Evaluating a training program in terms of the lactic differential threshold and some respiratory indicators for hurdle youth runners in 3000 meters race

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Abstract

The world witnessed at the present time progress scientifically significant in the application of modern scientific bases in the sports field, which has become a key pillar counts on raising the level of performance and the get advanced results in many games and sports events, including the activities of athletics, which date significant progress in the i leaflet performance Ha and the level is higher functionally and physically. The importance of research lies in the interest in athletics activities, including running 3000 m hindrances. Therefore, scientific methods must be adopted in training and the need to use appropriate means to explore the functional capabilities inherent in the athlete's body represented by the functional capabilities of the circulatory and respiratory systems during sports training, as well as providing the requirements for muscular work. Crystallized research problem in identifying the capabilities of a group of runners to the effectiveness of (3000 m steeplechase) and functional physical and study them on according to the type of training or training program , and through that we can evaluate this program or training curriculum in terms of the threshold distinguishing index values indicators functional Other Under study for players, including maximum oxygen consumption, respiratory frequency, heart rate, pulmonary ventilation, as well as level of physical abilities through physical activity tests. The aim of the study to identify the threshold distinguishing index values and some device indicators of respiratory research sample under study , the imposition of the researcher Wen presence differences y and the data statistically significant differences between the test yen pre and post the results of indicators functional and for post - test for the research sample under study. The researchers used the experimental approach on 6 of those who ran the effectiveness of 3000 m. Contraindications, and after analyzing and treating the values of the studied functional indicators of the research sample, the researchers reached several conclusions, including the differential threshold indicator, the effective role of improving the functional status of runners, and the recommendations were to conduct monthly periodic tests of the players 'functional indicators to know the effectiveness of the training program used for runners. .

Key words: pulmonary ventilation, differential threshold, 3000m. Contraindications

Introduction:

Evolved at the present time science devices of exercise and become most indicators measure the functional way of direct and accurate results of error - free almost in the case have the right to use, and these devices or supplies is a fitness device as through it, we obtain the results of the values of the functional indicators that include the respiratory system and others , especially the lactic threshold index . Pulmonary ventilation and behold when voltage physicist and this whole , we can evaluate the training programs used in training. The

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importance of the research lies in the interest in athletics events, especially the 3000- meter steeplechase run. Therefore, scientific methods must be adopted in training and the need to use appropriate means to explore the functional capabilities inherent in the athlete's body represented by the functional capabilities of the circulatory and respiratory systems during sports training, as well as providing the requirements for muscular work .

Research problem: Lies the research problem in identifying the capabilities of a group of runners to the effectiveness of (3000 m steeplechase) and functional physical and study them on according to the type of training or training program , and through that we can evaluate this program or training curriculum to denote the threshold distinguishing index and the values of functional indicators other under study players , including the maximum consumption of oxygen and the frequency of breathing and heart rate, ventilation and pulmonary as well as the level of physical abilities through physical tests for effectiveness , which is for the coach and the researchers found only for the purpose of evaluating the level and so for the development of hostility functionally and the preparation of its best image through the calendar The training program used by the trainer to reduce the extra effort of the heart without limiting his ability to perform . He aspires researcher Wen to find effective programs in training to raise the level of physical performance and to improve the level of fitness and functional sample search for knowledge of the individual differences of the functional status of each runner also through the use of the device, And the trainer is acquainted with the various information (functional indicators) while performing the tests that were used in the research. The study aimed to identify the values of the differential threshold index and some respiratory system indicators for the sample under study. Upright training program used in terms of the threshold distinguishing and some indicators functional respiratory research sample. Since the imposition of the researcher Wen existence of differences y and the data statistically significant differences between the test data tribal of the interfaces and posttest of the results of indicators functional and in favor of the test data posttest of for the research sample .

And be the human sphere on the runners who represent players elected Diyala University to run 3000 m steeplechase and who are being groomed to participate in Iraqi universities championship's six runners was the time period of the study from 11/11/2018. Up to 13/2/2019 in the College of Education, Physical and Sports Science - University of Diyala   (Physiology Laboratory - Foreign athletics arena)

Methodology

Research Methodology: The researcher used the one experimental method with a test of tribal and intra and post per set mil fit nature of the research problem.

Research sample: The selection of the sample is the main thing for the researcher's work, as it is considered one of the basic matters in scientific research. On this basis, the sample was selected from the players side of Diyala University in the athletics team ran the 3000 - meter steeplechase, and the number of the sample total (9) runners were selected the way purposively. The researcher selected (6) runners from among them for the purpose of study and tests. One of the total samples was excluded after a week due to lack of commitment to training, and two of them had had an exploratory experience.

Table (1) shows Median values for both chronological and training age, height, weight, and BMI values, for each group

Variables	Age Temporal	Age of training	Length	the weight	Indicator body mass (BMI)
the sample	21 years	4 years	176 cm	63 kg	21.5

Tools and equipment research and means of gathering information: - Portable calculatorp4 Type HP. -the device Electronic Italian made. Italian height and weight measuring device - Treadmill device (Treadmill) - Electronic stopwatch - Camera phone to record the tests. - Arab and foreign sources and references. - The global network of information (the Internet).

Defining the studied variables in the research :The researcher, based on his experience in the specialty, has identified the most important functional indicators under study that are related to the evaluation of the players' functional status, which are related to the circulatory - respiratory system, and in agreement with the trainer concerned with training the university team for the effectiveness of running 3000 meters of obstacles and through which the training program used is evaluated on The research sample and that these indicators are (Differential (lactic) threshold(LA) And pulmonary ventilation(VE) And the frequency of breathing (RF)And heart rate (HR) During the effort.

The exploratory experience: Researcher Wen conducted the reconnaissance experiment at exactly one thirty on Wednesday (20/11/2018) the importance of this experiment in order to obtain accurate results, and it was conducted by two players from outside the research sample under study and from the research community itself, and they were tested on the use of a fitness device. The Treadmill device is to closely monitor the obstacles or problems that may arise in the stages of the test procedure, as well as to ensure their safety when applying the tests.

Lactic differential threshold test: The aim of the test: Measurement of the lactic difference time index (AT time) some respiratory indicators are under study during exertion. *Tools used*: device (fitmate pro)* ", Treadmill (Treadmill). *Performance method*: The measurement process is carried out by attaching the belt of the pulse to the runner's chest, after which the runner ascends the treadmill and wears the mask for the stress test. (Fitmate pro) A minute after the player started jogging for the purpose of correcting errors and warming up , and therefore the time of the emergence of the tactical differential threshold was calculated by the gradual effort (increase in intensity) and by the direct method through the device(Fitmate pro)By analyzing the air by the mask for measuring this indicator and its accessories, Bruce standardized test was applied(Bruce Test) On each member of the sample, through continuous running to increase the stages of intensity by increasing the speed and height of the treadmill until the effort (fatigue) of the player is exhausted. *Registration*: The results of the functional indicators under study are shown through the printer, in the same device, on special paper, and for each runner separately.

Main Experience: Pre-test: After the preparations made by the researcher, including recording information about the research sample such as age, height and weight, and recording it in the said device. Tests were conducted tribal research sample in Physiology Laboratory at the College of Education , Physical and Sports Science / University of Diyala, to draw variables functional own through the device (Fitmate Pro(And by the Bruce Test) Bruce Test (And on device) Treadmill) . As it was pre - test at exactly nine o'clock am on Wednesday and Thursday, corresponding to (28 - 27 /11/2018) Each day, 3 runners from the research sample are tested in order to suit the times of the functional and physical tests for each runner, and after identifying the values of the indicators studied for the research sample by the researchers and the trainer, the training program was developed according to the functional ability of the research sample and its use in the training units at a rate of 3 units per week. *The test interface and posttest for indicators Search:* The inter- test of the research sample was conducted approximately 45 days after the date of the pre-test, and after training within the prepared program, the sample was subjected to regular training modules. As it has been interoperability testing at the same time mentioned at nine o'clock am also from on Monday and Tuesday (13 - 14/1 /2019) and the same procedures and steps that have been followed in the pre - test. After identifying the new values of the indicators of the research under study, the training program is evaluated here by the trainer and with the help of the researchers in the light of what is included in the inter-test, and errors are corrected if any or the training program is modified to serve the improvement of the functional and physical ability of the runners under study. And was a post - test (last) after a period of three months on 26-27 / 2/2019 were collected results or data extracted from the device used was discharged and arranged for the purpose of processing statistically.

Statistical methods: The researcher relied on the statistical bag SPSS Using statistical parametric in dealing with the results of s yum functional indicators studied under a search.

Results

1. **Display the arithmetic mean and standard deviations of the indicator values (AT time) in the three tests of the research sample**

Table (2)

Variables		N	Mean	Std. Deviation	Std. Error	Minimum	Maximum
AT Time Ml / kg / min	The pretest	6	5.267	0.535	0.219	4.4	6
	Test interface	6	5.572	0.465	0.190	5.22	6.5

	Telemetry	6	6.367	0.653	0.267	5.5	7.2
	Total	18	5.735	0.708	0.167	4.4	7.2

Table (3) it shows the value of the analysis of variance ANOVA For the threshold indication of the difference between and within the tests for the research sample

| Variables		Sum of squares	Degree of freedom	Average of squares	F	Sig.	Type
AT	Between measurements	3.870	2	1.935	6.247	0.011	moral
	Inside measurements	4.646	15th	0.310			
	Total	8.516	17				

Under error level = 0.05

Table (4) shows the preference of the differences (the least significant difference) LSD For the differential threshold index between tests

T	the exams		Difference of arithmetic mean	Sig	Indication type
1	Tribal	Penny	-0.305	0.358	Immoral
2	Tribal	after me	-1.1	0.004	Moral in favor of the post
3	Penny	after me	-0.795	0.026	Moral in favor of the post

A form chart (1)

Shows indicator change (AT) Difference threshold time during tests (pre, intra, post)
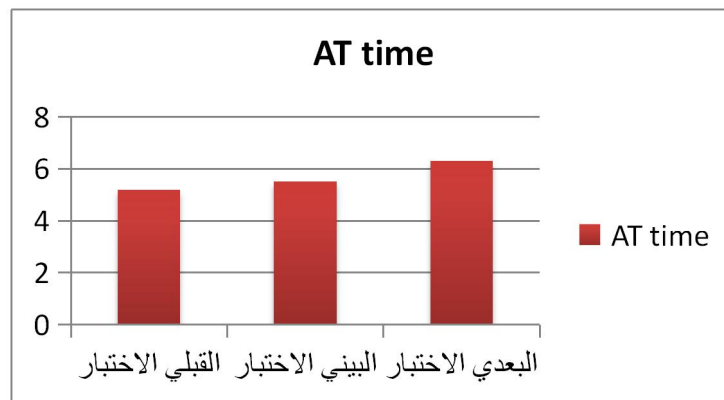
Discussion of the values of the threshold distinguishing (AT)

The results obtained from Table (2) referred to the descriptive statistics of the research indicators. It was found that there is a noticeable development of this indicator between the pre-, inter- and post- test through the arithmetic meanings, and it is a positive indicator indicating the improvement in the functional ability of the research sample as the time of the lactic threshold whenever it is delayed The appearance of the runner when performing the physical exertion was better, which means the delay in the accumulation of lactic acid in the working muscles and thus the delay in the appearance of muscle fatigue and in turn reflects the improvement of the functional and training state of the runner. Through the results of Table No. (3), there were statistically significant differences in the indicator of the differential threshold of the sample, especially between the pre and posttest, as well as between inter and post-test, and good law, the least significant difference LSD. Attribute researcher Wen that the effectiveness and impact of the training program used and modified by the researchers and the coach as well as sample units of daily training commitment during this period and to use good distribution periods of pregnancy and comfort and is therefore a positive response to

the devices body of hostility and shows that also the graph (1). Regarding this, Abd al-Fattah and Nasr al-Din Radwan (1993: 253) indicate that one of the most important factors that help delay the emergence of the lactic threshold is the spread of lactic acid through non-working muscle fibers and its reconstitution into energy by the liver, and this can only be achieved through high-intensity training. Its role is not limited to increasing the speed of the metabolism of lactic acid by the working muscles and thus the speed of eliminating it, but rather works to increase the efficiency of the non-working muscles in their consumption of lactic acid, as targeting the work of the non-working muscles can only be done through high-intensity exercises. Which works to increase its consumption capacity for lactic acid, and this in turn leads to a delay in the emergence of the anaerobic lactic threshold, and this is what happened in the inter-test of the research sample. Hand we see the lack of improvement in the index of a threshold distinguishing between pre - test and interconnection and as clarified by the previous graph and attribute researcher that Wen to the lack of response from one of the sample for training and not the other 's commitment to the unity of daily training , which impact directly on the average value of this indicator, so see researcher Wen need to adopt the trainer on the individual results of the values of indicators for each runner and puts so pregnancy levels or distress, comfort , and each runner.

Table (4) it shows the arithmetic mean and standard deviations in the test (pre, intermediate, and post) of the value of the pulmonary ventilation index of the research sample

Variables		N	Mean	Std. Deviation	Std. Error	Minimum	Maximum
VE L / min	The pretest	6	118.783	7.868	3.212	108.9	130.5
	Test interface	6	119.342	6.679	2.727	113.9	131
	Post test	6	126.933	7.346	2.999	118.3	136.2
	Total	18	121.500	7.926	1.868	108.9	136.2

Table (5) shows the value of the analysis of variance between tests for the pulmonary ventilation index (VE) for sample search

Variables		Sum of squares	Degree of freedom	Average of squares	F	Sig.	Indication type
VE	Between measurements	265.690	2	13 2.845	2.483	0.117	Immoral
	Inside measurements	802.370	15th	53.491			
	Total	1068.060	17				

Discussion of pulmonary ventilation index values (VE) for sample research

Through the results obtained by the researchers in Table 4, and by looking at the arithmetic means of this indicator, we see a marked improvement in the inter- and post-tests during the study period, despite the absence of the significant difference in Table 5, and this indicates the positive effect of the training program used, which was evaluated before. The researchers depending on the values extracted from the tests, as the pulmonary ventilation index, the higher its value, the better. As shown in graph 2 also.

Table (6) Clarifies the arithmetic mean and standard deviations in the test (pre, intermediate, and post) of the functional indicators values (HR, RF)For sample search

Variables		N	Mean	Std. Deviation	Std. Error	Minimum	Maximum
	The pretest	6	120.363	1.612	0.570	118.700	123.500
	Test interface	6	118.863	2.105	0.744	115.600	121.900
HR	Post test	6	119.475	2.130	0.753	115.100	122.300
	Total	18	119.567	1.979	0.404	115.100	123.500

|							
RF	The pretest	6	31.125	1.126	0.398	30,000	33,000
	Test interface	6	31.625	1.847	0.653	29,000	35,000
	Post test	6	30.125	1.246	0.441	28,000	32,000
	Total	18	30.958	1.517	0.310	28,000	35,000

Table (7) it shows the value of the analysis of variance between tests for functional indicators (HR, RF) for sample search

Variables		Sum of squares	Degree of freedom	Average of squares	F	Sig.	indication
HR	Between measurements	9.101		4.550			**Immoral**
	Inside measurements	80.973		3.856	1.180	0 .327	
	Total	90.073	6				
RF	Between measurements	9.333		4.667			**Immoral**
	Inside measurements	43.625	6	2.077	2.246	0. (131)	
	Total	52.958					

Discussion of the values of the index functional frequency breathing and heart rate after effort (HR, RF) for sample research:

When we observe Table 6 and Table 7, which concern the two indicators above, we see that there is some improvement in the inter- and post-tests. This is also a good indicator that reflects the health of the cardiovascular system in runners and their accustomed to exercising muscular work. We did not find significant differences between these tests. The researchers believe that the time period is insufficient. To study, there may be no major adaptations of the circulatory - respiratory system during this period and as shown in Diagram 2. Emphasizing on that, " regular and regulated exercises lead to a positive functional response to the vital organs in the body, especially the respiratory system (such as widening the rib cage and increasing the volume of the lungs' cavity) and this contributes to and increases the process of gas exchange and economizes breathing movement due to the increase in vital capacity and this ultimately leads to a decrease in Respiratory rate or breathing frequency of the player (Qasim, 1990) and all this achieves the second objective of the study.

Diagram (2) Demonstrates changes in functional indicators (pulmonary ventilation, heart rate, respiratory frequency) during (pre, intra, and post) tests.
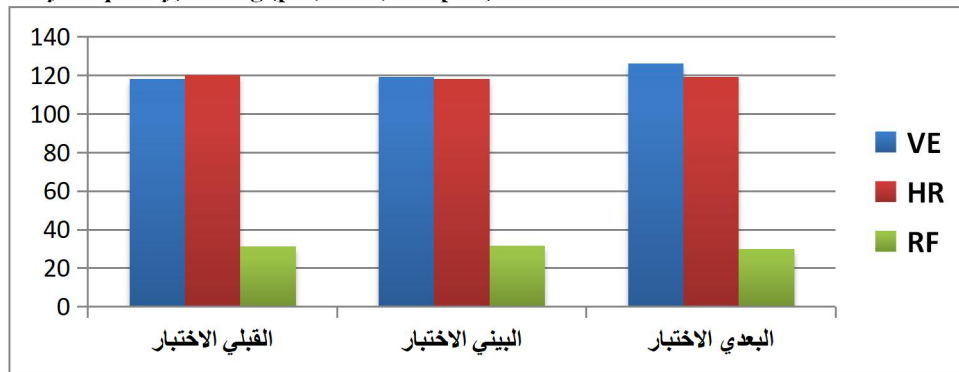
Conclusions
Of through the results obtained by the researcher Wen through the statistical treatment of the values reached back conclusions, namely: -

1- There is a noticeable improvement and improvement in most of the functional indicators studied between pre-, inter- and post-test.

2- There is a clear and statistically significant improvement in the differential threshold index, which indicates the effectiveness of the training program prepared by the trainer and researchers, and consequently the job status of the runners improves.

3- Adoption of the trainers to measure the lactic threshold values AT Players are allowed, on a regular basis, to prepare a correct and scientific training curriculum to improve their functional and physical ability.

4- Study of the topic of lactic threshold for other efficacy by researchers and scholars.

5- The necessity of using periodic job tests and measurements by coaches for the possibility of predicting the effectiveness of the curriculum or the training program used on the players.

6- The players' full and continuous commitment to the training units and not to stop them.

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