Multi-track endurance training impact on (Galactin-3) some of the Physiological and Physical Variables and the Record Level of The Long-Distance Swimmers

Pro. Dr. / Abeer Jamal Shehata

Introduction and research problem

Swimming is one of the most prominent sports among the various sports. It is one of the sports that translated into the era of the age we live in. It is the fusion of science with work and theory with application. It is a great burden on the central nervous system.,

Because of the work of all body parts and its members full consensus requires the extent commensurate with the multi-pool purposes, scientists have proved that the human acclimate to different effects depending on activity practiced, and that the enormous development in the swimming competitions and indices achieved is not born of health

The use of modular exercises for the development of endurance of a single motor track, which depends mostly on aerobic performance, does not improve the various physical, skill and digital abilities of swimmers, as swimmers tend to seek change, innovation and creativity in training, which increases their motivation and performance without interruption to achieve the highest levels Performance, This gives special importance to multi-track and multi-track endurance exercises designed to enhance the abilities of players

Rania Abdullah (2001) notes that various endurance exercises are a series of different intensity training exercises in multiple directions, shapes and distances that increase the ability to cope with fatigue resulting from high physical exertion for as long as possible. (21: 257)

Aerobic endurance plays a major role in maintaining steady-level performance throughout the long-distance race. This is an important and effective factor and contributes significantly to the win (1: 88.)

Fink Weineck (2009) notes that exercises, which aimed at developing and improving endurance, must be varied and variable in a competitive

manner, which contributes to maintaining the performance level for a long time.

This type of training must be innovative, stimulating and encouraging athletes towards Development of the instability of the rhythm which does not cause boredom during performance and contributes to the development of special endurance and this is achieved by various endurance exercises and multi-track motor (26:55.)

Mohammed Ali Al-Qatt (2002) points out that distance swimmers need anaerobic endurance training so that they can finish their race quickly and are tired, so their training programs should include all forms of endurance training (179: 10)

Abul-Ela 'Abd El-Fattah, Mohamed Allawi (2003) reported that increased heart size was associated with increased motor activity. This phenomenon has been observed since the 18th century. The physiological-pathological evaluation of increasing the size of the heart continued to take conflicting directions until it was called the sports heart.

The size of the heart of the athlete includes increasing the widening of the heart cavity, increasing the size of the heart muscle and combining the increased lumen expansion and increasing muscle size as a whole. (21: 1)

Galactin-3 is one of the new and promising signs of heart failure and myocardial infarction. Although endurance training is an important component in the prevention of cardiovascular disease, the relationship between training and levels of galactin-3 in plasma is still unknown,

Now, the relationship between regular training and myocardial infarction is still not fully understood and it can be confirmed that the latest developments in Glactin-3 research are to focus on the role that Glactin-3 plays in the occurrence and development of cardiac failure.

The role of galactin-3 in diagnosing the physiological disease of heart failure has recently been suggested. Several studies have shown the large regulatory role of galactin-3 in bloated hearts, its stimulating effect on phagocyte cells,

The spread of fibroids, and the development of fibrosis. Cardiac formation is a very important determinant of clinical outcomes of heart failure and is associated with disease progression and pathway (75:14)

Previous research related to the study of Robert Hatash (2013), 23, entitled "Increase of **Glactin-3** in endurance athletes, and the study of Anret La jirsh (2012) 12, entitled" Right ventricular dysfunction resulting from training and restructuring of the endurance athletes.

These studies aimed to identify the effect of different training loads or the exercise of some sports activities on **Galactin-3** and some physiological variables in long-distance swimmers.

The researcher did not find a study on the effect of multi-track endurance on **Galactin-3** and some physiological variables in long-distance swimmers.

Therefore, the researcher studied the relationship between multi-track endurance training and **Galactin-3** levels. In the long-distance swimmers' plasma due to the special nature of long-distance swimming competitions involving a combination of maximum and medium loads during the race,

As well as the impact of multi-track endurance exercises on some physiological and digital Long-distance search sample

Study goal:

The aim of this study is to identify the effect of multi-track endurance training at the level of **Galactin-3** and some physiological, physical and digital variables of long-distance swimmers

Research hypotheses

١ -There are statistically significant differences between the averages of the pre and post measurements at the level (**Galactin-3**) and some physiological, physical and digital variables of long-distance swimmers.

٢ -There are statistically significant differences between the averages of the pre and post measurements at the level of (Galactin-3) and some physiological, physical and digital variables of the long-distance swimmers control group.

-There were statistically significant differences between the mean of the two dimensional measurements in the experimental and control groups at the level of galactin-3 and some physiological, physical and digital variables for the long-distance swimmers and for the experimental research group.

Research Method and Procedures:

In order to achieve the objectives of the research and test the hypotheses, the researcher followed the following steps:

First: Research Methodology:

The researcher used the experimental method because of its suitability to the nature of the research using experimental design. The two groups are equal, one is experimental and the other is controlled by following the pre and post measurements of both groups.

Second: Community and Research Sample:

The research community included two long-distance swimmers at the **Hamad Aquatics Complex** in Qatar for the training period (2015-2016) and registered with the Qatar Swimming Federation.

The researcher chose the sample of the research by the intentional manner of swimmers (15-17 years old) (٢٤) swimmers were divided into two equal groups of each (12) swimmers, one experimental and the other control Ten (8) swimmers from the research community and outside the original sample were selected to calculate the scientific transactions of the tests in question, as well as conducting exploratory studies on the research.

Distribution of sample members moderately:

The researcher checked the frequency of experimental distribution and control groups in the light of the following variables: Anthropometric measures of age, height, weight, training age, physiological, physical and digital variables in question and Table (1.)

Table (1)
The mean, median, standard deviation, torsion coefficient for growth rates, physiological, physical and digital variables are under consideration for experimental and control groups N = 32

Torsion coefficient	Mediator	standard deviation	SMA	Measuring unit	Variables	
٠.٦٣	١٦.٥٠	٠.٦٧	١٦.٥٨	Year	age	Anthropometric measures
٠.٢١	١٧٢.٠٠	٣.٢٥	١٧٢.٣٢	Cm	Height	
٠.٥٢	٧١.٠٠	٢.٦٩	٧١.٣٦	Kg	Weight	
٠.٢٢	٨.١٠	٠.٦٤	٨.١٢	Year	The training age	
٠.٤٧	٩٢.٥٠	٢.٦٥	٩٢.٩٨	Milletr/kg/M	Anaerobic capacity	Physiological variables
٠.٣١	٤٤.٥٠	١.١٧	٤٤.٩١	Milletr/kg/M	VO2max	
٠.٨٩	٢.٦٠	٠.٦٦	٢.٦٥	Milletr	Vital Capacity	
٠.٣٢	٧.٩٠	٠.٩٨	٧.٩١	Up to 14 ng/ml	Galactin-3	Galactin-3
٠.١١	٢٧١.٠٠	٣.٥١	٢٧١.٦٩	Up to 390 pg/ml	pro BNP	
٠.٠٠٣٦	٩.٠٠	٠.٦١	٩.١٧	Up to 20 pg/ml	Troponin cTnI	
٠.٠٠٨٧	٢٤٠٠.٠٠	٥.٦٩	٢٤١٢.٣٦	M	Endurance (Cooper)	Physical variables
٠.٠٢٥	٣١.٦٠	١.٢١	٣١.٦٩	Cm	Vertical jump	
٠.٠٣٢	٩.٢٠	٠.٦١	٩.٢١	M	Threw a medical ball	
٠.٨٧	١٥.٢٠	٠.٦٧	١٥.٢١	Second	Running 30 m × 5	
*٠.٤٥	٦٠٥	*٠.٩٤	٦٠٨	Second	Swimming pool (800 m) free	
*٠.٣٦	١٠٤٠	*١.٠٨	١٠٤٧	Second	Swimming pool (1500m) free	

Table 1 shows that the values of the sphincter coefficients for each of the anthropometric measures of age, height, weight, training age, physiological variables, level of Galactin-3 ,physical and numerical variables of the research sample are limited to (+3, -3) To the moderation of the distribution of the sample members in those variables

Equivalent of 2 research groups:

The researcher found the equivalence between the control and experimental groups in the light of the following variables: Anthropometric measures of age, height, weight, training age, physiological variables, level of Galactin (3), physical and numerical variables in question, and table (2).

Table (2)
Arithmetic means, standard deviation, and calculated values between the control and experimental groups in both anthropometric and physical variables، Glactin (3) is under investigation (N = 24)

Level of significance	Value (T)	Control group		The experimental group		Measurement unit	Variables	
		e	s	e	s			
Not functional	٠.٦٩	٠.٨٧	١٦.٣٨	٠.٦٩	١٦.٤٤	Year	age	Anthropometric measures
Not functional	٠.٦٣	٠.٢٢	١٧٣.١٦	٠.٢٧	١٧٤.٣٦	Cm	Height	
Not functional	٠.٢١	٠.١٤	٧١.١٤	٠.٨٦	٧١.١١	Kg	Weight	
Not functional	٠.٤٧	٠.٣٢	٨.١٢	٠.٤٥	٨.٠٥	Year	The training age	
Not functional	٠.٦٥	٠.٥٨	٩٠.٦٤	٠.٣٣	٩١.٦٥	Milletr/kg/M	Anaerobic capacity	Physiological variables
Not functional	٠.٢١	٠.٣٢	٤٤.٥١	٠.٧٨	٤٤.٦٥	Milletr/kg/M	VO2max	
Not functional	٠.١١	٠.١١	٢.٦٠	٠.٤٢	٢.٦١	Milletr	Vital Capacity	
Not functional	٠.٨٧	٠.٤٧	٧.٨٥	٠.٣٦	٧.٨٨	Up to 14 ng/ml	Galactin-3	Galactin-3
Not functional	٠.٣٦	٠.٠٣١	٢٧٠.١٨	٠.٢١	٢٧٠.٣٦	Up to 390 pg/ml	pro BNP	
Not	٠.٢١	٠.٥٨	٩.٠٦	٠.٢٥	٩.١١	Up to 20	Troponin	

functional						pg/ml	cTnI	

Follow Table (2)
Arithmetic means, standard deviation, and calculated values between the control and experimental groups in both anthropometric and physical variables، Glactin (3) is under investigation (N = 24)

Level of significance	Value (T)	Control group		The experimental group		Measurement unit	Variables	
		e	s	e	s			
Not functional	٠.٥٣	٠.٦٣	٢٤٥١.٢٨	٠.١١	٢٤١٠.٣٢	Cm	Endurance (Cooper)	Physical variables
Not functional	٠.٥١	٠.٢١	٣٠.٨١	٠.٩٦	٣٠.٨٤	M	Vertical jump	
Not functional	٠.٢٢	٠.٧٤	٩.١١	٠.٣٢	٩.١٨	M	Threw a medical ball	
Not functional	٠.١٧	٠.٣٢	١٥.٠٦	٠.١٧	١٥.١٢	Second	Running 30 m × 5	
Not functional	*٠.٥١	*٠.٦٩	٥٨٤	*٠.٨٧	٦٠١	Second	Swimming pool (800 m) free	
Not functional	*٠.٢١	*٠.٥١	١٠٠٧	*٠.١١	١٠١٤	Second	Swimming pool (1500m) free	

The value of (t) the tabular level of significance (0.05) = 1.701

Table 2 shows that there are no statistically significant differences between the experimental and control groups in the anthropometric measures of age, height, weight, training age, physiological variables, physical variables, level of galactin (3) and the digital level. C) calculated less than the value of (t) tabular at the significance level (0.05) indicating their equivalence in those variables.

Tests, which used in research:

The researcher conducted a survey study of the scientific references and previous studies

in the field of swimming (1) (2). (4), (12), (15) Most studies have agreed that the most important physical variables (Endurance - Muscle capacity - The most important physiological variables were (Anaerobic capacity - maximum oxygen consumption - Biological capacity) and laboratory analysis of the level of (Galactin 3) and the digital level of long distance swimmers. Accordingly, the researcher

A) Physiological tests: Attachment (2)

•Aerobic force measurement test (maximum oxygen measurement)

•Anaerobic power measurement test.

•Dynamic capacity testing

B) Physical testing facility (2)

•General endurance component test (Koper running and walking test 12 minutes)

•Selection of speed endurance component (30 x 5 sprint test)

•Test the measurement of the speed strength of the two men (vertical jump test of stability)

•Test the measurement of the speed strength of the arms (test throw a ball of nature to the farthest distance)

C) Testing of the level of Galactin 3 in laboratory analysis.

D) Digital level (800 m - 1500 m) free

Search tools and devices:

The researcher used the following tools and devices:

١-Registration form for swimmers' data and test results: Annex (1)

٢ -Medical balance to measure the weight of players in kilograms.

٣ -Resistometer to measure length in centimeters.Lewis Nomogram.

٤ -Stopwatch

٥ -Olympic Swimming Pool.

٦ -Syringes + medical cotton + ice-cream.

Multi-Track Endurance Exercise Program:

The researcher developed a multi-track endurance-training program after a reference analysis of the scientific references and access to the information network and see examples of these exercises.

Foundations of the program:

١ -Taking into account the individual differences among the members of the research sample in order to achieve the research objective.

٢-The continuous and gradual increase in the difficulty of exercise and the number of repetitions.

٣ -The rest period between exercises should be sufficient for the members of the research sample to reach the appropriate rest.

٤ -The intensity of the drillings was rationed according to the pulse rate by the following equation. Maximum pulse rate = 220 - chronological age.

٥- Taking into account the scientific foundations of sports training in proportion to the Sunni stage and the training status of the research sample.

٦-Link the physical and digital aspects during the performance of the content of the implementation of the program.

Program Planning:

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Based on the pre measurement of the research sample, the researcher was able to connect to the following:

١ -Total program time (12) Twelve weeks.

٢ -Number of training units during the week (5) five units.

٣-The total number of units (60) sixty units of training.

The researcher divided the implementation period into three stages.

١ -The general preparation stage lasted (4) weeks.

٢-Special preparation stage and took (5) weeks.

٣ -Pre-competitions took 2 weeks.

Steps to Conduct the Experiment:

Postal Measurements:

The researcher conducted the postal measurements in the tests under study before the implementation of the program on the experimental and control groups from 25/12/2016 to 30/12/2016 in the following order measurements anthropometric measures followed by physiological measurements followed by the sampling of laboratory analysis of Glacatin - 3 by a specialist doctor From **Aspeter Medical Medicine** Hospital followed by physical measurements and at the final digital level for swimming 800m and 1500m freestyle.

Application of the program:

The training program was applied to the experimental group in the period from 2/10/2016 to 22/12/2016. Both groups followed the water-

training program with the percentage and time allocated for all settings with the experimental group program except for the various endurance exercises.

Dimension measurements:

Post-measurements of all the tests in the experimental and control groups were carried out from 25/12/2016 to 29/12/2016.

View and discuss the results

Table (3)

The significance of the differences between the pre and postal measurement in the level of some physiological and physical variables and the galactin (3) and the digital level of experimental group swimmers (N = 12)

Level of significance	Value (T)	Improvement rate	Differences between the two averages	Post Measurement		Pre Measurement		Measuring unit	Variables	
				e	s	e	s			
Significantly	٤.٦٩	%٤٣.٦١	٣٩.٩٧	٠.١٧	١٣١.٦٢	٠.٣٣	٩١.٦٥	Milletr/kg/M	Anaerobic capacity	Physiological variables
Significantly	٤.٦١	%١٩.١٧	٨.٥٦	٠.٦٣	٥٣.٢١	٠.٧٨	٤٤.٦٥	Milletr/kg/S	VO2max	
Significantly	٤.١٢	%١٨.٧٧	٠.٤٩	٠.٢١	٣.١٠	٠.٤٢	٢.٦١	Milletr	Vital Capacity	
Significantly	٤.٨٥	%٦٧.٦٣	٥.٣٣	٠.١٧	١٣.٢١	٠.٣٦	٧.٨٨	Up to 14 ng/ml	Galactin (3)	Galactin (3)
Significantly	٤.٣٢	%١٥.٢٦	٤١.٢٦	٠.٦٣	٣١١.٦٣	٠.٢١	٢٧٠.٣٦	Up to 390 pg/ml	pro BNP	
Significantly	٤.٢١	%٩٣.٤١	٨.٥١	٠.٥٤	١٧.٦٢	٠.٢٥	٩.١١	Up to 20 pg/ml	Troponin cTnI	
Significantly	٤.٩٦	%٨.٥٠	٢٠٤.٨٩	٠.٧٤	٢٦١٥.٢١	٠.١١	٢٤١٠.٣٢	M	Endurance (Cooper)	Physical variables
Significantly	٤.٢٧	%١٤.١٦	٤.٣٧	٠.٣٢	٣٥.٢١	٠.٩٦	٣٠.٨٤	Cm	Vertical jump	
Significantly	٤.٣٦	%٢٣.٣١	٢.١٤	٠.١٨	١١.٣٢	٠.٣٢	٩.١٨	M	Threw a medical ball	
Significantly	٤.١١	%٢٢.٣٣	٢.٧٦	٠.٣٢	١٢.٣٦	٠.١٧	١٥.١٢	S	Running 30 m × 5	
Significantly	٤.٦٣	%٣.٤٠	٠.٢١	٠.١٧	٥٤٠	٠.٨٧	٦٠١	S	Swimming pool (800 m) free	
Significantly	٤.٣٢	%٢.٧٣	٠.٢٨	٠.٦٢	٩٨٦	٠.١١	١٠١٤	s	Swimming pool (1500m) free	

The value of (t) tabular at the degree of freedom (28) and the level of significance (0.05) = 1.782

It is clear from Table (3) that there are statistically significant differences between the averages of the pre and post measurements at the level of some physical, physiological, digital and galactic variables 3 and for the sake of post , where the value of (t) is greater than

its value at the significance level (0.5)

Table (4)

The significance of the differences between the pre and post measurement in the level of some physiological and physical variables and the galactin (3) and the digital level in the swimmers control group control (N = 12)

Level of significance	Value (T)	Improvement rate	Differences between the two averages	Post Measurement		Pre Measurement		Measuring unit	Variables	
				e	s	e	s			
Significantly	٣.١٨	%١١.٠٨	١٠.٥٠	٠.٥٢	١٠٠.٦٩	٠.٥٨	٩٠.٦٤	Milletr/kg/M	Anaerobic capacity	Physiological variables
Significantly	٢.٩٨	%٩.٢٣	٤.١١	٠.١٧	٤٨.٦٢	٠.٣٢	٤٤.٥١	Milletr/kg/S	VO2max	
Significantly	٢.٤٧	%١١.٩٢	٠.٣١	٠.١١	٢.٩١	٠.١١	٢.٦٠	Milletr	Vital Capacity	
Significantly	٣.٢٦	%١٨.٢١	١.٤٣	٠.٦١	٩.٢٨	٠.٤٧	٧.٨٥	Up to 14 ng/ml	Galactin (3)	Galactin (3)
Significantly	٣.٢١	%٧.٠٦	١٩.١٠	١.٥٢	٢٨٩.٢٨	٠.٠٣١	٢٧٠.١٨	Up to 390 pg/ml	pro BNP	
Significantly	٣.٢٧	%١٧.٩٩	١.٦٣	٠.٢٦	١٠.٦٩	٠.٥٨	٩.٠٦	Up to 20 pg/ml	Troponin cTnI	
Significantly	٢.٩٦	%١.٨١	٤٤.٥٩	٣.٠٢٥	٢٤٩٥.٨٧	٠.٦٣	٢٤٥١.٢٨	M	Endurance (Cooper)	Physical variables
Significantly	٢.٤٨	%٤.٣١	١.٣٣	١.٣٢	٣٢.١٤	٠.٢١	٣٠.٨١	Cm	Vertical jump	
Significantly	٣.٤٧	%١٢.٠٧	١.١٠	٠.٦٣	١٠.٢١	٠.٧٤	٩.١١	M	Threw a medical ball	
Significantly	٣.٢٢	%١٤.٩٦	١.٩٦	٠.٢٥	١٣.١٠	٠.٣٢	١٥.٠٦	S	Running 30 m × 5	
Significantly	٣.٦٤	%٢.١٦	٠.١٣	٠.٨٤	٥٧١	٠.٦٩	S	S	Swimming pool (800 m) free	
Significantly	٣.١٧	%١.٨٥	٠.١٩	٠.٦٣	٩٨٨	٠.٥١	s	s	Swimming pool (1500m) free	

The value of (t) tabular at the degree of freedom (28) and the level of significance (0.05) = 1.782

Table (4) shows statistically significant differences between the averages of the preand remote measurements at the level of some physical, physiological, digital and galactin variables 3 and for the sake of telemetry. The value of the tabular value

is greater than its value at the significance level (0.5)

Table (5)
The significance of the differences between the two dimensions in the experimental and control groups at the level of some physiological, physical, and galactic variables (3) and the digital level A pilot search group swimmer (N = 24)

Level of significance	Value (T)	The Control group		The experimental group		Measuring unit	Variables	
				e	s			
Significantly	٣.٢٥	٠.٥٢	١٠٠.٦٩	٠.١٧	١٣١.٦٢	Milletr/kg/M	Anaerobic capacity	Physiological variables
Significantly	٣.١١	٠.١٧	٤٨.٦٢	٠.٦٣	٥٣.٢١	Milletr/kg/S	VO2max	
Significantly	٣.٤١	٠.١١	٢.٩١	٠.٢١	٣.١٠	Milletr	Vital Capacity	
Significantly	٣.٢٦	٠.٦١	٩.٢٨	٠.١٧	١٣.٢١	Up to 14 ng/ml	Galactin (3)	Galactin (3)
Significantly	٣.١١	١.٥٢	٢٨٩.٢٨	٠.٦٣	٣١١.٦٣	Up to 390 pg/ml	pro BNP	
Significantly	٣.١٤	٠.٢٦	١٠.٦٩	٠.٥٤	١٧.٦٢	Up to 20 pg/ml	Troponin cTnI	
Significantly	٣.٦٩	٣.٠٢٥	٢٤٩٥.٨٧	٠.٧٤	٢٦١٥.٢١	M	Endurance (Cooper)	Physical variables
Significantly	٣.١٧	١.٣٢	٣٢.١٤	٠.٣٢	٣٥.٢١	Cm	Vertical jump	
Significantly	٣.١١	٠.٦٣	١٠.٢١	٠.١٨	١١.٣٢	M	Threw a medical ball	
Significantly	٣.٢٥	٠.٢٥	١٣.١٠	٠.٣٢	١٢.٣٦	S	Running 30 m × 5	
Significantly	٣.٢١	٠.٨٤	٥٧١	٠.١٧	S	S	Swimming pool (800 m) free	
Significantly	٣.٧٤	٠.٦٣	٩٨٨	٠.٦٢	s	s	Swimming pool (1500m) free	

The value of (t) the tabular at the degree of freedom (28) and the level of significance (0.05) = 1.701

Table (5) shows statistically significant differences between the averages of the two-dimensional measures in the experimental and control groups at the level of some physical, physiological, numerical and galactic variables. 3 For the sake of telemetry, 0.5

Discussion of results:

Table (3) shows that there are statistically significant differences between the averages of the preand remote measurements at the level of

some physical, physiological, digital, and galactic variables 3 and for the sake of telemetry. The value of (t) is greater than its value at the significance level (0.5)

The results of Table (3) indicate the improvement of physiological, physiological and numerical variables and the concentration of the Galactin rate (3).

The researcher is referring to the training program and its endurance exercises with various motor paths, Characterized by speed, which was reflected in the improvement of anaerobic capacity.

Hatem Hosny (2003) said that increased muscular strength contributes to increasing the ability to work and to maintain the accumulation of lactic acid at work and the speed of oxidation by the muscles not directly involved in the performance,

As well as increase the efficiency of the body in the speed of disposal of lactic acid in rest and (3: 258). The strength of speed is characterized by the rate of conversion of energy into labor. Aden phosphate troposphere is one of the important sources in the muscle as well as the ability of the muscle to benefit from the energy stored therein (3: 258)

Abo El-Ola Abdel-Fattah, Mohamed Allawi (2003) points out that the maximum consumption of oxygen indicates the ability of the heart and lungs to transfer oxygen to the muscles during performance. This task is performed by three main organs in the body, namely the circulatory, respiratory and musculoskeletal system.

If the respiratory system supplies oxygen to the circulatory system to transport it to the muscles, the muscles cannot consume the oxygen it receives through the circulatory system even in the case of high performance, so that the muscles are the determining factor for the efficiency of the aerobic athlete

The results of this study are consistent with Montgomery, **Menen and Yain** (2010), where the results of this study indicate that the maximum consumption of oxygen is one of the important variables that is considered an

indicator of the fitness of the players.

It is clear from the current study that there is a strong correlation between improving physiological variables and improving physical abilities and level of galactin (3) as they affect each other and one cause improvement in the other.

In this regard **Issam Abdel Khalek** (2005) proving that more body organs, and the more positive these changes, the higher the level of athletic performance, including aerobic and anaerobic changes to produce the energy necessary for motor performance (7: 195)

This result is consistent with the study of **Amr Abdelmutallab** (2002) (8) and **Hedeke** (1996). The results indicated that endurance exercises increase muscle efficiency in oxygen consumption, as muscle fibers are responsible for long-term muscular performance which containing more of the capillaries surrounding each fiber, allowing the spread of oxygen and the speed of disposal of metabolic waste.

Table 3 shows statistically significant differences in the effect of endurance on galactin 3 after the performance of multivariate physical pregnancy.

In the interpretation of the results, an increase in the Galactin-3 ratios in post tests was shown in the post measurement,

From the study sample, but the rise of galactin-3 in the plasma significantly in the athletes endurance after the race and the opinions of scientists differed between those who support it is not linked to the performance of the heart, other biological signs, or myocardial infarction, In addition, others see it as a strong indicator of signs of fibrosis myocardial muscle is exposed to the dangers of injury Heart disease, especially after the cessation of exercise. (87:16)

The results of the first hypothesis of the research hypotheses, which states that there are differences of statistical significance between the averages of pre and post measurements at the level (galactin-3) and some physiological variables, physical and digital level of

long-distance swimmers experimental research group.

Table (4) shows that there are statistically significant differences between the averages of the pre and post measurements at the level of some physical, physiological and digital variables of long distance and galactic mass (3) and for the sake of telemetry. The value of (t) is greater than its value at the level of significance (0.5)

Table 4 shows an improvement in the level of physiological and physiological variables and the level of improvement of galactin-3 and the digital level of long-distance swimmers.

The researcher attributed these differences to the regularity of the control group in training without interruption and motivation and enthusiasm for performance,

As well as the preparation period and the preparation of this period of many exercises And the variety and general strengthening exercises as well as improving the level of physical performance, physiological and digital, which reflected the impact on the improvement of anaerobic capacity and the maximum consumption of oxygen and vital capacity in addition to the exercises in the skill of water, Physiological Gases.

This progress is also due to the role of the trainer and his influence in the training of swimmers and the codification of the training program suited to the age of the swimmers as well as the previous outcome of training for the research sample.

Thus, the second hypothesis of the research, which states that there are statistically significant differences between the averages of the preand remote measurements at the level of galactin-3, and some physiological and digital variables of the long-distance swimmers, the control group.

Table (5) shows statistically significant differences between the averages of the two dimensional measurements in the experimental and control groups at the level of some physiological, physical, digital and group variables 3 for long distance swimmers in favor of post . Significance (0.5)

The researcher considers the existence of statistically significant differences between the post-measurement averages of the experimental and control groups in all the variables under study to the effect of the endurance exercises of the different motor paths.

In designing the endurance exercises, the researcher took into account the accuracy and comprehensiveness of the training. Commensurate with the circumstances and potential training requirements for the research sample,

`Which led to a positive influence on all physiological and physical variables and digital level in question where the differences in the averages of the different measurements and the differences in Rate of improvement for the experimental group.

The researcher also refers to the improvement of heart function and the efficiency of the lungs in the transport of oxygen as a result of the use of endurance exercises, various motor paths, and those differences to the tendency of the research sample to change, innovation and creativity in the training and their motivation and high performance without interruption to achieve the highest levels of performance and this is achieved through training

The various tolerances and multi-track motor characterized by the ease and speed of performance and diversity of forms and the varying degrees of difficulty for swimmers and the simplicity and beauty of this type of training, which attracts many swimmers to perform, resulting in the continuity of improvement level

The researcher also points out the superiority of the experimental group in the digital level measurements that the endurance exercises led to the development or improvement of the physical aspects of the speed and speed control,

Which in turn reflected the improvement of physiological abilities such as the anaerobic capacity and the maximum consumption of oxygen and vital capacity and level (galactin-3) Positively affected the improvement of the digital level.

In this regard**, Sobhi al-Qulali** (2001) notes that the

level of performance is influenced by a combination of physiological and morphological factors, but physiological factors are at the forefront of these factors affecting the physical and thus the skill level. (5: 17)

The researcher also refers to these differences to the ease and effectiveness of the use of endurance exercises with different motor paths for many swimmers and provide the conditions that require performance during the competitions, which player often loves the new and useful in training and also tends to innovative performance and this enabled them to endurance exercises varied and multi-track kinetic.

The researcher also returns these differences due to the diversity and comprehensiveness of the exercises and linking them to all the skills and digital methods during the training and competitions. In addition, the researcher focuses on planning and implementing the training program to give greater priority to the development of digital performance in general.

Because endurance sports require increased heart muscle function for several hours, the heart is in an overloaded state, so it is clear that marathoners have an expansion of the right ventricle and atrium. They have an increase in serum troponin and sodium-producing peptides,

Later small pieces of fibrosis occur in the myocardium which are likely to lead to accelerated ventricular systems and sudden death. (9:18)

The differences between the two dimensions in the study variables (Galactin-3, Troponin I, the sodium biodegradable bacterium) are statistically significant differences and show a re-formation of the heart muscle due to pressure of some fibers, A clear predictor of myocardial infarction.

Thus, the third hypothesis of the research was achieved, which states that there are statistically significant differences between the mean of the two dimensional measurements in the experimental and control groups at the level of galactin-3 and some physiological, physical and digital variables

in the long-distance swimmers and for the experimental research group.

Conclusions

- ١Multi-track endurance exercises have improved the level of some physiological variables (anaerobic capacity - VO2max - dynamic capacity) of long-distance swimmers.
- ٢Multi-track endurance exercises have resulted in improvement in the level of 3-pro (BNP-troponin cTnI) in long-distance swimmers.
- ٣Multi-track endurance exercises have improved the level of the digital (800 m - 1500 m) long-distance swimmers.

Recommendations

- Use of the proposed program for multi-track endurance exercises because of its positive effect on the level of physiological and physiological variables, Galactin-3 and the digital level of long-distance swimmers.
- Training courses for trainers to raise awareness of the importance of multi-track endurance exercises for the development of physiological characteristics and physiological variables of swimmers.
- Conducting several studies on the importance of multi-track endurance exercises on other races.

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