The effect of resistance training using kettle bell and TRX With compound intake Beta-alanine on some respiratory and cardiovascular functions in long-distance athletes

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Introduction and research problem:

The sports community is witnessing a fierce race to obtain means that ensure the desired development with fewer side effects. It is not hidden from many of those working in the sports field the fatal damage of stimulants and the addiction they cause to their users. Therefore, many athletes have turned to searching for alternatives. Nutritional supplements are one of these alternatives that have gained great popularity because they are taken from natural food sources and work to provide a suitable environment for the growth of the body's muscles in addition to the nutritional program specific to the sports activity practiced. Nutritional supplements are considered one of the factors that help in raising the level of players' performance and thus lead to delaying the appearance of fatigue.

and It is mentioned Youssef Dahb Ali(2010 AD) Sports physiology is concerned with studying the functional changes that occur in the body as a result of performing physical training. Information from sports physiology can be used to develop the physical fitness and physical preparation of the athlete.8: 10)

As a result of the continuous development in the theories and concepts of training science, including: Attachment training aerotrain resistance training For the body using a tool Tyrwhitt includes body weight resistance. Which used to development Capabilities Physical and physiological, which affects Electrical stimulation of muscles, joints, flexibility and Balance ,and Its effectiveness A In helping to reach to Top notch.

and Athletics is one of the Competitions Which requires high physical fitness used by the runner to accomplish and achieve what he aspires to. What increases its difficulty and complexity is its multiplicity and the difference of its activities and the overlap of the physical characteristics of each activity. And it happened(1500mtr) One of them is characterized by the use of different energy systems in addition to the overlap of more than one physical characteristic and their participation in performance and is classified as Distances Running Medium with (800 mtr) to be in the middle of races Running Which gave the opportunity For contestants This distance to achieve an achievement in the races close to it in those qualities such as(Respiratory endurance, speed endurance, power endurance, speed-specific power).

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Amanda Komati (2014) and Victor Delicate (2013) agree thattool TRX is a tool or method designed for: Using body weight as controlled resistance on a muscle or group of muscles., Weymouth is used as a training tool to help develop muscle strength and flexibility .the General or develop muscle work towards motor performance similar to track and field competitions such as running, It can be used Alienor merge it With another training method in training to develop a physical component or skill performance.(4:9)(25:1)

Victor Delicate (2013) is known as tool TRX That it is Toto Attached tool training suspension Builds strength using body resistance using ropes and belts., As it does not have the flexibility and elasticity of a training stick .Rubber training rubber, elastic band It is also characterized by the stability and hardness of the manufactured material, such as regular rope. rope training ,And it can It is not done It will benefit you And By integrating it with other training devices or tools according to the scorer Differentializing programs.(25: 147)

Ronald Snare and Michael Ashiko agree. Ronal snarr, Michael Revco(2013 AD)On that tool TRX works to develop various health-related fitness elements such as strength. Muscular And flexibility to For joints and Increase the Stimulates sensory nerves and develops functional strength., And physical abilities related to skill performance such as balance, coordination and agility.(75:21)

Amanda and I agree .COMESA(2014 AD), Victor Delicate (2013) and It is a tool for hanging in which the body weight is used in addition to gravity, in accordance with the goal set for the special program, easily and safely. The term refers to TRX To Training resistance exercise, which means training using resistance, including body weight and gravity., and tool TRX Tilt will be used as a means of developing muscle balance between the upper and lower body extremities or Side of the body Withgoing addition to achieving balanced muscle development as a result of strength development .Muscular For extensor muscles and Holding The worker On any detailed, and also As an entry to prevent infection in advance. (4:9)(25: 144)

Amanda seacoast(2014 AD)) that it There are six main modes. By the angle of I Pillar On that The tool, Where resistance can be increased or decreased, Or by changing the method of capture. Move it delusion(standing facing , Opposite stand , Side stand of the pivot point, While on the ground you can face it. , noon , (sides).(19:8)

And he knows McGill et al. teal McGill(2014 AD)tootlers That it Isa hanging device in which body weight (by body position - angle) and gravity are used to increase the degree of difficulty by reducing the pressure with body weight or other external weights.(105:16)

McGill et al. (2014) agree, Amanda COMESA (2014), Victor Delicate (2013), Andrew Car bonier, Nini Aniston (2012) On the benefits of trinitrin has many benefits, including: Develop relative strength by using body weight as resistance on a set of

specific muscle and Muscular power ,Muscular endurance ,and Respiratory endurance, and Bear the disease, and Design similar exercises according to For Skill performance, and Improve aerobic and anaerobic fitness Yes ,and It helps in achieving any purpose due to the flexibility of movement. versatility For this Trainings These movements can be changed due to the ease or difficulty of performing them. As well as Lightweight, easy to carry and store than many other training equipment and tools., Reduces the time wasted in moving from one place to another to conduct the training process, It can perform an infinite number of exercises. It can be used with more than one training tool such as: kettle bell, and Swiss ball Swiss ball And Swiss base half swiss.(16:105-108) (6:9-15)(4:10)

and appeared kettle bellIn Russia in the early nineties audit will be used by Russian special forces for a long time. AND Infor meant spread to the rest of the world in different forms. According to the goal Training which is used for, and The killer but rather kettle bell, It is a metal tool in the shape of a ball. The jug is large in diameter at the base and gradually tapers towards the handle., It is used in many physical and skill training exercises.

Pavel Tatooine (2006) believes that the killer is…bell boxIt is an all-in-one tool., and Which works to develop the static strength by placing the body and lost Different, and its training can be regulated. About the way application Interval training method.(83:20)

Pavel Tatooine (2006) explains that The killer will be used. But rather bell box It has many benefits, including :Grow Yes Strength, endurance, agility and Body balance and aerobic capacity And anaerobic , and helps reduce the chances other harvest As a result of its use in improving muscle tone, and Used to develop balance .Muscular And the muscle strength of the different muscle groups, And it is used Develops better fitness than regular weights such as barbells, dumbbells and belts.(20: 44-49)

Pavel Tatooine (2006) believes that Available in different sizes from 1-46kg.There are many different shapes of the kettlebell. bell box One of them is that it is a single part designed in the shape of a jug with different weight categories, and this is the most common shape, and the other shape consists of the handle of the kettle. Bell boxIt is equipped with cylinders of different weights..(12:20)

As Samia Khalil (2008) points out, beta-alanine beta alanine It is considered one of the amino acids (non-essential), meaning that the body can produce it on its own. It is considered important in exercises, as the muscle reaches a stage of near-collapse during strenuous exercises, producing lactic acid. Beta-alanine helps reduce this acid during exercise, so it is considered very important in controlling muscle fatigue. (7:15)

Beta-alanine is known as a very important amino acid for bodybuilding, although it is considered non-essential according to the old school of nutrition. (15: 164)

Alanine is one of the amino acids that is broken down and released in large quantities during intense exercise. It is similar to glutamine in some ways, as it plays a role in cell enlargement. It helps provide a source of glucose so that it works to stabilize blood sugar levels. Fortunately, whey protein supplements contain relatively large amounts of alanine. If you are not using a supplement fortified with alanine, consider taking one that contains it, and take 2 grams of it daily immediately after exercise to get excellent results. (5: 165)

Studies have shown that taking beta-alanine as a nutritional supplement enhances muscle carnosine levels, which is the main factor in controlling fatigue, in addition to its role in stabilizing pH.ph) for the blood, which is the degree of acidity and alkalinity, and thus as an inhibitor and barrier to the expression of muscle acidity and limiting the formation of lactic acid. It also helps in increasing endurance. (87)

Beta alanine works When you train intensely your body produces hydrogen ions. The longer you train, the more hydrogen ions you produce and this reduces your level. The pH of your muscles. Muscles work best at a very specific pH level and when the pH drops below this level muscle performance begins to decline. Anything that helps avoid or delay this drop in pH will help delay muscle fatigue. This is where beta-alanine has proven to be helpful. Beta-alanine increases carnosine levels in thundersnow and fast muscle fibers and carnosine is a barrier that mainly absorbs hydrogen ions and thus reduces the chances of a decrease. By continually lowering hydrogen ion levels, Beta-alanine allows you to train harder and longer. Bottom line: Beta-alanine works by increasing hydrogen ions that contract your muscles.(90)

From the above, the importance of resistance training using bell box And the attachment tootlers In linking physical requirements and motor duties And use it to improve the work of many muscles. Which contributes to improving the level of performance compared to traditional training, as muscle strength in its various types helps in carrying out motor duties, which in turn affects the development of motor speed and its use to achieve high levels of digital achievement. And it happened(1500meter)one From the competitions that It depends on the aerobic system in energy production, which requires the efficiency of the respiratory system and the development of some elements of physical fitness to achieve a distinguished digital level. Since resistance training works to develop muscle strength, flexibility and speed, the researcher saw that implementing a training program using The effect of resistance training using Kettle bell and TRX with beta-alanine on some cardiovascular functions in long-distance athletes.

Research objective:

The research aims to identify the effect of resistance training using Kettle bell and TRX with beta-alanine on some cardiovascular functions in long-distance athletes This is done through:

1- impact Trainings Resistance using kettle ball and TRX on some Variables Jobs Functions of the respiratory system For contestants1500meter/It happened.

Research hypotheses:

1- There are statistically significant differences between the pre- and post-measurements at the level of some Functions of the respiratory system functions For 1500m/run competitors and for the benefit of the post-measurement of the experimental group.

2-There are statistically significant differences between the pre- and post-measurements in the level of some functions. Functions of the respiratory system functions have For contestants1500meter/The post-test was conducted in favor of the control group.

3-There are statistically significant differences between the dimensional measurements of the experimental group.AndAnd the officer in some Jobs Functions of the respiratory system functions have For contestants1500meter/The post-test was conducted in favor of the experimental group.

Some terms used in the research:

Capacity Vitality Inhalation (ivc) Inspiratory Vital Capacity

It is the maximum volume that can be inhaled after normal exhalation. It can be calculated by adding the stored inhalation volume to the normal breathing volume, which is estimated at 3.6, or it is the extent of the amount of inhaled air entering the lungs. (208:2)

rapid vital capacity:(FVC) Vital Capacity Forced

It is the maximum volume of air exhaled after the maximum inspiration at the maximum speed. It varies according to age, gender, body mass index and type of sports activity.. (1:369)

Maximum expiratory volume in the first second: (FEV1) In1 second Expiratory Volume Forced It is the maximum volume of air exhaled in the first second. After maximum inspiration. (10:423)

exhalation flow The farthest) peak expiratory flow

A test to measure the maximum speed of the maximum expiratory flow, and also shows the extent of improvement of the airways in individuals. (5:5)

flow exhale The farthest in25% from ability Vitality Forced

Maximal Expiratory Flow at 25 of Forced Vital Capacity (MEF25)

It is known as the size Maximum expiratory flow From 25%From ability Capacity Vitality The maximum. (177:19)

limit The farthest Relative For consumption Oxygen vo2max It is the maximum amount of oxygen consumed during aerobic work divided by body weight to determine oxygen consumption per kilogram of weight and is measured in units of (milliliters/kg/min)..(2:261)

identification Beta Alanine:

As Samia Khalil (2008) points out, beta-alanine beta alanine It is considered one of the amino acids (non-essential), meaning that the body can produce it on its own. It is

considered important in exercises, as the muscle reaches a stage of near-collapse during strenuous exercises, producing lactic acid. Beta-alanine helps reduce this acid during exercise, so it is very important in controlling muscle fatigue. (17:15)

Research plan and procedures:

Research methodology:

The researcher used the experimental method by designing two groups (an experimental group and a control group) in order to suit the nature of the research and achieve its objectives and hypotheses.

Research sample:

The research sample included (16)racer Under 20 years old and registered in the Saudi Amateur Athletics Federation, and They were selected intentionally. They were divided into two equal groups, each group consisting of (8) contestants.

Moderate distribution of the study sample:

Countries (1)

The normality of the distribution of the study sample values ingrowth variables n = 16

Variables	Unit of measure	Average	Standard deviation	twist
Age	year	19.08	0.08	0.61
height	centimeter	172.6	4.20	2.04
the weight	kilogram	67	2.7	-.160-
Body Mass Index	kg/m2	22.075	1.04	0.33
Training age	year	3.5	0.29	0.89

It is clear from Table (1) that the values of the skewness coefficient in the growth variables are between (-3,+3). This indicates the moderation of research values. Ingrowth variables.

Table (2)

The normality of the distribution of the study sample values in measuring some Jobs Lung And the pulse under consideration n = 16

Hide- - - -I saw	loneliness Measurement	Average	Standard deviation	twist
ivc inspiratory vital capacity	liter	4.11	0.021	0.31
FVC Forced Vital Capacity	liter	3.86	0.25	29.
FEV1 Forced expiratory volume in one second	liter	3.55	0.198	22.
Forced expiratory volume / forced vital capacity fev1/fvc	%	82.87	3.04	1.00
Forced expiratory volume in one second / Forced vital capacityfev1/vc	%	88	3.46	2.14-

Follow Table (2)
The normality of the distribution of the study sample values in measuring some Jobs Lung And the pulse under consideration n = 16

Hide- - - -I saw	loneliness Measurement	Average	Standard deviation	twist
Normal breathing volume(TV)	liter	11.41	0.05	-1.07
Expiratory volume saved(ERV)	liter	2.09	0.14	1.36
Pef Maximum expiratory flow	liter	6.41	0.301	1.90
Maximum pulmonary ventilation (MVV)	liter/meter	87.77	3.68	1.33
Pulse of comforter	pulse/minute	68.5	1.85	-.810-
maximum relative oxygen consumptionvo2max	ml/kg/h	48.44	5.84	-.14-

It is clear from Table (2) that the values of the skewness coefficient for the values of the physiological variables are between (-3, +3), and this indicates the moderation of the research values in the values of the physiological variables under study.

Table (3)
equivalent My group Study in growth variables1 = n2 =8

Tests	Unit of easure	Experimental group			The group The officer			Man Whitney	value z
		middle	Average Rank	total Ranks	middle	middle Ranks	total Ranks		
Age	year	19.07	9.0	72.0	19.05	8.00	64	28	463.0
height	poison	172	9.0	72.0	172.12	8.00	64	28	-0.248
the weight	kg	67	8.81	70.5	66.62	8.19	65.5	29.5	0.226
Body Mass Index	kg/m2	22.07	8.81	70.5	22,012	8.19	65.5	29.5	0.264
Training age	year	3.54	9.44	70.5	3.34	7.55	60.5	24.5	-0.801

value Man Whitney At 0.05 = 15 value Z At 0.05 = 1.96

It is clear from the table (3There were no statistically significant differences between the pre-measurements of the experimental and control groups in Growth variables Where was the value of Mann test And IT he calculated value is higher than its table value, as confirmed by the value Where it was less than its table value at 0.05.

Table (4)
equivalent My group Study in some Jobs Lung And the pulse1 n2 =8

Tests	Unit of measure	Experimental group			Control group			Man Whitney U	value z
		middle	Average Rank	total Ranks	middle	middle Ranks	total Ranks		
ivy inspiratory vital capacity	liter	4.11	11.1	89.5	4.036	5.81	46.5	10.5	-2.26
FVC Forced Vital Capacity	liter	3.90	8.56	68.5	3.85	8.44	67.5	31.5	-.053
FEV1 Forced expiratory volume in one second	liter	3.55	8.94	71.5	3.53	8.06	64.5	28.5	.369-

Follow Table (4)
equivalent My group Study in some Jobs Lung And the pulse1 n2 =8

Tests	Unit of measure	Experimental group			Control group			Man Whitney U	value z
		middle	Average Rank	total Ranks	middle	middle Ranks	total Ranks		
Forced expiratory volume / forced vital capacity fev1/fvc	liter	82.87	9.06	72.5	81.37	7.94	63.5	27.5	-484.
Forced expiratory volume in one second / Forced vital capacityfev1/vc	%	88	9.06	72.5	87.625	7.94	63.5	27.5	-.481
Expiratory volume saved ERV	%	2.10	9.13	73	2.09	7.88	63	27	-0.529
Peak expiratory flow (PEF)	liter	6.41	9.06	72.5	6.39	7.94	63.5	28.5	-.369-
Normal breathing volume TV	liter	11.43	8.56	68.50	11.42	8.44	67.50	31	0.053
Maximum pulmonary ventilation (VMV)	liter/meter	88.02	8.63	69	87.77	8.38	67	31	-0.105
Pulse of comforter	N/Q	68.5	9.31	74.5	67.87	7.69	61.5	24.5	-.684-
maximum relative oxygen consumptionvo2max	ml/kg/h	48.44	9.31	74.5	47.81	7.69	61.5	25.5	-.703-

value Man Whitney At 0.05 = 15 value At 0.05 = 1.96

It is clear from the table (4There were no statistically significant differences between the pre-measurements of the experimental and control groups in Physiological measurements Where was the value of Mann test And IT he calculated value is higher than its table value, as confirmed by the value Where it was less than its table value at 0.05.

Data collection tools and methods:

Firstly: Measuring tools and equipment used under consideration:

1- Restatement Length measurement in centimeters.

2- Medical scale to Weight measurement in kilograms.

3- Digital stopwatches One of a kind and works to the nearest 1/100 of.

4- Bowler watch.

5- Pulmonary function test. Spirostek (Attachment 1)

secondly: Reference survey method:

He did researcher By viewing A reference survey of scientific references and previous Arab and foreign studies specializing in sports training and sports physiology with the aim of: limit and specify The most important and A Relatives Tests Used in the research, in addition to that, the researcher conducted a reference survey to determine the tests to measure the physical and physiological variables to determine the tests Basic to measure research variables.

Proposed training program:

Program objective:

The training program aims to upgrade some Capabilities the Physical Special and respiratory system For the young1500m race/runder20 years.

Program development principles:

It will depend The researcher built the program on the following foundations:
* That the program achieves the objectives for which it was established.
* Considering the characteristics of the age group and individual differences among sample members.
* Pay attention to choosing the appropriate exercises.
* Developing the training program using scientific foundations related to the appropriate training load for the age group under20A year to avoid the phenomenon of overload and injuries.
* Continuity in training.
* The proposed program is flexible. .
* Consider the timing of physical measurements. And physiology.
Steps to design the training program:
-Through reference survey About the axes and periods of the proposed training program, and the following table explains that: Attached (3)
- Number of training units during Special physical preparation period=(10 weeks)
- Number of training units per week = 4 training units
- 4 units ×10 Weeks =40Training unit
- The daily training unit time is (90:120) minutes.
Average unit time = 90 + 120 = 210 ÷ 2 = 105 minutes
- Average training unit time = 105 minutes
- Training unit time during the program period =40Unit × 105 minutes =4200minute
-The total program time was divided into load levels according to the specified load cycle (1:2).
Medical dosage of the substance used:
The wrestlers in the experimental group took one capsule daily of the substance. Beta Alanine (500) mg, half an hour before the training session and after breakfast. The control group also took placebo tablets, which are identical in shape and external size to the tablets. Beta Alanine But it contains only inert carbohydrates, in order to avoid the psychological factor between the players for a continuous period of (8) weeks without interruption.
Practical procedures for the training program:
After reviewing previous studies and scientific references, the researcher reached some points through which the training program can be developed .and The researcher relied on applying resistance training using kettlebell and TRX on the AT:
− Always focus on the main stabilizing muscles (back – abdomen)
− The intensity is calculated by the maximum time the junior takes to remain still while performing the exercise.
− Focus on performance and spine alignment.
− Progress using light weights during the exercise.
− At the end of the training unit, stretching exercises are given to achieve relaxation with the aim of returning the muscles to their normal state.
Tribal measurements:
The researcher conducted pre-measurements of the research sample members in some lung functions and some physical measurements on 5/15/2023 at the New Damietta

Stadium and the Faculty of Physical Education Laboratory in Damietta.

Program application:

The program modules were applied to the experimental research groups. And the officer(16 contestants) It was implemented by assistants and under the supervision of the researcher, and the duration of the application was10 Weeks Four units per week starting From 16/5/2017 to 19/9/2023Thus, the number of training units for the program is (40) Training unit.

Dimensional measurements:

Dimensional measurements were performed in the same order as pre-measurements on 9/19/2023.

Statistical treatments used:

(arithmetic mean - standard deviation - skewness - correlation - Wilcoxon-Man and Tony-rate of change).

Presentation and discussion of results:

Firstly: Show the results of the first hypothesis which states: that it "There are statistically significant differences between the pre- and post-measurements in the level of some functions of the respiratory system. For the 1500m/run competitors, the post-test was for the experimental group.

Table (5)

Significance of differences between the two pre-measure mints And the next one For the group empiricism in Some lung and pulse functions are under investigation. n=8

Test name	Unit of measure	Measurement tribal	Measurement The dimension	Negative ranks		Positive ranks		value z	Factor Error	an average Change
				middle Ranks	total Ranks	middle Ranks	total Ranks			
ivc inspiratory vital capacity	liter	4.49	5.26	0.00	0.00	4.5	36	-2.52	0.01	17.14%
FVC Forced Vital Capacity	liter	4.04	5.97	0.00	0.00	4.5	36	-2.52	0.01	47.77%
FEV1 Forced expiratory volume in one second	liter	3.55	4.24	0.00	0.00	4.5	36	-2.52	0.01	19.43%
Forced expiratory volume / forced vital capacity fev1/fvc	liter	90	98.38	0.00	0.00	4.5	36	-2.53	0.01	9.31%
Forced expiratory volume in one second / Forced vital capacityfev1/vc	liter	82.88	95	0.00	0.00	4.5	36	-2.53	0.01	14.62%
Normal breathing volume TV	liter	11.43	12.34	0.00	0.00	4.5	36	-2.53	0.01	7.96%
Expiratory volume saved ERV	liter	2.10	2.72	0.00	0.00	4.5	36	-2.53	0.01	29.52%
Peak expiratory flow (PEF)	liter	6.42	7.27	1	1	5	35	-2.38	0.01	13.24%
Maximum pulmonary ventilation (VMV)	liter/meter	88.02	93.19	0.00	0.00	4.5	36	-2.53	0.01	5.87%
Pulse of comforter	pulse/minute	68.5	64.625	4	28	0.00	0.00	2.371	0.018	%5.66%
maximum relative oxygen consumptionvo2max	ml/kg/h	48.44	58.77	0.00	0.00	4.5	36	-2.52	0.01	21.33%

*Statistically significant at a significance level of 0.05 *value At 0.05 = 1.96

Table (5) shows that there are statistically significant differences between the pre- and post-measurements. For the group empiricism menthe Measurements Physiology In favor of the dimensional measurement, as the calculated error coefficient value was less than 0.05, as confirmed by the value overcalculated as it was higher than its table value at 0.05, except in the variable, fev1 fev1/fvc,fev1/vc Pef ,mef25,mef50.

secondly: an offer results The assumption the second that states on that There are statistically significant differences between the pre- and post-measurements in the level of some functions. Lung, pulse, some physical variables and level The digital for the 1500m/run runners is in favor of the post-measurement of the control group.

Table (6)

Significance of differences between the two pre-measurements And the next one For the group The efferosome Jobs Lung And the pulse n=8

Test name	Unit of measure	Measurement tribal	Measurement The dimension	Negative ranks		Positive ranks		value z	Factor Error	an average Change %
				middle Ranks	total Ranks	middle Ranks	total Ranks			
ivc inspiratory vital capacity	liter	4.44	4.78	1	1	5	35	2.38*	0.02	7.65%
FVC Forced Vital Capacity	liter	4.01	4.53	4	4	4.57	32	1.96*	0.05	12.96%
FEV1 Forced expiratory volume in one second	liter	3.47	3.92	0.00	0.00	4.50	36	2.52*	0.01	15.63%
Forced expiratory volume / forced vital capacity fev1/fvc	%	89.13	94.13	0.00	0.00	3.50	21	2.20*	0.03	5.61%
Forced expiratory volume in one second / Forced vital capacityfev1/vc	%	81.25	90.00	0.00	0.00	4.50	36	2.53*	0.01	10.77%
Peak expiratory flow (PEF)	liter	6.23	7.01	0.00	0.00	4.50	36	2.52*	0.01	12.52%
Expiratory volume saved ERV	liter	2.09	2.54	0.00	0.00	4.50	36	2.52*	0.01	21.53%
Normal breathing volume TV	liter	11.43	11.99	0.00	0.00	4.50	36	2.52*	0.01	4.89%
Maximum pulmonary ventilation (VMV)	liter/meter	87.77	91.06	0.00	0.00	4.50	36	2.52*	0.01	3.75%
Pulse of comforter	pulse/minute	68.5	66.75	4.38	17.5	1.75	3.5	1.476-	0.14	2.55%
maximum relative oxygen consumptionvo2max	ml/kg/h	48.44	53.02	3	3	4.71	33	2.1	0.036	9.45%

*Statistically significant at a significance level of 0.05 *value At 0.05 = 1.96

Table (6) shows that there are statistically significant differences between the pre- and post-measurements. For the group empiricism Where the calculated error coefficient value was less than 0.05, as confirmed by the value often calculated value was higher than its table value of 0.05.

Thirdly, presenting the results of the third hypothesis Which states: There are statistically significant differences between the dimensional measurements of the experimental group .And the officer in some jobs Lung and pulse in 1500m runners/run in favor of the post-measurement of the experimental group.

Table (7)
Significance of differences between the two measurements The distant ones For the group Experimental and control in Some functions Lung And the pulse
N1 = n2 =8

Tests	Unit of measure	Experimental group			The group The officer			Man Whitney	value z
		middle	Average Rank	total Ranks	middle	middle Ranks	total Ranks		
ivc inspiratory vital capacity	liter	5.26	12.50	100	4.78	4.50	36	0.00	-3.37*
FVC Forced Vital Capacity	liter	5.97	10.56	84.50	4.53	6.44	51.50	15.50	-1.74
FEV1 Forced expiratory volume in one second	liter	4.24	12.50	100	3.92	4.50	36	0.00	-3.39*
Forced expiratory volume / forced vital capacity fev1/fvc	%	98.38	12.50	100	94.13	4.50	36	0.00	-3.37*
Forced expiratory volume in one second / Forced vital capacityfev1/vc	%	95	12.50	100	90.00	4.50	36	0.00	-3.87*
Maximum pulmonary ventilation (VMV)	liter/meter	12.34	12.50	100	7.01	4.50	36	0.00	-3.37*
Normal breathing volumeTV	liter	2.72	12.50	100	2.54	4.50	36	0.00	-3.37*
Forced expiratory volume in one second / Forced vital capacityfev1/vc	liter	7.27	12.13	97	11.99	4.88	39	3	-3.10*
Expiratory volume saved ERV	liter	93.19	12.50	100	91.06	4.50	36	0.00	-3.37*
Pulse of comforthr	pulse/minute	64.625	6.19	49.5	66.75	10.81	86.5	13.5	2.004
maximum relative oxygen consumptionvo2max	ml/kg/h	58.772	11.56	92.50	53.02	5.44	43.50	7.50	-2.58

value Man Whitney At 0.05 = 15 value At 0.05 = 1.96 dal*

It is clear from the table (7) The presence of statistically significant differences Significance of differences between the two measurements The distant ones For the group Experimental and control in Variables Jobs Lung and in favor of the post-measurement of the experimental group Where was the value of Mann test And Calculatedness From its tabular value as confirmed by the values where and She was higher From its table value at 0.05Except in tests fecund max hr. Andhra Where was the value of Mann test And Calculated ghee From its tabular value as confirmed by the values where it Wasserstrom its table value at 0.05.

Discussion of results:

states The first assumption on that it There are statistically significant differences between the pre- and post-

measurements in the level of some functions. Lung, pulse, some special physical variables and level Digital For 1500m/run competitors and for the benefit of the post-measurement of the experimental group.

To verify the hypothesis, the researcher compared the results of the two measurements'- and post-test of 1500m racers/run experimental research sample And Table No. (7) and Figure No. (1) show that there are statistically significant differences at the significance level of 0.05 between the pre- and post-measurements of the experimental group.

It is attributed researcher Cause of occurrence improvement in Variables Physiology That Trainings Using Resistors TRX, kettlebell Which is performed at high intensities according to the conditions of muscle and skill work similar to the 1500m juniors/run at a time. Positively impacted the increase Lung function, maximum oxygen consumption, and resting heart rate Under investigation as an external indicator that falls on the device Respiratory and circulatory Which changed its biology, leading toto profiling function under investigation, maximum oxygen consumption and resting heart rate, as a result continue in effort Physical All the time Performance.

This is consistent with what I mentioned .Mohammed Samir Saad El-Din(2000 AD) The training program led to the development of the muscles working between the reasserts muscles diaphragm muscle Diagram Which led to the improvement of lung function under investigation.(20:5)
Regular training also led to improved performance of the circulatory and respiratory systems and increased muscle endurance, which led to increased ability to consume oxygen..

As it confirms Youssef Dahab (2010) To accomplish Sports training processes appear in the relationship and compatibility between the timing and intensity of training on the one hand and individual characteristics on the other. Physical and physiological For the contestant On the other hand, therefore, attention must be paid With physiological and physical characteristics For the player.(13:7)

He adds, McGill" (2014)When directing intensive training loads, the trainer must first determine Physical and physiological characteristics For the contestant Then, after regulating the training loads, he distributes the training units..(109:14)

It is clear from Table No. (8) and Figure No. (2) that there are statistically significant differences at the significance level of 0.05 between the pre- and post-measurements of the experimental group in the specific physical variables under study.
And Condolences researcher This improvement in level Variables Physical For contestants To the nature of the program and what it contains of physical exercises using Resistors

TRX, kettlebell fit For its capabilities and their abilities and standardized load and directed to the development of these physical elements.

Victor Delicate (2013) points out that physical preparation using the attachment tortrix has a clear effect on developing physical and motor abilities such as muscle strength, endurance, speed, agility, flexibility and their components such as speed-related strength and strength endurance (24:3). Pavel Testation (2006) points out that: kettlebell It is used to develop many physical variables, including strength endurance, speed endurance, coordination, and flexibility. (43:24)

As he sees Scott Jennes (2003)It is necessary to specify Physical variables For the contestant It helps in scientific planning of physical preparation programs, which must coincide with the timing of the athletes' performance of these programs in order to achieve the greatest possible benefit to produce Reserve The contestantlatent.21:214)
The results of this study agree with the study of both in that the improvement of the physiological and physical aspects of players is directly proportional to the improvement of the digital level. Mohammed Sanaa Abdel Majeed (2015) (4)Nick Peltz et al. (2013) (18) Study Comat is lying and others(2013 AD) (14) study What is my country and others? (17), Muhammad Boubacar (2016 AD) (2) .

This confirms the validity of the first hypothesis, which states that: that it There are statistically significant differences between the pre- and post-measurements in the level of some physical variables and functions. Lung And the level Digital For the 1500m/run competitors, the post-measurement was for the experimental group.

Secondly, discuss the second hypothesis, which states: There are statistically significant differences between the pre- and post-measurements in the level of some functions. Lung And the pulse And some Variables Physical Private And the level Digital I have For contestants1500meter/The post-test was conducted in favor of the control group.

To verify the hypothesis, the researcher compared the results of the two measurements. NPre- and post-race of 1500m racers/run research sample The officer It is clear from Table No. (9)(10) And the form Number (3)(4) There were statistically significant differences at the significance level of 0.05 between the pre- and post-measurements of some lung functions, pulse, and specific physical variables of the group. The officer.

And Condolences researcher This improvement in the level of physical fitness elements for juniors is due to the nature of the program and the appropriate physical training it

contains. For its capabilities and their abilities and standardized load and directed to the development of these physical elements.

The researcher believes that the superiority of the post-measurement over the pre-measurement for the control group is due to the effect of the program applied to the control group, which included general physical exercises.

The researcher attributes the improvement in the level of the physiological and physical characteristics under study to the fact that the program followed, which included “physical” exercises, led to an increase in the level of some of the aforementioned physiological fitness and physical variables.

The researcher also attributes this progress to the efficiency of the members of the control group, as regularity and continuity in practice, in addition to the continuous competition between the players and providing the best physical performance, had a significant impact in raising the level of some physical and biochemical qualities, and thus improving the level of skill performance.

This confirms the validity of The assumption The second, which states: There are statistically significant differences between the pre- and post-measurements in the level of some functions. Lung And the pulse And some Variables Physical Private And the level Digital I have For contestants1500meter/The post-test was conducted in favor of the control group.

Thirdly, discussion The third assumption Which states that There are statistically significant differences between the dimensional measurements of the experimental group. And the officer in some Jobs Lung And the pulse And some Variables Physical Private And the level Digital I have For contestants1500meter/The post-test was conducted in favor of the experimental group."

It is also clear from the table number (11) (12) And the graphic form No. (5) (6) There were statistically significant differences at a significance level of 0.05 between the control and experimental groups in the post-measurement of all strength tests characterized by speed. Endurance, strength, speed, flexibility and digital level In favor of the post-measurement of the experimental group as shown in the table(11) (12) The experimental group outperformed the control group in terms of and rate of change For all Pulmonary function and pulse variables are also under investigation. Speed strength tests Speed strength tests Endurance, strength, speed, flexibility and digital level.

The researcher attributes the superiority of the experimental group over the control group in these tests to the effect of the training program. With resistances kettlebell, TRX During

which the load was directed towards Many specific physical variables are under investigation. In addition to the unified skill program applied to the experimental and control groups..

The researcher also attributes the high results of the experimental group in the strength tests characterized by speed. Endurance, strength, speed, flexibility, compatibility, and digital level. Gained from the application of the training program With resistances kettlebell, Troths is consistent with what was indicated by the study. Tamer Abdel Moneim (2008) (2), Michelle (2004) (16), Dave Schmitz (2003) (11), Jeffrey Jannott et al. (2013) (14), Scott Genies 2003 (21), Steve Cotter (2013) (22), Tiana Weiss et al. (2013) (23), Kristen Jannott et al. (2013) The training program directed at developing strength characterized by speed had a significant effect on the dimensional measurements. For that A For tests.

Where it indicates Ahmed Samir (2016)Maximum oxygen consumption is the best physiological indicator of an individual's functional potential and a good indicator of his physical fitness. Maximum oxygen consumption represents the body's maximum ability to take in and transport oxygen. Then extract it from the working cells (muscles). (1:91)

And he mentions Muhammad Nasr al-Din Radwan 1998 AD The circulatory system, the respiratory system, and the muscular system are the determinants of maximum oxygen consumption. If the respiratory system supplies the circulatory system with larger quantities of oxygen to transport to the muscles, the muscles cannot consume the oxygen supplied to them by the circulatory system, even in the case of high-intensity performance. Therefore, the muscles are the determining factor (the arbiter) of aerobic capacity, not the respiratory and circulatory systems. (6:174)

Therefore, the researcher attributes the superiority of the post-measurement over the pre-measurement for the experimental group in the variable of maximum oxygen consumption and in the lung functions under study to the effect of the program. Training With resistances kettlebell, TRX.

The researcher attributes this to the fact that the impact of the proposed and scientifically planned training program has led to improved performance. For 1500m racers/run Thus improving the level of specific physical and physiological variables. I have Experimental research group This is a result of the training. For resistors which influenced and improved performance Digital level.

Thus, the validity of the third hypothesis is confirmed. Which stated that there are statistically significant differences between the dimensional measurements of the experimental group. And the officer in some Jobs Lung And the pulse And some

Variables Physical Private And the level Digital I have For contestants1500meter/The post-test was conducted in favor of the experimental group..

Conclusions:

From the above, and within the limits of the research sample, the methodology used, the research objectives, and the analysis of its results, it was possible to: For researchers Reach the following conclusions:

-The training program applied to the experimental group led to:

1. There are statistically significant differences between the two measurements'- and post-operative measurements of some physiological variables of lung function-Pulse rate For 1500m racers/run.
2. There are statistically significant differences. Between the two measurements- and post-level of some physical variables Speed - Muscular endurance - Agility-flexibility-muscular strength-muscular power-speed endurance among 1500m juniors in favor of the post-measurement of the experimental group.
3. There are statistically significant differences between the two measurements'- and post-digital level For 1500m racers/run.

Recommendations:

in The objectives, research community and selected sample were discussed, and in light of the research results, it is presented. The researchers The following recommendations:

1- Implementing the training program for training at the junior sector level in the 1500m/run race.

2-Taking into account the proper time distribution for training young players according to For their physiological abilities.

3- Training and refining trainers in charge of young age groups in the art of designing and setting
appropriate exercises Possibility and capabilities Juniors.

2-Trainers awareness The importance of using resistance training using (trx, kettlebell) Because it plays a role in developing special physical abilities, many lung functions, and the digital level of the 1500-meter race.

3- Conduct similar studies on different categories and Age stages Different.

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