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The effect of special exercises according to the relative speed in the development of some physical abilities and the achievement of men's 400-meter run

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Abstract

The aim of the researcher, through his research, is to: Prepare exercises especially according to The kinetic energy index in the effectiveness of the men's 400-meter run And identify the effect of special exercises according to Kinetic energy in developing some special physical abilities and achieving 400-meter running for men The researcher assumed that there are statistically significant differences between the pre and post-tests and in favour of the post-test for the experimental research sample. The researcher identified the research sample as runners in athletics for men, as the research sample included (8) runners. They were distributed randomly by drawing lots into two control and experimental groups, each group consisting of (4) runners, as the experimental group implemented Special exercises Prepared by the researcher, either the control group The same traditional approach was adopted and the researcher concluded that speed endurance training at various distances had a positive effect on the experimental group compared to the control group. He came out with recommendations from it that it is preferable to adopt the standardized exercises prepared by the researcher in training runners for all groups to develop the ability to withstand the particular speed in the 400 m event.

Keywords: Kinetic energy, physical abilities

Introduction

Despite the high sporting achievements that are achieved from time to time by athletes in various sports in general and arena and field games in particular in many countries of the world, which were not the result of chance, but rather the result of a combination of several factors, whether training, physiological, medical, psychological or social In addition to conducting studies and research, scientists, researchers and trainers are still striving to find facts and studies that help the training process in developing the capabilities of the functional body systems of athletes to achieve high-level sporting achievements.

The truth is that all training curricula are built in order to achieve the development of the particular physical capabilities required to perform the practised sports activity, in addition to not using the kinetic energy index when rationing training loads, and therefore the mechanism of physical preparation for athletes aims primarily to develop physical capabilities, following Performance requirements in different athletics races, given that the sport of running (athletics) varies in terms of distances and performance methods to finally achieve digital achievement and its continuous development throughout the successive training curricula.

The importance of the research lies in the adoption of exercises in the training load to develop the endurance of the particular speed through proposed exercises that depend on its preparation according to the kinetic energy to develop this ability because of its great importance and influence in running 400 meters.

Research problem

By looking directly at the Maysan governorate national team, the researcher specialized in this field, being a former player and after having contact with the players, found that the effectiveness of (400 meters) is one of the races that need to develop speed with its particular types.

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Has been found that the use of aspects of special physical abilities is not explicitly included in the training and there needs to be more interest in this crucial aspect since physical abilities have an active role in the development process. For this effectiveness, the researcher decided to use special exercises according to the principle of kinetic energy to develop some physical abilities achievement of running 400m Hence, the research problem arose in the 400-meter running event since this event did not focus on speed endurance for different distances; in particular, The sports training load was not rationed according to kinetic energy, and there was no attempt to adopt modern exercises in rationing the training loads. The researcher noted the weakness in the level of the runners in the last parts of the race distance. All this information was the reason for choosing this problem. Therefore it was studied through the speed method Relativism to train and develop your speed endurance to reach the best possible level according to exercises significantly to develop particular speed tolerance in terms of relative speed.

Research aims

The researcher aims through his research to

1. Preparing exercises, especially according to the Kinetic energy index in the event of running 400 meters for men.
2. Know the effect of special exercises according to the kinetic energy index in developing some special physical abilities and achieving 400 meters for men.

Force search

1. There are statistically significant differences between the pre and post-tests of the research sample.
2. There are significant differences between the experimental and control groups in the tests in favour of the experimental group.

Research areas

1. **Human domain:** Maysan national team players for an effective 400-meter run.

2. **Temporal domain:** 1/5/20 21 to 15/7/20 21_ _.
3. **Spatial field:** Scout camp stadium in Maysan.

Define terms

Kinetic energy index in determining the intensity of training

The kinetic energy index can be defined as the energy needed by the body because of its movement; that is, it depends on the mass of the moving body and the square of its velocity, and this means that the work done here does not achieve heights, but is related to the speed of movement of the body. (Hamid, 2011) [5].

Kinetic energy index = half of the player's mass x velocity squared

The research methodology used

The type of problem is what determines the researcher in choosing the approach that he follows in order to solve his research problem. (Aql, 1987) [3]

Accordingly, the researcher used the experimental method of the two equal groups to suit the problem and its nature to be researched. Experimental research means "a deliberate and controlled change of the limited conditions of movement or several movements". (Mahjoub, 1990) [9]

The research sample was determined by the intentional method of the Maysan governorate athletics team players, as the researcher identified the research sample as runners in athletics for men, as the research sample included (8) runners. They were randomly distributed by drawing lots into two control and experimental groups, each group consisting of (4) runners, as the experimental group carried out Special exercises Prepared by the researcher either the control group adopted the same traditional approach.

Schedule (1)

It shows homogeneity tests for height, age, weight and the value of the coefficient of difference between the experimental and control groups for the 400-meter run.

Table 1: The value of the coefficient of variation for the research variables is less than (30%)

Sequencing	measurements	Arithmetic Mean	Standard Deviation	Value of coefficient difference	The Result
1.	Length (cm)	168	5.08	3.02%	Homogeneous
2.	Age (years)	15.25	0.86	5.63%	Homogeneous
3.	Mass (kg)	56.4	6.14	10.88%	Homogeneous

It appears from Table (1) that the value of the coefficient of variation for the research variables is less than (30%). (Al-Fartousi, 2016) [2].

This means that the research sample is homogeneous among them these variables.

One of the requirements of the experimental design of this study is to identify the line of initiation between the two groups of researchers in the pretests, so the researcher used

the law (T-test) for uncorrelated samples to identify this, as shown in Table (2):

Schedule (2)

It shows the arithmetic means, standard deviations, calculated and tabular t-values, and the level of significance between the pretests of the experimental and control research groups.

Table 2: The values of (T) calculated for all of the experimental and control research groups

Variables and Tests		The group	S	+p	calculated (T)	Degree (Sig.)	Indication
Physical Capabilities	Run at a speed of 120 metres	Experimental	88.33	2.17	1.31	0.22	Non-moral
		Control	87.36	1.40			
	Run at a speed of (1000) metres	Experimental	140.39	2.96	1.52	0.16	Non-moral
		Control	143.34	3.51			
Run achievement (400) metres		Experimental	50.15	1.74	1.27	0.23	Non-moral
		Control	50.38	1.21			

And the level of significance (0.05)

It is clear from Table (2) that the values of (T) calculated for all of the experimental and control research groups were not statistically significant when compared to the values of the (Sig) score that were greater than (0.05), which indicates their equivalence in the pretests and that they are on the same initiation line.

Physical exams

1. Test (run 120 meters) (Karim, 2010) [7]

- **The purpose of the test:** Is to measure speed endurance.
- **Recording:** The recorder records the time that the timekeeper informs him of, from the moment of the test start signal until the arrival of the finish line, and records the time in minutes, seconds and to the nearest part of a second.

2. Test (run 1000 meters) (Awad, 2010) [4]

- **Purpose of the test:** General stress test.
- **Recording:** The recorder records the time that the timekeeper informs him of from the moment of the signal to start the test until the arrival of the finish line and records the time in minutes and seconds to the nearest tenth of a second.

3. 400 meter run achievement

- **The purpose of the test:** To measure the achievement of the effectiveness of 400 meters.
- **Recording:** The registrar records the completion time in the form prepared for this purpose in minutes and seconds to the nearest part of a second.

Rationalizing the intensity of the exercises used according to the maximum kinetic energy index

Based on the law of kinetic energy = 1/2 kW x 2, the researcher carried out exercises with the kinetic energy indicator for the group members. The distance was relied upon by rationing the intensity according to the kinetic energy index, depending on the following law

$$m = \sqrt{i h \times 2 \times n2/k}$$

As an example, Exercise No. (4) When calculating the intensity of 100% for a runner whose mass is (70 kg), the distance travelled was 400 meters and with a time of 55 seconds. To extract kinetic energy, the following is applied:

$$i h = 1/2 \times 2$$

$$i h = 0.5 \times 70 \times 140/55 \times 2$$

$$i h = 35 \times 6.46$$

$$ih = 226.10 \text{ joules, which represents 100\%}$$

Exploratory experience

The researcher conducted an exploratory experiment for the experimental research sample on Wednesday, 5/5/2021, at the

Maysan Olympic Stadium.

The second exploratory experiment aimed to achieve the following

1. Knowing the time required to implement the training units.
2. Identifying the necessary number of auxiliary staff, which the researcher needs when carrying out the main tests and experiments.
3. Recognizing the possibility of the sample on the application of special exercises and how to deal with the method. Identifying the negatives that the researcher will face in order to avoid them in the main experiment.

Identify the time taken to perform tests and measurements.

Pretests

The pretests for the control and experimental groups were conducted on Thursday, 13/5/2021, at four o'clock in the evening at the Maysan Olympic Stadium and the tests were attended by all members of the research sample and a total of (8) runners and the achievement was measured on this day.

Experience

The researcher prepared special exercises to develop some physical variables and complete the 400-meter freestyle run. The researcher worked on controlling the components of the load (intensity-repetitions-rest) in the training units, which the researcher developed gradually and wily with a ratio of (2-3). The researcher used the method of Training (low and high intervals).

He used rest periods between repetitions that ranged from (1-3) minutes, and groups ranged between (2-6) minutes, and this was confirmed by Mcfarine (2009) [11]. He mentioned that the rest period is (1-3) minutes between repetitions and (2-6) minutes between groups for short distances. (Mcfarlane, 2009) [11].

Dimensional tests

The method used in the pre-tests was relied upon in terms of the sequence of conducts, researcher the tests before. The work team, under the supervision of post-tests for the two research groups under the same conditions to give an equal opportunity for both research groups to record the results.

Statistical means

The researcher used the statistical bag (SPSS) and the arithmetic means, standard deviation, median, coefficient of difference and t-test for correlated samples.

Presentation and Discussion

Table (3) it shows the results of the arithmetic mean and standard deviations of the two research groups (experimental and control).

In the pre and post-tests in the tests of physical abilities and achievement.

Table 3: The results of the arithmetic mean and standard deviations of the two research groups (experimental and control)

Landmarks Statistical Variants	Measuring Unit	Tribal		Remote		t value Calculated	Degree	Significance Level	
		Groups	S	p	S				P
Run at a speed of 120 metres	d/th	Experimental	88.33	2.17	85.63	1.53	3,500	0,02	Moral
		Control	87.36	1.40	86.39	2.20	2,829	0.07	Moral
Withstanding a running speed of (800) metres	d/th	Experimental	140.61	2.96	153.26	1.15	7,504	0.00	Moral
		Control	143.75	3.51	160.98	3.04	7,136	0.00	Moral
400 metres _	d/th	Experimental	50.15	2.68	50.70	1.74	5.44	0.04	Moral
		Control	50.38	2.35	50.33	1.21	6.78	0.06	Non-moral

We notice in the tests the superiority of the experimental group over the control group. The researcher attributes this result to the exercises that were applied to the experimental group, which led to the occurrence of adaptations that had an effective impact on the development and development of speed endurance, and this is certainly due to the specificity of the proposed curriculum to develop general endurance. It is an important principle of sports training, which must be taken into account, especially by coaches running the 400 meters, as Macardle points out. The specificity of training causes special adaptations generated from the training process. Special's effects. (Macardle & W.O. *et al.*, 1981) [8]

Muhammad Sobhi mentions". The ability of the athlete increases as a result of the change in training and its intensity works to stimulate all or most of the fibres in a single muscle, by increasing the number of stimuli". Nerve, the number of muscle fibres involved in the muscular contraction will increase accordingly, muscle output increases when performing fast and long-term movements. (Hassanein, 1-1997) [6]

Shaker Al-Daraa mentions, "The results are better whenever the intensity is close to the maximum intensity". (Al-Daraa, 1998) [1]

As for the results of the 1000-meter run test, the researcher attributes this development in the post-test and favour of the experimental group in the 1000-meter run test more than the race distance to the effectiveness of the exercises according to the speed in its focus. Endurance, which contributed to the development of the time of this test; since the distance of this test is greater than the distance of completion (400 meters), it contributed to The exercises that were applied to the experimental group gradually increased the level of endurance according to the proposed exercises, which was reflected in the increase in speed during the test distance.

To test the achievement of running (400) meters between the pre and post-tests of the two research groups and the post-tests between them, it is clear that each of them improved in the tests and the superiority of the experimental group over the control group. The researcher attributes this result to the proposed exercises that were applied to the experimental group of young runners, which led to the development of physical capabilities.

As for the achievement of running (400 meters), the researcher attributes this development, which appeared on the members of the experimental group, is due to the effectiveness of the proposed exercises adopted by the researcher, where he focused mainly on developing remarkable endurance (speed endurance) according to the kinetic energy index. And the method of low and high-intensity interval training from the actual time of the competition This reflects the mutual relationship between endurance and speed in the term speed endurance as compound capabilities that contribute to determining achievement during the race, as the proposed exercises according to kinetic energy have been designed to develop endurance according to the proposed exercises for achievement.

This is what was focused on in the exercises that were applied to the members of the experimental group, which included distances less than the race distance and more significant than the race distance, and increasing the speed in more significant ways the shorter the distance, which included exercises for distances extending between 600-200 meters and according to the proposed exercises to develop exceptional speed endurance And with relatively high frequencies and with

almost maximum intensity, which the researcher relied on in his approach on scientific sources, as the distances, intensity, and rest were codified and organized to develop exceptional endurance according to speed endurance. Resan Kharibet (1998) confirms that "organized and programmed training and the use of rationed types of stress in training and the use of optimal types of rest between repetitions lead to the development of the level of achievement. (Majeed, 1998) [10] Suggested exercises and intensity are according to the average speed of the race through completion in terms of kinetic energy and the return of the pulse to 120.

Table 4: Suggested exercises and intensity are according to the average speed of the race

First Month	The Exercise	Distress	Total Size
The first week is Saturday	200 m×4×2	85%	1600 m
Tuesday	400 m×4	85%	1600 m
Second Week	200 m×5×2	85%	2000 AD
Saturday	400 m x 4 + 200 m x 2	85%	2000 AD
Tuesday	400 m×3×2	90%	240 0 m
The Third Week	600 m×4	90%	24 0 0 pm
Saturday	200 m×4×2	85%	1600 m
Tuesday	400 m×4	85%	8 00 pm
Fourth week Saturday	200 m×4×2	87%	1600 m
Tuesday	200 ×4	87%	1600 m

Conclusions

In light of what the study results showed, the following conclusions were reached:

1. Speed endurance training with a variety of distances had a positive effect on the experimental group compared to the control group.
2. An improvement appeared for the experimental group, compared to the control group, in the completion of the 400-meter run.

Recommendations

1. It is preferable to adopt the standardized exercises according to the kinetic energy index prepared by the researcher in training runners for all groups to develop the ability to withstand the exceptional speed in the 400m event.
2. Interest in developing the ability to withstand speed because of its direct impact on the development of achievement in athletics events for short and medium distances.

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