



## The Effect of Training According to the Target Time on Speed Endurance and Digital Achievement of 400 M Freestyle Runners for the Youth Category

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### Abstract:

The purpose of this paper is to prepare exercises according to the target time according to the scientist (Frank's) equation to develop speed endurance and digital achievement of 400-meter freestyle runners for young men, and to identify the effect of these exercises between the two groups in improving speed endurance and digital achievement of 400-meter freestyle runners for youth. The research hypotheses were that there are differences Statistically significant between the cardio and posttests according to the target time for speed endurance and digital achievement for 400 meter runners for the two research groups (control and experimental). The researcher also hypothesized that there are statistically significant differences between the two tests (pre and post) for training according to the target time for speed endurance and digital achievement for 400 runners. meters for members of the experimental group compared to the control group, and that there were statistically significant differences between the two groups for the post-test as a result of exercises according to the target time and their impact on the variables under study. The exercises are prepared according to the target time to develop speed endurance and achievement for the two research groups (control and experimental) and the achievement of the 400-meter freestyle runners among young men. The researcher used (the experimental method) by designing two groups (control and the experimental group). The researcher identified the research population as runners of the Iraqi clubs for the 400m freestyle event, numbering (10) runners. The researcher chose a research sample in a random manner and they were divided into two groups using the same previous method into two groups (control, experimental). 5 runners per group. The Frank equation was used in training to achieve the target time, the 300-meter running test was used to measure speed endurance, the 400-meter freestyle test was used, and the statistical package (SPSS) was used. The relevant means were chosen by comparing the results in the pre- and post-tests, which are the standard deviation, the arithmetic mean, Levene's test, and the correlation coefficient. Simple Pearson's T-test for matched samples and analysis of variance (F) test. The researcher concluded that training according to the target time and according to the scientist Frank's equation had an effective effect in developing speed endurance and achieving the target time for the 400 m freestyle event for youth. The researcher recommended relying on the exercises that were prepared and according to the target time according to A Frank equation to develop speed endurance and achieve the target time for the youth 400m freestyle event.

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### Introduction:

The world is witnessing development in various aspects of life, which came as a result of scientific cognitive development, reliance on various sciences, benefiting from studies and research and their results, and explaining their importance, especially in the educational and training field, which is witnessing remarkable development and

progress in achievements and their connection to sports fields and the challenges they face, and sports achievements in all sports, including games. The forces in which records develop and are broken from time to time, which indicates that there are efforts being made by specialists, scientists and trainers to reach the best modern technological methods and means available and to use advanced methods to achieve the best sporting achievements by adopting research and studies to prove this in practice.

Athletics in all its activities is one of those games that have wide popularity all over the world through following the course of its competitions and the excitement and suspense it contains in competing and arriving at the strongest, fastest and highest in its activities. The 400 meter freestyle event is considered one of the fast running events and is performed with speed. Less than the maximum, and developing the timed completion of this event requires special physical abilities and physiological requirements that are consistent with its performance and the working system in it is the lactic anoxic energy system.

All this development in knowledge, information, means, methods and methods of training, but the level of development and progress in Iraqi athletics does not meet the level of ambition at the continental or Arab level, and the researcher believes it is necessary to use theoretical sciences in the field of sports training science and apply them in the fields to advance the reality of Iraqi athletics and reach It has reached its previous level continentally, Arably and Asia, especially in the youth 400m freestyle event, through the use of exercises prepared by the researcher based on the target time in rationing and according to the scientist Frank's equation for the training load, where three distances are determined according to the target time for running the 400m freestyle and they are (150m, 300m, 600m). Developing speed endurance and achieving the target time for the 400m freestyle youth event.

The importance of the research lies in directing the attention of coaches and specialists in the 400m freestyle event, relying on Frank's equation to achieve the target time, which is the main criterion for achieving the target time for runners to achieve the achievement, which makes the training process more successful by developing speed endurance and achieving the target time for the 400m freestyle event for young men.

#### **Research problem:**

Through the researcher's experience and his being a practitioner of the 400m event and a representative of several clubs and his follow-up of the races held by the Central Athletics Federation for the 400m freestyle event for youth, in addition to training with several coaches and his knowledge and research into some of the training curricula designed and prepared by the coaches, he noticed that the level of development and achievement of the event and for youth in particular It does not achieve the ambition to reach the Arab and Asian levels, as it reached (the Arab achievement was 47.41 seconds achieved on 3/10/2020, and the best achievement achieved in the Asian continent was 46.51 seconds for this category on 10/23/2020 in Japan). As for the achievement achieved in the Iraqi Championship In 2020 AD, the second round (finals) was 51.16 seconds, in addition to the lack of interest in planning by some coaches and not setting a specific target time for the event and for the runner to train for it or following incorrect methods, which leads to not reaching and achieving the achievement that was set by Before the coach, which leads to a low level of achievement

Therefore, the researcher sought to apply a new method that many runners lack in their training curricula to solve even part of this decline in level and improve level, which are exercises that depend on the target time for completion and according to Frank's equation.

According to the researcher's belief, the coaches of this event and this category did not use this method, and it could play a positive role in developing speed endurance and achievement for this category.

#### **Research objective:**

- prepare training exercises according to the target time for each runner, according to the scientist Frank's equation, to develop speed endurance and achieve the target time for the youth 400m freestyle event.
- identify the effect of prepared exercises on developing speed endurance and achieving the target time for the 400m freestyle youth event.

#### **Research hypotheses:**

- There are statistically significant differences between the two tests (pre and post-test) according to the target time in developing speed endurance and achieving the target time for the 400m freestyle youth event for the two research groups (control and experimental).
- There are also statistically significant differences between the two tests (cardio and post-training) according to the target time for developing speed endurance and achieving the target time for the 400m freestyle youth event for members of the experimental group compared to the control research group.
- There were also statistically significant differences between the two groups in the post-test because of training exercises according to the target time to develop speed endurance and achieve the target time for the 400m freestyle event for youth.

#### **Research methodology and field procedures:**

##### **Research Methodology:**

The researcher used the experimental research method by designing two groups (the control and the experimental group) with a pre-test and a post-test in order to suit the nature of the research problem, its objectives and hypotheses. Table (1) shows the experimental design of the research.

**Table (1) shows the design of the experimental method**

Groups	Pre-test	Experimental method	Post-test
Control	-speed endurance -achievement	Implementing the training program for the trainer	-speed endurance -achievement
Experimental	-speed endurance -achievement	Taking into account the distribution of target time exercises and digital completion	-speed endurance -achievement

##### **Community and sample research:**

The research community was determined by Iraqi club runners, who numbered (30) youth runners who participated in official championships. The research sample was chosen randomly and numbered (10) 400m freestyle runners for youth. They were divided by a simple random method into two groups (control and experimental) with a ratio of (5). ) Runners per group as shown in Table (2).

**Table (2) shows a description of the research community and its sample**

No.	Community	Number community	Sample	Groups	Geographical location	Exploratory group
1	Army	3	2	Control	Baghdad	
2	Aljanceya	2	1	Control	Baghdad	1
3	Al-wasat oil	2	1	Control	Baghdad	
4	South oil	2	1	First experimental	Basra	1
5	Al-ghadeer	2	1	First experimental	Karbala	
6	Aljamaheer	2	1	First experimental	Karbala	
7	Ayn al-tamr	2	1	Second experimental	Karbala	
8	Al-ghadriya	2	1	Second experimental	Karbala	1
9	Hilla	2	1	Second experimental	Babylon	
10	Gourna	2	-	-	Basra	
11	Basra	2	-	-	Basra	
12	Afk	2	-	-	Al-qadisiyah	
13	Najaf	3	-	-	Najaf	3
14	Nineveh	2	-	-	Nineveh	
	Total	30	10			6

**Methods, devices and tools used by the researcher:**

The following methods, devices and tools were used in his current study:

- ✓ Observation
- ✓ Personal interviews.
- ✓ Physical tests.
- ✓ Canon camera))
- ✓ 4 AEWAN stopwatches of Chinese origin.
- ✓ Balance to measure the mass of the runner (1), German origin.
- ✓ Manual calculator of Chinese origin (CASIO).
- ✓ Dell laptop of Chinese origin.
- ✓ Whistle number 3.
- ✓ Red adhesive tape.
- ✓ Aluminum measuring tape, 100 m long.
- ✓ Legal 400m running track.
- ✓ Cones number 8.
- ✓ A logbook to record notes, a score recording form (data), and pens

**Field research procedures:****Determine the tests for the research variables:**

The tests for the research variables were chosen through the researcher's access to specialized scientific sources and references. The following tests were determined for the research variables:

- ✓ A 300-meter running test to measure speed endurance

- ✓ A 400-meter completion test to measure achievement

#### Description of tests:

**First / 300-meter run test from a high start (Muhammad Subhi Hassanain 2001, p. 254):**

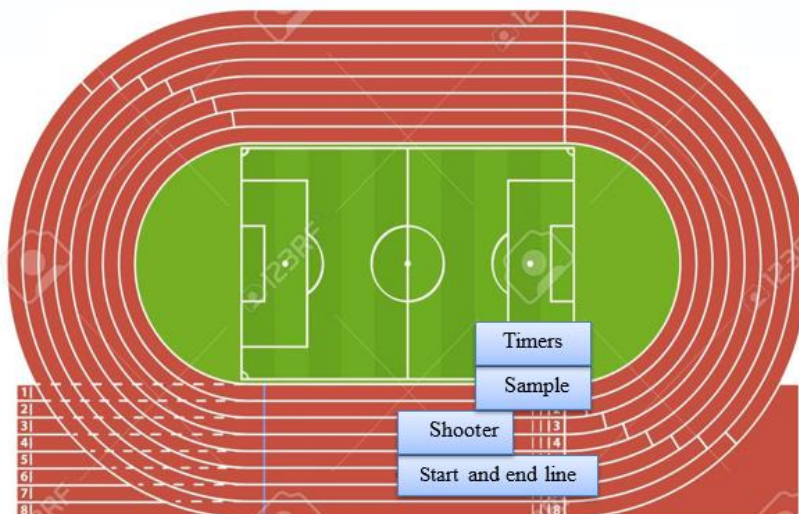
- The purpose of the test: to measure speed endurance..
- Test requirements: 400m legal track and field, stopwatches, timers, assistants, registration, form, shooter, whistle.
- Description of the test: The runner stands behind the start line at the 300-meter line, which is from the end of the first arc, and the start is from a standing position. Upon hearing the start signal (whistle) from the absolute referee, the runner begins to set off to cover the test distance, which is 300 meters, at the fastest possible speed for the runner, and upon reaching the test line. End The timer stops the timing clock as shown in Figure (1).
- Recording the tests: The time is calculated to the nearest (1/100) fraction of a second for the runners and is placed in the form for the test (registration form) by the assistant work team.



**Figure 1. shows a speed endurance test shows a 300 m run**

**Second / The achievement 400 m running test (International athletics law. 2014, p. 274):**

- The purpose of the test: to measure the achievement of running 400 meters.
- Test requirements: an arena and field court (400 m), manual stopwatch number 8, timer, registration forms, shooter, whistle.
- Description of performance: The test begins after hearing the name of the first runner on the registration form, where the runners take their place behind the starting line upon hearing an instruction from the launcher (Take your place). The runner then takes the starting position of sitting at the start line and then an instruction (Present). The race begins when the starting whistle is heard. The runner then runs in the area allocated to him for a distance of 400 meters, and the clock is stopped when the runner reaches the finish line.
- Recording the tests: The recorder records the runners' time on the recording form prepared for this purpose in seconds to the nearest hundredth of a second, as shown in the figure.



**Figure 2. shows the achievement 400 m running test**

#### **Exploratory experience:**

An exploratory experiment was conducted on a sample of the research community (runners), where (6) runners from the community and outside the research sample were tested, and the tests were conducted within two days. On Sunday, 3/3/2022, a 300-meter speed endurance test was conducted, and on Monday, 4/3/2022, a 400m sprint finish was tested. At the Al-Shabab Sports Stadium in Karbala Governorate at exactly nine-thirty in the morning, and the results were recorded in the special registration forms. After a week had passed, the researcher repeated the tests on the same sample from the research community from Sunday and Monday, 11 and 12/3 /2022, at the Al-Shabab Sports Stadium in the Holy Karbala Governorate. At exactly nine-thirty in the morning, in the same order as the tests, the tests were conducted over two days so that injury would not occur among the participating runners, and this would lead to not obtaining true results for the tests. The purpose of the exploratory experiment was:

- ✓ Ensure the validity of the devices and tools that will be used.
- ✓ Ensure the suitability and validity of the tests for the research sample.
- ✓ Identify the time required to perform tests.
- ✓ Training assistants, distributing tasks to them, and taking notes.
- ✓ Identifying the difficulties and obstacles facing the researcher when conducting the pre- and post-tests and the main experiment in order to avoid them.
- ✓ Extracting the scientific foundations for the test.

#### **Pre-test:**

Pre-tests were conducted on the experimental and control research groups, and the tests were distributed over two days. On Wednesday, 14/3/2022, the 300m speed endurance test and the 400m achievement test were conducted on Thursday, 15/3/2022, at 9:30 am. At the Youth and Sports Stadium in Karbala Governorate.

#### **Main experiment:**

After reviewing a group of scientific references and sources, the researcher prepared the exercises according to the target time, and they were included within the trainer's training curriculum to develop the research variables under study for the experimental group. The experimental group was given the exercises prepared by the researcher

according to the target time, and the training level and physical ability of the sample were taken into account. Experimental research by the researcher, and the exercises were characterized by the following:

- The exercises were carried out in the special preparation stage.
- Training began on Saturday, 17/3/2022.
- The training was planned for a period of (8) continuous weeks within the training program for trainers.
- The number of training units per week was (3 units) and the total number of training units prepared was (24 training units) over a period of 8 weeks.
- Training days were: Sunday, Tuesday, and Thursday.
- The time for performing the training unit varied according to the runner's needs and each unit, and the main part ranged from (30:00 minutes) to (52 minutes).
- The researcher relied on a change in the training load (load undulation) in the form (2-1) and the method of repetitive training and high-intensity interval training.
- The intensity used in the training ranged between (80% - 90%) of each runner's maximum ability.
- Rest periods between repetitions were (2-4) minutes and between sets were (3-8) minutes.
- The implementation of these exercises prepared in the training curriculum was completed on Thursday (21/5/2022).

#### **Post-test:**

The researcher conducted post-tests for the control and experimental groups after completing the exercises that were prepared and included in the trainer's training curriculum. The 300m speed endurance test was conducted on Wednesday, 20/5/ 2022, and the 400m completion test was conducted on Thursday, 21/5/ 2022. At exactly nine thirty in the morning. At the Youth and Sports Stadium in Karbala Governorate.

**Statistical methods:** The search data was processed through the Statistical Package for the Social Sciences (SPSS).

#### **Results and discussion:**

This includes presenting, analyzing and discussing the results by conducting the pre-test and implementing the exercises prepared by the researcher in the training program during the period required for the main experiment and conducting the post-test for the research sample. After that, the data was collected, organized and tabulated in explanatory tables and then processed statistically to reach the results. Targeted to achieve the research objectives and hypotheses.

**Presentation, analysis and discussion of the results of the pre- and post-tests of the research variables under study for the control group.**

**Table (3) shows the arithmetic means, the mean differences, the standard deviation, the standard error of the differences, the calculated T value, the type of statistical significance, and the level of significance for the pre- and post-tests of the research variables for the control group.**

Variable	Tests	Measuring unit	Mean	Standard deviation	Arithmetic mean of difference	Standard deviation of differences	T value Calculated	Level sig	Type sig
Endurance speed	Pre-test	Sec	41.1200	.656320	.900000	.320550	2.808	0.048	Sig
	Post-test	Sec	40.2200	.376830					
Achievement	Pre-test	Sec	55.4300	.502000	.630000	.211900	2.973	0.041	Sig
	Post-test	Sec	54.8000	.331660					

Table (3) shows the statistical indicators of the results of the pre-tests and post-tests for the variables that the members of the control group underwent.

The results showed that the value of the arithmetic mean for the speed endurance and achievement variables was lower in the post-test than what it was in the pre-test, and there was a significant change for the two tests and in favor of the post-test. Now these variables have the opposite value, meaning that the lower the value of the arithmetic mean the better the level, because these variables Effectiveness deals with the time factor by measurement, and this is indicated by the level of significance through the adoption of the statistical law (T) for correlated samples, where all variables were less than the level of significance (0.05), which indicated the presence of significant differences between the two tests.

### Discussion:

By displaying and analyzing the results in Table No. (4) of the pre- and post-test of the research variables for the control group, it is clear that there are differences between the pre- and post-tests in favor of the post-test. The researcher believes that the reason for these differences is the continuation of the process of daily sports training for the control group due to its good organization of the components. The load of training and taking into account the individual differences between the runners for this competition led to the manifestation of the differences between the members of this group, and this is what was confirmed by (Sayyed Bassiouni Mustafa 1996) that organized physical training according to the program prepared on scientific foundations leads to the development of various abilities and physical qualities (Sayyed Bassiouni Mustafa 1996). , p. 85). In addition, the training program for members of this control group was targeting and focusing on the capabilities of the event, especially (speed endurance, and digital achievement) for its effective role in improving sports achievement, and this is what was confirmed by (Hussein Ali Al-Ali and Amer Fakher Ashghati 2010) For its effective role in improving sports achievement, and this is what was confirmed by (Hussein Ali Al-Ali and Amer Fakher Ashghati, 2010) that daily training is nothing but (training for the purpose of achieving training goals, and this is done through the implementation of specific methods and methods, as well as the means used when implementing the training program during the preparatory stages. Different and directed to raise the level of achievement of athletes. Therefore (Fan and Teague) refers to the content of training, as well as organizing the development of the form of training according to the goal set or to be achieved) (Hussein Ali Al-Ali and Amer Fakher Shaghati. 2010, p. 19), and also refers to (Adel Turki, 2009 ) "The sum of the exercises or physical efforts carried out in the training units leads to a functional change or adaptation in the athlete's internal body systems and organs to achieve a high level of achievement." (Adel Turki Hassan Al-Dalawi. 2009, p. 2),



This confirmed the improvement of the control group members in the variables under study, which are considered among the basic abilities that relatively short (fast) distance athletes (runners) need in high performance to achieve the best achievement.

### **Presentation and analysis of the results of the pre- and post-tests for the research variables under study for the experimental group.**

**Table (4) shows the arithmetic means, the mean differences, the standard deviation, the standard error of the differences, the calculated T value, the type of statistical significance, and the level of significance for the pre- and post-tests of the experimental group for the included research variables.**

Variable	Tests	Measuring unit	Mean	Standard deviation	Arithmetic mean of difference	Standard deviation of differences	T value Calculated	Level sig	Type sig
Endurance speed	Pre-test	Sec	40.2220	.870930	1.50200	.215460	6.971	.0020	Sig
	Post-test	Sec	38.7200	.576190					
Achievement	Pre-test	Sec	54.7400	.536660	1.92000	.080000	24.000	.0000	Sig
	Post-test	Sec	52.8200	.576190					

Table (4) shows the statistical indicators for the results of the pre- and post-tests for the variables under study to which the members of the experimental group are subjected.

The results showed that the arithmetic mean values for the speed endurance and achievement variables were lower in the post-test than the pre-test, and there was a significant change between the two tests in favor of the post-test because these variables have inverse values, that is, the lower the arithmetic mean value, the better the level, because these activities deal with The time factor in measurement, and this is what the significance levels indicated by using the statistical law (T) for correlated samples, where all the variables under study were less than the significance level (0.05), which indicates the presence of significant differences between the two tests.

### **Discussing the results of the pre- and post-tests for the variables under study for the experimental group**

#### **Discussion of speed endurance results:**

Table (4) shows that there are significant differences between the pre- and post-tests for the speed endurance variable and in favor of the post-test. The researcher attributes these differences to the effects of the standardized exercises prepared by the researcher in a scientific manner and according to the target time and according to the scientist (Frank) equation, which was applied to the members of the experimental group. Of the running exercises for speed endurance at high intensity, and this is what Moayed Abdul Amir Ali agrees with, they quoted from (Mekkelson) (that speed endurance athletes must perform exercises for this ability at high intensity, as their endurance must reach (85-90%) of Maximum heart rate (Muayyad Abd Ali Al-Tai 2017, p. 38). These exercises continued to be applied by the researcher throughout the research period, using the application of the target time and adaptation events to the most important distances (150 m, 300 m, 600 m) in the Frank equation. This training led to the development of the members of the experimental group.

The researcher attributes this development to the exercises that were developed according to the target time through the Frank equation, through which the intensity of the exercise was determined for each runner individually, as well as the training methods and methods by which the exercises were implemented for the runners of the experimental group.

### Discussing the results of the 400m freestyle test:

It was revealed through the presentation and analysis of the results of Table (5) that there are significant differences between the pre- and post-tests and in favor of the post-tests for the experimental group for the achievement variable.

The researcher attributes this development of the post-test of the achievement variable for the members of the experimental group to the exercises prepared by the researcher according to the target time and codifying the exercises on the principles and timings of the three distances in the Frank equation (150 m, 300, 600), as the exercises included exercises over distances longer than race distances and others smaller than distances. The race training included distances of 100m - 600m to develop speed endurance and achieve the target time for the 400m event with relatively high repetitions and less than maximum and maximum stress. This is what is consistent with (Fahim Abdel Wah Issa, p. 114) in his study (The effect of speed endurance training according to the specific time index for the required distances) Which was included in the race training, which the researcher focused on to achieve the highest level of speed endurance and with high intensity for covering the race distance led to the development of the achievement variable (and this is what was confirmed by Barnw) (The use of balanced and comprehensive training leads to avoiding a decline in running speed because special training works to improve... Endurance of speed, which leads to the development of achievement

The researcher believes that the exercises that he prepared with the target time have a decisive and important role in improving the 400-meter freestyle running time through improving (speed endurance) for the experimental group. As well as improving neuromuscular coordination, and speed endurance are a necessary and important factor in achieving the good achievement that occurred in the results of the 400-meter freestyle run.

### Presentation and analysis of the results of post-tests of the research variables for the experimental and control groups:

**Table (5) shows the values of the source of variance, the group and mean squares between and within the groups, the level of significance, the calculated F value, and the type of statistical significance for the post-tests for the experimental and control groups.**

Variable	Source of variance	Measuring unit	M sum squares	Degrees of freedom	Mean squares	F value Calculated	Level sig	Type sig
Endurance speed	Between the groups	Sec	5.641	2	2.821	13.496	.0010	Sig
	Within the groups	Sec	2.508	12	.2090			
Achievement	Between the groups	Sec	10.186	2	5.093	32.201	.0000	Sig
			1.898	12	0.158			

Table (5) shows the statistical indicators for the results of the post-tests of the research variables that the research sample members underwent for the experimental and control groups to find differences between the two groups in the post-tests. The results showed, through the use of the statistical law (F) for independent samples, that the level of significance for all variables was less than the level Significance (0.05), which indicates that there is a significant difference between the two groups with the results of the post-tests.

**Discussing the results of the post-tests for the experimental and control groups under study:**

Table (5) shows the results of the post-tests of the experimental and control groups for the research variable speed endurance, where it was found that there were significant differences for the experimental and control groups and in favor of the experimental group. The researcher attributes the advantage of the experimental group over the control group to the effect of the exercises with the target time prepared by the researcher. The exercises prepared by the researcher were standardized. According to the target time and its plan, so that the target time is achieved, and this is what was confirmed by (Ahmed Youssef Miteb, 2014, p. 146) "Planning is one of the most important predictive procedures that depends on many studies of reality and taking into account experiences, existing capabilities and capabilities, and what can be determined to achieve a specific goal. It is preparing athletes to reach the highest levels of achievement." The exercises were applied in a method of high-intensity repetitive and interval training, and these exercises were regulated based on the target time and according to the ability of the runner by using the scientist Frank's equation, and this is what agreed with (Alaa Falih Jawad. 2008, p. 49). In his study, "it included speed endurance training using distances specified for this characteristic that were less than a race distance and others larger and with different intensities ranging between (80-95%) of the runner's maximum ability." After the researcher followed the training of the control group and supervised the training of the experimental group through communication with the coach and runners alike, the researcher attributes the development of the experimental group over the control group to the exercises that were prepared according to the target time by the researcher, as the exercises included speed endurance exercises according to Frank's equation. These exercises were regulated according to the time of the three distances (150m, 300m, 600m), which were part of the lactic acid training, and the exercises were performed while in a state of fatigue, meaning that the runner did not return to his normal state. This was confirmed by (Jamal Sabry Faraj, 2018, p. 365): "Running short distances with relatively short rest periods better prepares them for the requirements of their sports." Through the researcher's knowledge and modest experience, he believes that regulated exercises are anaerobic exercises with high intensity that lead to an increase in the lactic energy production system, and lead to an increase in the muscle's ability to endure lactic acid in the working muscles for the longest possible period, and this in turn is reflected in the speed endurance ability.

The researcher attributes the advantage of the experimental group over the control group to the exercises according to the target time according to the scientist Frank's equation prepared by the researcher. In the achievement variable, there were significant differences in favor of the experimental group at the expense of the group and the control group. The researcher attributes the advantage of the experimental group over the control group to the exercises prepared by the researcher according to the target time, which characterized these exercises by developing speed endurance and digital achievement. The exercises were applied in the method of repetitive training and the method of high-intensity interval training. And with the lactic anaerobic energy system, exercises with this system are performed in conditions of insufficient oxygen, which leads to the formation of lactic acid, as pointed out by (Jamal Sabry Faraj, 2012, p. 299): "This system is necessary for exercises that must be carried out within a maximum period (30 seconds - 3 minutes). The main system on which distance running (400m, 800m) is based.

All of the above shows that the exercises according to the target time, which were carried out using the high-intensity and repetitive interval method, and which were

carried out on the experimental group, are what led to the experimental group being superior to the control group. Also, the control group was limited to the trainer's exercises, and if they used some of them, the method and manner in which the experimental group's exercises were implemented would remain different.

### **Conclusions and Recommendations:**

#### **Conclusions:**

Through the results presented and the researcher's analysis and discussion of these results, we conclude the following:

- The exercises that were prepared by the researcher according to the target time had a significant impact on improving the level of (speed endurance)
- There was a better improvement in the 400-meter freestyle running performance as a result of training according to the target time according to Frank's equation than the training of the control group.
- The effectiveness of training according to the target time has a clear impact on developing speed endurance and the digital achievement of young 400m runners.

#### **Recommendations.**

The researcher recommends the following:

- It is recommended to adopt the exercises that were prepared by the researcher according to the target time according to Frank's equation to develop speed endurance and digital achievement for young 400m runners.
- It is necessary to conduct a study similar to this study, on other categories, characteristics, or activities, and on other age groups, as well as gender.
- Conducting experimental research on training according to the target time for middle-distance runners (800 metres, 1500 metres) and even long distances as well (3000 meters freestyle, including 3000 meters steeplechase, 5000 meters, 10000 metres), as their completion is linked to achieving the shortest possible time.

### **References**

1. Muhammad Subhi Hassanain. 2001. Measurement and evaluation in physical education and sports: Cairo, Dar Al-Fikr Al-Arabi, p. 254.
2. International athletics law. 2014. Translated by Sarih Abdul Karim: Baghdad, Dar Al-Diyaa Printing, p. 274.
3. Ahmed Youssef Miteb. 2014. Sports Training Skills: Amman, Safaa Publishing and Distribution House, p. 146.
4. Alaa Falih Jawad. 2008. The effect of a training curriculum in terms of pulse and time to develop maximum speed, special endurance, and achievement for young 400m runners: Master's thesis, College of Physical Education and Sports Sciences, Al-Qadisiyah University.
5. Jamal Sabry Faraj. 2018. Speed and athletic achievement: Beirut, Dar Al-Kutub Al-Ilmiyya.
6. Jamal Sabry Faraj. 2012. Strength, ability and modern sports training: Amman, Dar Degla,.
7. <https://www.worldathletics.org/records/toplists/sprints/400metres/outdoor/men/u20/2020?regionType=area&region=asia&timing=electronic&page=1&bestResultsOnly=true>