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## The effect of exercises in both high and repetitive interval training methods to develop speed endurance, strength endurance, and the achievement of 400 meters' hurdles under (18) years old

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### Abstract

The aim of the research is to prepare exercises in both high and repetitive interval training methods to develop some physical capabilities and complete the 400 meters' hurdles under (18) years old, where the research problem is determined that the achievement of the players of this event does not rise to acceptable levels, as a result of weakness in physical capabilities and achievement, so it has become impossible to develop only through organized training. The two researchers used the experimental approach with the pre and post-test for the experimental and control groups to suit the nature of the research. The research community was determined by the governorate Baghdad players Those who are training in the Al-Bayaa Youth Forum, the Specialized School for Talent Care, the arena and field stadium, College of Physical Education and Sports Sciences / University of Baghdad for the 2022 sports season, whose number is (10 players), as the research sample was selected in a comprehensive enumeration method, and the sample was divided into two experimental groups and the control group, with (5 players) for each group. One week, the two researchers used the statistical bag (SPSS), and the two researchers reached the most important conclusions that training in two ways High and repetitive interval training had a positive effect on developing some physical abilities and completing the 400-meter hurdles under (18) years old

### Keywords

high and repetitive interval training, speed endurance, strength endurance, achievement of 400 meters' hurdles

### Introduction:

Athletics is one of those games in which the events vary from throwing, running, and jumping, and each has special functional requirements, as well as the educational and training aspects, which have a direct impact on the physical side according to the specificity of its performance, distance, time, and energy systems, and each of them has something that distinguishes it from the other differently. Training methods on the one hand (6), and the physical capabilities that must be developed on the other hand, and among the activities of fast running are the effectiveness of 400 meters' hurdles, and each running distance has its own training requirements in terms of the physical aspect and the method of training that suits it and

the nature of its performance and its time. From the physical point of view (12), there are important abilities used in training them to match the intensity of their performance with the performance of running the required distance, and it is one of the most important indicators used to monitor the intensity of performance, and ration the rest period between exercises according to the training goal and the amount and direction of its load in a way that suits the nature of the age group, and here the importance of the research is evident (2) The effect of training in both high and repetitive interval training methods to develop speed endurance, strength endurance, and the achievement of 400 meters hurdles under (18) years old, and thus the

research gains its importance by providing successful solutions in an economical manner in terms of time and effort and knowing its positive impact in bringing about the required development and improving the level of the players better, the research problem lies: Despite the development and progress in the field of sports training science in the world, most sports in the country still suffer from some obstacles that hinder their progress, especially The arena and field event, especially the 400-meter hurdles event, where the research problem is determined by the fact that the achievement of the players of this event does not rise to acceptable levels, as a result of weakness in endurance speed, strength endurance and achievement, so it has become possible to develop only through organized training, that is, practice of the event according to A coordinated training approach, so the two researchers decided to develop a training program according to training in both high-interval and repetitive training methods, and obtain high results that contribute to the development of the digital level of this effectiveness.

Among the objectives of the research: Preparing exercises in both high and repetitive interval training methods to develop speed endurance, strength endurance, and the achievement of 400 meters' hurdles for under (18) years old.

Learn about exercises in both high and repetitive interval training methods to develop speed endurance, strength endurance, and the achievement of 400 meters' hurdles under (18) years old

As for the hypotheses of the research: The exercises in the high and repetitive interval

training methods have a positive effect on the development of speed endurance, strength endurance, and the achievement of 400 meters' hurdles under (18) years old.

As for the fields of research: the human field: players running 400 meters' hurdles under (18) years in Baghdad Governorate for the 2022 sports season.

Time range: the period from 8/1/2022 to 19/3/2022.

Spatial field: the arena and field stadium, College of Physical Education and Sports Sciences\University of Baghdad in Baghdad Governorate

### **Method and tools:**

The two researchers used the experimental approach with experimental design with pre and post-test for two equal groups (experimental and control) due to its suitability to the nature of the research.

The research community and its sample: The research community was determined by the Baghdad governorate players who train in the stadium of the Ministry of Youth and Sports, the Talent Nurturing Center, Al-Bayaa Youth Forum, and the arena and field stadium of the College of Physical Education and Sports Sciences / University of Baghdad for the 2022 sports season, whose number is (10 players), as the research sample was selected By comprehensive enumeration method, the sample was divided into two groups, the experimental and the control group, with (5 players) for each group

### **Sample homogeneity and evenness:**

**Table (1)**  
**The homogeneity of the research sample**

Variables	Measurement unit	Arthmatic mean	Median	Standard deviation	coefficient of torsion
Long	.Cm	172.198	170.000	1.632	0.298
bloc	.Kg	74.211	72.000	1.354	0.176
Age	Year	17.171	17.000	1.435	0.354

The value of the skewness coefficient is limited to  $\pm 1$ , which indicates a moderate distribution of the population

**Table (2)**

**Shows the results of the pre-tests in the speed endurance tests, strength endurance tests, and the completion of the 400-meter hurdles run for the control and experimental groups.**

Motor abilities	Measurement unit	Experimental group		Control group		Calculated T value	Error level	Statistical significance
		A	STD	A	STD			
Speed endurance	Time	39.675	5.187	41.543	8.432	0.734	0.846	Unsign
Power endurance	Time	17.432	6.758	18.004	7.498	0.987	0.687	Unsign
Achievement 400 meters hurdles	Time	54.765	6.355	55.621	9.443	0.432	0.739	Unsign

Sign Below significance level  $\leq 0.05$  and below 8 degrees of freedom

As for the means of collecting information: (observation, tests and measurements, Arabic and foreign sources and references).

As for the devices, the tools used in the research: (athletics stadium, 40 hurdles, 60 indicators, (6) Japanese-made electronic stopwatches, measuring tape, (1) Sony video camera with a frequency (24 images), a computer Dell portable number. (1) electronic medical scale.

**Tests used in the research:**

- 300-meter speed endurance test. (7) and as it shown by Ruaa Amer and Dr. Bushra (18)
- 100-meter jump exchange test (9) and (5)
- Achievement 400 meters' hurdles: (10) and (11)

**Pre-tests:**

The two researchers conducted the pre-tests on 1/8/2022 in the arena and field stadium of the College of Physical Education and Sports Sciences/University of Baghdad in Baghdad Governorate.

**The main experience:**

- The sample started carrying out training on 1/15/2022 until 3/16/2022.
- Duration of the training program: (8) weeks.

- Number of total training units: (24) training units.
- Number of weekly training units: (3) units.
- Weekly training days: (Sunday - Tuesday - Thursday).
- Training method used: high intensity interval training. and iterative
- The training intensity used: (80-100%).

**Post-tests:**

Post-tests were conducted on 3/19/2022, the arena and field stadium, College of Physical Education and Sports Sciences/University of Baghdad in Baghdad Governorate.

**The statistical methods used in the research:**

The two researchers used the statistical package (SPSS) to find the appropriate statistical treatments.

**Search results:**

View and analyze the results of the differences between the two research groups (experimental - control) for the variables under study  
Presenting the results of the pre and post-tests in the variables speed endurance, heart rate adaptation, and the achievement of 400 meters'

hurdles for the experimental group, and analyzed and discussed them.

**Table (3)**

**Shows the results of the pre and post-tests of the experimental group in the variables of speed endurance, strength endurance, and the achievement of running 400 meters' hurdles under study**

physical variables	Measurement units	Pre test		Post test		A D	Caculte d T value	Error level	Statistical significance
		A	STD	A	STD				
Speed endurance	Time	39.675	3.654	39.001	0.645	0.345	8.672	0.001	Sign
Power endurance	Time	17.432	4.985	17.001	0.765	0.986	5.891	0.000	Sign
Achievement 400 meters hurdles	Time	54.765	8.561	54.234	0.498	0.651	8.671	0.000	Sign

**Sign below significance level  $\leq 0.05$  and below 4 degree of freedom**

Presenting the results of the pre and post tests for the variables of speed endurance, strength endurance, and the completion of the 400-meter hurdles run for the control group, and their analysis and discussion

**Table (4)**

**Shows the results of the pre and post-tests of the control group in the variables speed endurance, strength endurance, and the achievement of running 400 meters' hurdles under study**

physical variables	Measurement units	Pre test		Post test		A D	Caculte d T value	Error level	Statistical significance
		A	STD	A	STD				
Speed endurance	Time	41.543	0.278	40.002	0.645	0.598	7.838	0.000	Sign
Power endurance	Time	18.004	0.756	17.564	0.898	0.554	5.871	0.000	Sign
Achievement 400 meters hurdles	Time	55.621	0.674	55.245	0.441	0.765	8.971	0.000	Sign

**Sign below significance level  $\leq 0.05$  and below 4 degree of freedom**

Presenting, analyzing and discussing the results of the post-tests in the speed endurance tests, strength endurance tests, and the achievement of running 400 meters' hurdles under discussion in the control and experimental groups.

**Table (5)**

**Shows the results of the post-tests in the speed endurance tests, strength endurance tests, and the completion of the 400-meter hurdles run under consideration for the control and experimental groups**

physical variables	Measurement units	Experimental group		Control group		Calculated T value	Error level	Statistical significance
		A	STD	A	STD			
Speed endurance	Time	38.543	0.764	39.432	0.443	4.698	0.001	Sign
Power endurance	Time	16.673	0.631	17.000	0.876	8.952	0.003	Sign
Achievement 400 meters hurdles	Time	53.854	0.985	54.741	0.432	8.562	0.000	Sign

**D. Below significance level  $\leq 0.05$  and below 8 degrees of freedom**

**Results discussion:**

The tables of the pre and post tests show the results of the research variables of the research sample, and the results showed that there are significant differences in the post test in favor of the two groups. used to suit the level of athletes first and the goal of training secondly (4), the intensity that was used was high, and ranged from (80-100%) with the training load that took (8) weeks, and was sufficient to produce these effects, and the intensity The high level is commensurate with the nature of the performance of the 400-meter hurdles run and speed endurance training, and this type of intensity leads to fatigue and is a healthy indicator in sports training, as it leads to adaptation (3), that speed endurance in training is one of the most important abilities that can be used in rationing The rest period between exercises, and this is what was activated in this study, which relied on the pulse rate in rationing the rest period as it is considered one of the very important capabilities of the coach and the athlete because it is easy in the field to measure the heart rate, Jumana Ghazi and Zainab Ali (14) indicated that speed endurance in training is one of the most important abilities that can be used in rationing the rest period between exercises. which gives an indication of the condition of the

training athlete And the effort exerted (1), in addition to the training program that used the method of high-intensity interval training and rationing the rest period on the pulse rate, which led to the development of the special speed endurance, And he confirmed it (17) that the training program that used the method of high-intensity interval training and rationing the rest period on the pulse rate, led to the development of the special speed endurance capacity, Ali Makki (19) emphasized strength endurance as the ability of the body's systems to resist fatigue during continuous effort, which is characterized by its long periods and its connection with levels of muscular strength, Lamia Abdel Sattar and Widad Kadhim (15) confirmed that, without the muscular strength of the runner, with the ability of his muscles to contract and expand with high strength and speed, he cannot run at the speed required by the conditions of the race, As indicated by Hadeel Talib and Suhad Qassim (13), therefore, Haider Abdullah and Osama Ahmed concluded that bearing strength is the ability of the organs to withstand the fatigue and effort generated by the functional organs on the body. In addition to the use of the high-intensity interval training method, it contributed to the development of the level of achievement of 400 meters' hurdles (12), because intensity is one of the basic components on which the training

process is based, especially for activities whose performance is characterized by high intensity (16). Fatigue during continuous effort, which is characterized by its long periods and its association with levels of muscular strength (8), without the presence of the muscular strength of the runner with the ability of his muscles to contract and relax with high strength and speed, he cannot run at the speed required by the conditions of the race, and also for the long distance of the race, endurance is linked to the quality of strength And speed, and this is what helps the runner to complete the race quickly until its final stages in the appropriate performance path.

### **Conclusions:**

Where the researcher concluded and the results showed a remarkable superiority between the pre and post measurement exercises in both high and repetitive interval training methods to develop speed endurance and strength endurance for the experimental group in favor of the post measurement.

The results showed a significant superiority between the pre- and post-measurement exercises in both high and repetitive interval training methods to develop the achievement of the 400-meter hurdles for the experimental group, in favor of the post-measurement.

### **Recommendations**

Whereas, the researcher recommended paying attention to training in both the high and repetitive interval training methods to develop speed endurance, strength endurance, and the achievement of 400 meters' hurdles for under (18) years old.

Conducting similar studies and research on different age groups and for both sexes.

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### Appendix The training model used the first week

Training unit	Exercise Units	intensity %	Repetition	Groups	Rest between	
					Repetition	Groups
Sunday	Run 200 meters standing	85	4	3	.min 1	.min2
	Jumping exercises with alternating gliders		5	2	.min 1	.min2

Tuesday	Run 300 meters standing	85	4	2	.2min	.3min
	Jumping exercises		5	2	.min 1	.min2
Thursday	350m running - standing	85	4	1	.min2	.min3
	Box jumping exercises		5	2	.min 1	.min2

## اثر تدريبات بطريقتا التدريب الفترى المرتفع والتكرارى لتطوير تحمل السرعة وتحمل القوة وانجاز 400 متر حواجز تحت (18) سنة

اسراء كامل حسن، اسماء حميد كمش  
كلية التربية البدنية وعلوم الرياضة للبنات / جامعة بغداد

هدف البحث اعداد تدريبات بطريقتا التدريب الفترى المرتفع والتكرارى لتطوير بعض القدرات البدنية وانجاز 400 متر حواجز تحت (18) سنة، حيث تتحدد مشكلة البحث في ان الانجاز للاعبى هذه الفعالية لا يرقى الى المستويات المقبولة ، نتيجة لضعف في القدرات البدنية والانجاز، عليه اصبح من غير الممكن ان تتطور الا من خلال التدريب المنظم، واستخدمت الباحثتان المنهج التجريبي بالاختبار القبلى والبعدى للمجموعتين التجريبية والضابطة لملائمته لطبيعة البحث، وتم تحديد مجتمع البحث لاعبي المدرسة التخصصية لرعاية الموهبة في للموسم الرياضى 2022، والبالغ عددهم (10 لاعب)، اذ تم اختيار عينة البحث بأسلوب الحصر الشامل وقسمت العينة الى مجموعتين التجريبية والمجموعة الضابطة وبواقع ( 5 لاعب) لكل مجموعة وتم تطبيق تدريبات بطريقتا التدريب الفترى المرتفع والتكرارى ولمدة ثمانية أسابيع وبواقع ثلاث وحدات تدريبية في الأسبوع الواحد واستخدم الباحثتان الحقيبة الاحصائية SPSS وتوصلت الباحثتان إلى أهم الاستنتاجات ان تدريبات الشبكة التدريبية بطريقتا التدريب الفترى المرتفع والتكرارى اثرا ايجابيا لتطوير بعض القدرات البدنية وانجاز 400 متر حواجز تحت (18) سنة

ملخص البحث

تدريبات فترى مرتفع وتكرارى، تحمل سرعة، تحمل قوة، انجاز 400 متر حواجز

الكلمات المفتاحية