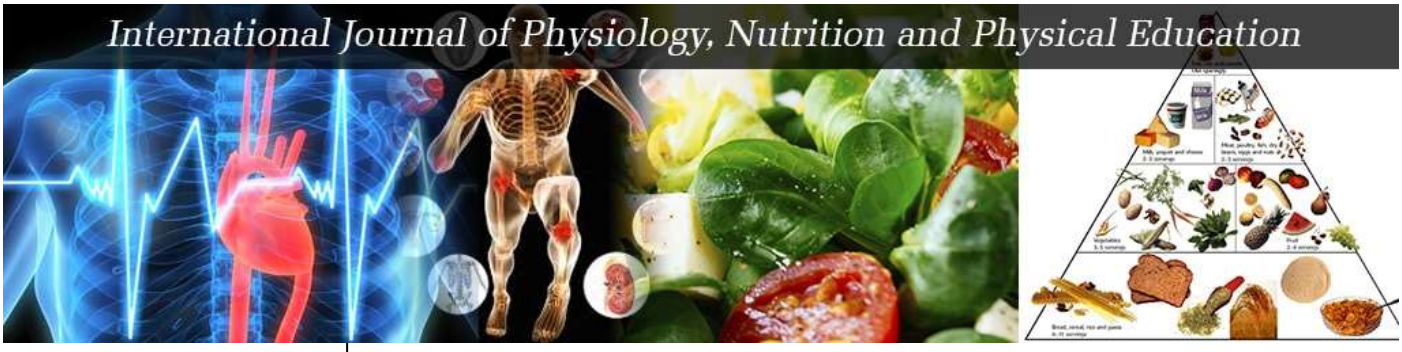

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The effect of effort perception training according to race speed rhythm control for developing speed endurance, adapting maximum heart rate, and achieving 3000 m running/hurdles for men

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Abstract
The researchers developed exercises for effort perception, rhythm and fast pace control, effort distribution, maintaining the rhythm of motor performance, and programming an evaluation of the change in training load based on a modified indicator after noticing a difference in time and the subsequent difference in the times of each session of the race. Maximum heart rate when running by maintaining a high level of performance throughout the activity and completing the race with a high level of fatigue resistance, Players from (6) clubs competing in the Clubs and Institutions Championship for the 2023 season were chosen as the research population, totaling (12) players. Six players were assigned to each of the two group control and experimental from the sample. The study authors found that training in effort perception has a positive effect. The pace of the race was changed to boost maximum heart rate, speed endurance, and success in the 3000 meter/men's hurdles.

Keywords: Effort perception training, speed endurance, maximum heart rate, completion of 3000 m/hurdles

Introduction
Since the effort perception exercises are what determine the training stress index and subsequently evaluate the players' responses, the most significant aspect of our current era is the scientific development of the physical aspect and the physiological index. Additionally, because the race competition distance is so long (3000 m/horses), performing it quickly requires a lot of effort to avoid becoming fatigued. Without feeling too exhausted, which aims to develop unique physical abilities, such as the quickness with which one can carry out physical effort, which is characterized by rapid performance, as well as managing the regular repetition of steps according to their lengths and frequencies, in a way that guarantees maintaining a high level of running speed and endurance, which helps to delay the increase in the maximum heart rate, which means maintaining the average pace attained for the longest amount of time, and from here it becomes clear how important it is to do research on the state of training to comprehend the players' efforts to keep a steady rhythm and produce high-level outcomes.

Research Problem
The researchers were inspired to create exercises for perceiving effort, controlling the rhythm and fast pace, and how to distribute effort and maintain the rhythm of motor performance at the same pace during the time spent by their observations of differences in the times occurring during this competition and the ensuing differences in the times of each session of the race. When training, organizing monotonic speed endurance values during programming, assessing changes in the training load based on the maximum heart rate index while running, maintaining high performance without deteriorating throughout the activity period, and finishing the race with a high degree of fatigue resistance are all important.

Research objective

1. To adjust maximal heart rate for the 3000 m/men's hurdles run, determine the impacts of effort perception workouts based on changing the race speed rhythm.
2. Comparing the experimental and control groups' post-test results for raising the maximum heart rate, boosting speed endurance, and completing a 3000-meter men's hurdles run.

Research hypotheses

In order to increase speed endurance, adjust the maximum heart rate, and complete the 3000 m/hurdles run for men, effort perception training centered on managing the pace of the race is beneficial.

Research fields

Human field: Men's 3000 m/hurdles athletes for the 2023 season.

Time field: From 11/6/2023 to 17/8/2023.

Spatial field: College of Physical Education and Sports Sciences Stadium/University of Baghdad.

Research methodology and field procedures

Research methodology

The researchers used the experimental method.

The research community and its sample

The community names the twelve (12) players from Iraqi clubs (Army Sports Club, Police Sports Club, Al-Hashd Sports Club, Al-Mina Sports Club, Air Defense Sports Club) for the 2023 season.

Table 1: Sample homogeneity

Variables	Measuring unit	Mean	Median	Std. Deviation	Skewness
Mass	Kg	68.512	68.00	1.163	1.47
Length	Cm	172.221	170.00	0.124	0.34
Age	Year	26.133	26.000	0.641	0.42

Methods of data collection

- Observation and experimentation.
- Arab and international sources.
- Internet-based International Information Network.
- Athletics field.
- 80 signs.
- 1 video camera (Sony) with frequency (260 images).
- Laptop (Dell).
- Electronic medical scale (1).

Tests

Running test (2000 m) (A. Dirix, H. g. Kuntigen, 2016) [1]

Maximum heart rate (Bassem Hamza Muhammad: 2004) [2]

Completion test running 3000 meters/ hurdles (Novich, M. M. and Toylor. 2012) [3]

Pretests

On Sunday, 11/6/2023, at the stadium of the College of Physical Education and Sports Sciences.

Table 2: Equivalence of the research sample

Variables	Pre-test		Post-test		t	sig	sig type
	Mean	Std. Deviation	Mean	Std. Deviation			
running 2000m	6.06.651	0.1182	6.09.121	1.0116	1.646	0.078	Non sig
Maximum heart rate after exertion	182.123	0.4201	186.239	0.0271	1.048	0.316	Non sig
Achievement: Running 3000m / hurdles	9.04.265	0.3817	9.06.231	0.0612	0.867	0.324	Non sig

Main experiment

The implementation of the training units began on Thursday, 15/6/2023, until Monday, 14/8/2023.

Table 2: Implementation of the training units

Days	Training vocabulary	Intensity	Exercise time	Repetition	Groups	Rest		total time
						Repetition	Groups	
Sunday	Run 1000m standing	85%	3.30 min	4	2	120 BPM	180 BPM	47 min
Tuesday	Run 2000m standing	85%	8 min	3	2	180 BPM	240 BPM	54 min
Thursday	Run 3000m standing	85%	11 min	4	1	240 BPM	-----	60 min

Post-tests

On Thursday, August 17, 2023, at the University of Baghdad.

Statistical methods: The researcher used statistical methods through the SPSS package.

Results presentation, analysis, and debate

Table 3: Results of the pre- and post-tests for the study variables, including completing the 3000-meter run/hurdles and heart rate adaptation, are shown

Variable	Pre-test		Post-test		Means Difference	Std. Deviation Difference	t	Sig	Sig type
	Mean	Std. Deviation	Mean	Std. Deviation					
running 2000 m	6.06.65	0.117	6.04.14	0.066	0.025	0.1773	6.110	0.002	Sig
Maximum heart rate after exertion	182.12	0.5200	180.165	0.176	1.958	0.5020	3.261	0.001	Sig
Achievement: Running 3000m / hurdles	9.04.26	0.4917	9.01.34	0.053	0.029	0.497	5.965	0.000	Sig

Table 3: Displaying the results of the pre and post-tests speed endurance heart rate, and completion of running 3000 meters/hurdles

Variable	Pre-test		Post-test		Means Difference	Std. Deviation Difference	T calculated	Sig level	Sig type
	Mean	Std. Deviation	Mean	Std. Deviation					
running 2000 m	6.09.12	0.031	6.06.14	0.039	0.029	0.044	4.626	0.001	Sig
Maximum heart rate after exertion	186.23	0.027	184.04	0.229	2.196	0.027	3.452	0.000	Sig
Achievement: Running 3000 m / hurdles	9.06.23	0.0716	9.04.01	0.116	0.022	0.073	6.132	0.002	Sig

Table 4: Results of the tests to measure speed endurance, adaptation of maximum heart rate, and completion of running 3000 meters/hurdles for the experimental and control groups are presented, analyzed, and discussed

Variables	Experimental		Control		t calculated	Sig level	Sig type
	Mean	Std. Deviation	Mean	Std. Deviation			
Endurance running 2000 m	6.00.16	0.066	6.03.10	0.046	3.365	0.000	Sig
Maximum heart rate after exertion	176.16	0.073	180.23	0.229	4.761	0.002	Sig
Achievement: Running 3000 m/hurdles	8.57.21	0.054	9.01.9	0.127	6.056	0.000	Sig

Discussion of the results

The researchers used the proper scientific method of codifying the training load to control the pace and perception of the race speed, which helped to prepare the runners in the competitve environment during the level of tactical performance and maintaining the speed. There are substantial changes between the pre- and post-tests, favoring the post-test, as shown by the table of the pre and post findings for the variable (Naeem, A., & Al-Fadhli. S. 2020) [4], speed endurance training increases the capacity of muscle regulators (Abualther, J, & Jasim, M. 2023) [5]. Heart rate is one of the very important physiological indicators for the player and for the coach, and thus the possibility of codifying and distributing the training load on a scientific basis between intensity, volume and rest. The exercises Correct during high effort that is proportional to the pulse rate and mastering the rhythm of the race distance (Hashim, M, & Naji, D. 2023) [6], therefore, choosing the intensity, volume, and complete rest for recovery is compatible with the speed endurance requirements (Abdulsattar. m., & Ali, N. 2017) [7], and using the gradual principle of these exercises and using rest periods and repetitions to restore recovery is what contributed to the development of achievement (Abdul Latif, M & Fadhel, A.K. 2020) [4], and through the implementation of the prepared exercises, the movement path of the runners developed over the obstacles and the water barrier, which led to the development of the crossing time and the completion time (Muhammed, Z, & Rashid, I. 2019) [8].

Conclusion and recommendations

Conclusion

1. The pre- and post-test of effort perception exercises in accordance with modifying the race pace rhythm to develop speed endurance and adjust the maximum heart rate for the experimental group and in favor of the post-test results clearly revealed a considerable benefit.
2. The activities employed by the experimental group to develop their ability to run the 3000 meters and hurdles were preferred to those utilized by the control group for improving effort perception in accordance with the race pace rhythm.

Recommendations

1. Emphasizing and relying on effort perception exercises more for the stages of performance, which is more important for its great role in clarifying the changes and physiological responses that occur within the players' bodies as a result of physical effort.
2. Carry out comparable investigations and research with both genders and diverse age groups.

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