- Weekly training days: (Sunday - Tuesday - Thursday).
- The training method used: The method of high intensity interval training.

Post-test:

After completing the training program, the research tests were conducted on Wednesday 3/2/2021, and the researcher took care to provide conditions similar to the pre-tests in terms of (time, place, tools used, and the method of conducting the tests). At the Babylon Sports Club stadium.

Table 3: Exercises used in the research

Days	The exercise	Intensity	Rest in between		Total volume
			Repetition	Groups	

Sunday	300m× 6+500m×6	85%	1 minute	3minute	4800m
Tuesday	600m× 4+800m×3	85%	2minute	4minute	4400m
Thursday	1600m× 3+1200m×3	85%	2minute	5minute	8400m

The following statistical means in the research: The researchers used the Statistical Package (SPSS) to find the appropriate statistical treatments.

Research results:

The results of the experimental and control groups in the studied variables were presented, analyzed and discussed, as well as the results of the differences between the pre and post-tests of the experimental group in the studied variables were presented and analyzed.

Table (4) shows the difference of the arithmetic mean, its standard deviation, the value (t), and the significance of the differences between the results of the pre and post-tests of the two research groups in the variables in question.

Variables	Measuring unit	Groups	Pre-test		Post-test		T value	Sig level	Sig type
			Mean	Std. Deviation	Mean	Std. Deviation			
Speed endurance	Cycle /sec	Experimental	2.52	1.234	2.50	2.463	2.473	0.022	Sig
		Control	2.58	2.542	2.56	4.675	3.756	0.000	Sig
Pulse	Stroke/ minute	Experimental	118.01	1.378	116.00	2.564	5.231	0.002	Sig
		Control	120.02	3.765	118.00	3.582	3.562	0.003	Sig
Lactic measure	Mol / liter	Experimental	14.33	4.542	13.05	4.631	2.673	0.004	Sig
		Control	15.21	4.932	14.11	3.752	2.482	0.001	Sig
achievement for 1500m	Cycle/ sec	Experimental	4.00	3.675	3.59	4.543	2.631	0.002	Sig
		Control	4.04	3.564	4.02	4.752	4.751	0.000	Sig

Significant at the significance level (0.05)

Table (5) shows the difference of the means, the value of (t), the level of error and the significance of the differences between the results of the post-test of the two groups of research in the variables under investigation.

Variables	Measuring unit	Pre-test		Post-test		T value	Sig level	Sig type
		Mean	Std. Deviation	Mean	Std. Deviation			
Speed endurance	Cycle /sec	2.47	2.432	2.53	3.321	4.765	0.000	Sig
Pulse	Stroke/ minute	115.00	1.546	116.00	2.351	3.541	0.001	Sig
Lactic measure	Mol / liter	12.00	1.324	13.00	4.674	4.768	0.002	Sig

Achievement 1500m	Cycle/ sec	3.57	1.764	4.00	3.691	4.456	0.001	Sig
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Significant at the significance level (0.05).

Discussing the results:

It appears from the results of tables (4 and 5) that there are significant differences in the research variables between the pre and post-tests of the two research groups and in favor of the post test, and the researcher attributes that the tactical endurance exercises have great importance in developing the ability to endure speed, as there appeared to be an evolution in the post-tribal tests, as it was scientifically selected and organized, which were standardized in intensity, volume, and distances, which mainly depended on the pulse rate assigned to each group, which was chosen to comply with the requirements of carrying speed and which had an effective effect in reaching these results Positive in all post-tests, and this is what (Hamdi) emphasized about “the importance of rationing the training load used so that it is commensurate with the level of athletes first and the aim of training secondly (Hamdi Abdel Moneim and Muhammad Abdel-Mughni: 2000, ⁽⁵⁾ . The use of the heart rate in training is one of the most important indicators that can be used in regulating the period of rest between exercises, and this is what was activated in this study, which relied on the pulse rate to standardize the rest time, as it is one of the very important indicators for the trainer and athlete because it is easy in the field to measure beats The heart that gives an indication of the athlete's training status and the effort exerted (Abu Al-Ela Abdel Fattah and Muhammad Subhi Hassanein: 1999)⁽⁶⁾ . Also, the lactic acid percentage remains accumulated in the muscles, meaning that fatigue still exists in the muscle, that returning to complete recovery does not give a sufficient and effective opportunity on the athlete's functional body in order for it to be adapted to perform its functions despite the occurrence of fatigue, especially the biochemical adaptations that they occur in muscles, blood, and the functional changes that occur in the heart and the circulatory and respiratory systems (Israa Fouad Saleh: 2004) ⁽⁷⁾ . In addition, the training program that used the method of high-intensity interval training and the standardization of the rest time on the pulse rate, led to the development of the ability of speed endurance and also contributed to the development of the achievement level of 1500 meters. The method of high-intensity interval training contributes to improving the efficiency of energy production of the anaerobic system under conditions of lack of oxygen Mufti Ibrahim Hammad: 2002) ⁽⁸⁾ .

Conclusions and recommendations:

Conclusions:

- The results showed the development of speed tolerance, lactic acid measurement, pulse rate and achievement for 1500 meters runners between pre and post measurement, through lactic endurance exercises for the experimental group and for the benefit of post measurement.

Recommendations:

- Interest in developing tactical endurance, which is of importance in developing achievement in athletics competitions over medium distances (800 meters, 1500 meters and long distances (50003000 meters, meters, 10,000 meters).

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