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The effect of (Tabata) exercises using resistances on some health and motor fitness components

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Abstract

The importance of the research lies in the preparation of (TABATA) exercises using resistances in some functional and morphological variables and the physical fitness of the trainees in fitness centers for the purpose of improving the level of fitness elements and burning calories among the trainees. The differences between the pre and posttests in the researched variables of the control and experimental groups and to identify the differences between the post tests in the researched variables of the experimental and control research groups, the researchers used the experimental approach as it fits the nature of the research problem to be solved, the research community was determined by the intentional method of the trainees participating in the hall Athlete kickboxing Bawah Nour ages (39,30 years), and their number is (30) trainees, and (14) of them were selected as a sample for research, with a percentage of (46) from the total community, and they were randomly divided into two groups, experimental and control, and each group consists of (7) trainees, the training curriculum consists of two intermediate courses, each intermediate course contains (3) small (weekly) training sessions, and the number of units The weekly training days were (3) units and for a period of (6) weeks, i.e. (18) training units. The load fluctuation for each week was (1-2) meaning that the change was in size with constant intensity and comfort. The number of exercises in the training program consisted of (42) exercises. Each training unit included (8) exercises, and the researchers reached the following conclusions: The Tabata exercises have a positive effect in raising the level of some functional, morphological and physical fitness variables in the experimental group - it did not show a significant effect for some of the studied variables measuring the abdominal circumference at the level of the navel -Measurement of thigh circumference measured body weight in the tests distance between the control and experimental groups. and this achieves one of the sustainable development goals of the United Nations in Iraq which is (Good Health).

Keywords

TABATA, functional variables, fitness morphology

Introduction

Any real development of the level of the individual athlete can only be achieved through continuity and proper reliance on the process of sports training, as it is one of the most important topics dealt with in the sports field due to the prominent and important role it possesses in developing the physical, skill, health and social aspects of the individual athlete, which is one of

the effective sports sciences which contributed greatly to achieving good sports results and a high level of sports achievement in sports competitions, by relying on the theories, principles and scientific foundations of the sports training process and based on other sports sciences. , which always gives superiority to the individual athlete to perform all motor duties in

the best possible way as well as giving an aesthetic and streamlined movement to the required, and thus reaching advanced levels of motor performance, and the science of sports training is defined as "the theories, rules, procedures and methods used to improve the player's level, which are mainly related to the process organized and planned" (20).

And that any default against these qualities in the training process negatively affects the level of the individual athlete and thus the low levels of performance of the individual athlete.

Therefore, workers in the sports field must use different training methods and methods that are established according to sound and advanced scientific foundations. Among the modern and effective training methods in physical fitness training is the Tabata method, where high-intensity exercises are performed repeatedly and with a short performance time (20) seconds with taking short periods of time to rest for a period of 10 seconds, where one group ends, and these exercises consist of 8 groups in a time of 4 minutes, so that the body of the individual athlete becomes more efficient in using energy, so in recent years, coaches have given great importance and sufficient time for (Tabata) exercises which has proven its role and effectiveness in burning fat, improving the functioning of the cardiovascular system, and raising the level of physical fitness, especially endurance.

Resistance training is one of the effective exercises to improve muscle strength and health, increase muscle endurance, and reduce the loss of muscle fibers by building muscles, which includes weight training, rubber ropes, medical balls, and other various exercises, which confirms the importance of these exercises, which have a positive effect on progressing at the physical level. and occupation of the sample. And those exercises that are widely used, especially in fitness halls, increase physical fitness and improve functional devices (5).

Hence the importance of the research in the preparation of (Tabata) exercises using resistances in some functional and morphological variables and physical fitness of the trainees in the fitness centers for the purpose of improving the level of the elements of physical fitness as it constitutes a basic base and one of the most important requirements for calorie consumption and fat burning for the trainees. Through the modest experience of the researchers and the field observation in the field of health centers and sports halls for body building and weight loss, the researchers noticed that the training of the female players is random and not based on the scientific basis of the methods and training methods used, as well as the failure to apply the appropriate exercise in an optimal manner based on studied academic foundations which works to burn more calories, which increases the possibility of exposure of these players to some health risks and sports injuries, The functional, morphological and physical fitness of the trainees in the fitness centers in a modest contribution by the researchers in order to raise the level of the trainees physically towards better levels according to the appropriate scientific solutions. The research aims to prepare (Tabata) exercises using the resistances of the research sample.

- Identifying the differences between the pre and post-tests in the variables studied in the control and experimental groups.
- Identifying the differences between the post-tests in the researched variables of the control and experimental research groups.

Research assumes:

- There are statistically significant differences in the researched variables between the results of the pre and post-tests of the control group.
- There are significant differences in the researched variables between the pre and post-tests of the experimental group and in favor of the post tests.

- There are statistically significant differences in the researched variables between the results of the post-tests for the two groups (the experimental control).

Research areas:

1. The human field: a sample of female trainees participating in fitness and weight loss courses.
2. Time range: for the period from 5/8/2022 AD to 2/20/2023 AD.
3. The spatial field: the hall (Bawah Noor Cake Boxing) in Bibaz district

Research methodology and field procedures

Research methodology

The researchers used the experimental approach because it fits the nature of the research problem to be solved, as it plays “the appropriate approach is one of the most important steps that result in the success of the research, as the approach depends on the problem and the goal to

be achieved” (19), or it is “an attempt to control all the main influencing factors.” In the dependent variable or variables” (24)

Method and procedures:

The research population was determined by the intentional method of the trainees participating in the gym (Kickboxing Bawa Noor) at the ages of (30-39 years), and they were (30) trainees, and (14) of them were selected as a sample for research, with a percentage of (46%) of the total society and they were divided randomly into two groups, experimental and control, and each group consisted of (7) trainees, and the processes of homogeneity and equivalence between the two groups were carried out according to the variables that were adopted in the research, and tables (1) (2) show this

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

.Seq	Statistics Variables	unit of measurement	arithmetic mean	median	deviation	skewness
1	Length	Meter	1.62	0.06	1.61	0.13
2	Mass	.Kgh	77.35	8.48	74.00	1.33
3	Age	Year	34.62	3.34	35.00	0.14

The table (1) shows the values of torsion less than +-3 for all variables, which indicates the homogeneity of the research sample members in the variables length, mass, age and training age.

Table (2)

Shows the statistical parameters of the equivalence of the researched variables for the two research groups

.Seq	Measurements and tests	Unit of measurement	Control group		Experimental group		Calculate d T	significance Level	differences
			A	STD	A	STD			
1	Measure heart rate after exertion	stroke/m in	159.00	10.42	164.57	7.72	1.13	0.27	Un sign
2	Measure the number of respirations after exertion	times/minute	44.28	4.46	43.71	4.75	0.23	0.82	Un sign
3	Measure the circumference of the upper arm	Cm.	38.14	3.97	37.28	4.53	0.37	0.71	Un sign

4	Measure the abdominal circumference at the navel level	Cm.	108.85	10.31	107.14	8.35	0.34	0.73	Un sign
5	Measure the circumference of the thigh	Cm.	62.71	6.01	61.14	5.14	0.52	0.60	Un sign
6	Measure body weight	kg.	78.14	9.17	76.57	8.38	0.33	0.74	Un sign
7	Run (150) m shuttle	second	103.57	10.35	104.71	8.65	0.22	0.82	Un sign
8	Sitting up from lying down on your back	repetition	26.85	4.37	25.28	5.37	0.60	0.56	Un sign
9	Front lean: bend and extend the arms for 60 seconds	repetition	18.28	1.60	20.00	2.16	1.68	0.11	Un sign
10	Half squat jump	repetition	19.00	5.00	17.57	4.11	0.58	0.57	Un sign

Table (2) showed that the difference was not significant between the members of the two research groups in the variables studied, and this indicates the equivalence of the two research groups at the level of significance (0.05).

Tools and devices used and data collection methods

Devices and tools used:

Electronic calculator (hp), stopwatch (Casio), number (1), medical scale, type Sony, number (1), medicine balls weighing (1,2,3) kg, (10) balls, and a 50-meter linen tape measure (1), training ladder number (3), heavy ropes (4), iron bar (5), discs (weights), dumbbells of various weights, multigame machine, Swedish bench (5), fitness bike, hammer and tires number (2).

Data collection methods

Questionnaire form, Arabic sources and references, the international information network, tests and standards, opinion of experts and specialists, the support team.

Measurements and tests used in the research:

Functional measurements:

1- Measuring the heart rate after exertion (17)

The heart rate was measured indirectly from the carotid artery in the neck, pressing gently on the area between the left side of the trachea (parallel to the larynx) and between the front of the

sternocleidomastoid muscle, with the three fingers - the ring finger, the middle, and the index finger - then moving the fingers until the feeling the pulse of the cervical carotid artery, and counting the number of heartbeats during (10 seconds), then multiplying the result by 6.

2- Measuring the number of respirations after exertion.

The number of breathing times for the subject was measured immediately after the effort, as “the one who performs the measurement process counts the number of times the chest rises (inhaling) within one minute” (4), taking into account the suggestion to the subject that the measurement is not for the purpose of calculating the number of breathing times for Obtaining accurate and uncontrolled results by the examinee.

Morphological measurements:

1- Measurement of the upper arm circumference (25)

Instructions: Wrap the measuring tape at the upper arm midway between the shoulder and the elbow.

Registration: Recording is done to the nearest (mm).

2- Measuring the circumference of the abdomen at the level of the navel (15)

The tape is placed horizontally around the abdomen and at the level of the navel and the reading is taken.

3- Thigh circumference measurement (15)

A measuring tape is wrapped around the area from below the gluteal fold and in front of the highest level of the quadriceps muscle.

4- Measuring body weight (12)

The body weight was measured by means of a sensitive medical scale to the nearest (0.5 kg). The laboratory stands in the middle of the base of the scale so that the body weight is distributed on the feet.

Physical exams:

1- Running (150) m shuttle (8).

2- The sitting test from lying down from the supine position on the back (15).

3- Forward support test, flexion and extension of the arms during 60 seconds (14).

4- The half-squat jump test (16).

Exploratory experiments:

The exploratory experiment is "a similar and mini experiment to the main experiment". The researchers conducted the first exploratory experiment of physical tests on a research sample consisting of (3) individuals, and the second exploratory experiment of the training curriculum for a model from the training unit on (3) other individuals from the research sample on (14-17/8/2022) The purpose of the exploratory experiments is as follows:

Ensure that the training time is implemented on time.

Determine stressed exercises.

Ensure the time taken for each test.

Identify the physical and functional level of the sample.

Ensure the validity of the tools and devices used in the application of the exercises.

Identify the obstacles and negatives that appear during the implementation of the experiment.

Knowing the validity of the tests for the level of the sample.

Field research procedures:

Pre-tests

The researchers, along with the assistant work team, conducted pre-tests for the researched variables, and they were as follows:

1- On (Sunday) on (28/8/2022), a speed endurance test, functional and morphological measurements were carried out.

2- On (Monday) on (8/29/2022), physical exams were carried out.

Application exercises

(Tabata) exercises were implemented on the experimental group on (4/9/2022) until (10/13/2022), and the researcher relied in designing (MetCon) exercises on some scientific training sources and academic research for the purpose of ensuring the validity and readiness of the exercises and the number of units training (Annex 1), and benefiting from some scientific and academic sources and the observations of gentlemen (experts and specialists in the field of sports training science and sports training physiology) (Annex 2).

When starting to apply the exercises, the researchers took into account the following points:

- The training method (Tabata) was relied upon to develop the research variables.

- The training curriculum consists of two intermediate courses; each intermediate course contains (3) small (weekly) training courses.

- Number of weekly training units (3) units for a period of (6) weeks, i.e. (18) training units.

The intensity ranged between (70% - 75%) for strength endurance training and (75% - 80%) for speed endurance training.

- Pregnancy fluctuation for each week was (1-2), meaning that the change was in size (groups), with constant intensity and rest.

- The training program consisted of (42) exercises, and each training unit included (8) exercises.

- Include resistance exercises (weights, rubber ropes, additional weights, fitness bikes with handles or poles, combat ropes)

The time for performing one exercise is (20) seconds.

Rest between exercises (10) seconds and between sets (3-3.5) minutes.

- Every week, the exercises are changed using new exercises, while maintaining the goal of the exercise and the participating muscle group.

- The control group relied on the training program followed by the trainer, which includes weight training, walking and other exercises.

Post-tests:

After completing the application of the exercises, the post-tests were conducted on (15-16/10/2022), and the researchers were keen to provide the same conditions in which the pre-tests were conducted.

Statistical means:

The researcher used the statistical program (SPSS) to extract the following: skewness coefficient, median, arithmetic mean, standard deviation, t-test for related samples, t-test for unrelated samples.

Results

Presentation, analysis and discussion of the results

Presenting, analyzing and discussing the results of the researched variables.

Presentation of the results of pre and post tests for the control group

Table (3)

the statistical parameters of the pre and post-tests of the variables studied in the control group

.Seq	Measurements and tests	Unit of measurement	Control group		Experimental group		Calculate d T	significance Level	differences
			A	STD	A	STD			
1	Measuring heart rate after exertion	stroke/min	159.00	10.42	161.42	8.28	2.43	0.051	Unsign
2	Measure the number of respirations after exertion	times/m inute	44.28	4.46	42.57	3.73	3.61	0.01	Sign
3	Measure the circumference of the upper arm	poison	38.14	3.97	37.85	3.67	1.54	0.17	Unsign
4	Measure the abdominal circumference at the navel level	poison	108.85	10.31	107.00	9.91	3.65	0.01	Sign
5	Measure the circumference of the thigh	poison	62.71	6.01	62.28	5.90	2.12	0.07	Unsign
6	Measure body weight	kg	78.14	9.17	76.57	8.30	2.56	0.04	Sign
7	Run (150) m shuttle	second	103.57	10.35	101.28	8.82	3.36	0.01	Sign
8	Sitting up from lying down on your back	repetition	26.85	4.37	30.28	4.27	4.22	0.00	Sign

9	Front lean: bend and extend the arms for 60 seconds	repetition	18.28	1.60	21.42	2.57	5.28	0.00	Sign
10	Half squat jump	repetition	19.00	5.00	20.71	5.15	6.00	0.00	Sign

Significant at a level of significance less than (0.05)

Displaying the results of the pre and post-tests of the experimental group

Table (4)

the statistical parameters of the pre and post-tests of the researched variables of the experimental group

.Seq	Measurements and tests	Unit of measurement	Control group		Experimental group		Calculate d T	significance Level	differences
			A	STD	A	STD			
1	Measuring heart rate after exertion	stroke/min	164.57	7.72	172.14	5.01	3.76	0.00	Sign
2	Measure the number of respirations after exertion	times/minute	43.71	4.75	38.57	2.63	3.90	0.00	Sign
3	Measure the circumference of the upper arm	Cm.	37.28	4.53	33.57	3.40	7.12	0.00	Sign
4	Measure the abdominal circumference at the navel level	Cm.	107.14	8.35	100.28	6.67	7.75	0.00	Sign
5	Measure the circumference of the thigh	Cm.	61.14	5.14	60.00	5.03	4.38	0.00	Sign
6	Measure body weight	kg	76.57	8.38	74.00	7.63	2.46	0.4	Sign
7	Run (150) m shuttle	second	104.71	8.65	92.00	6.48	3.04	0.02	Sign
8	Sitting-lying test	repetition	25.28	5.37	35.85	4.63	10.87	0.00	Sign
9	Frontal support test: bend and extend the arms within 60 seconds	repetition	20.00	2.16	27.28	2.13	12.88	0.00	Sign
10	Half-squat jump test	repetition	17.57	4.11	26.71	4.95	15.37	0.00	Sign

Significant at a level of significance less than (0.05)

Presentation of posttest results for the control and experimental groups

Table (5)
the statistical parameters of the post-test of the researched variables in the control and experimental groups

.Seq	Measurements and tests	Unit of measurement	Control group		Experimental group		Calculate d T	significance Level	differences
			A	STD	A	STD			
1	Measuring heart rate after exertion	stroke/min	161.42	8.28	172.14	5.01	2.92	0.01	Sign
2	Measure the number of respirations after exertion	times/minute	42.57	3.73	38.57	2.63	2.31	0.03	Sign
3	Measure the circumference of the upper arm	poison	37.85	3.67	33.57	3.40	2.26	0.04	Sign
4	Measure the abdominal circumference at the navel level	poison	107.00	9.91	100.28	6.67	1.48	0.16	Unsign
5	Measure the circumference of the thigh	poison	62.28	5.90	60.00	5.03	0.77	0.45	Unsign
6	Measure body weight	kg	76.57	8.30	74.00	7.63	0.60	0.55	Unsign
7	Run (150) m shuttle	second	101.28	8.82	92.00	6.48	2.24	0.04	Sign
8	Sitting up from lying down on your back	repetition	30.28	4.27	35.85	4.63	2.33	0.03	Sign
9	Front lean: bend and extend the arms for 60 seconds	repetition	21.42	2.57	27.28	2.13	4.63	0.00	Sign
10	Half squat jump	repetition	20.71	5.15	26.71	4.95	2.22	0.04	Sign

Significant at a level of significance less than (0.05)

Results and discussion

It is clear from Table (3) that there are significant differences between the pre- and post-tests and in favor of the post-tests of the control group in some of the variables investigated (measuring the number of breathing times after exertion, measuring body weight, shuttle running test (7 x 20) meters, sitting-up test from the prone position on the back, the forward lean test, bending and extending the arms within 60 seconds, and the half-squat jump

test). The researchers believe that continuous and ongoing training according to field plans has a positive impact on developing some of the variables investigated in the control group, and that developing the level of physical fitness elements is the basis. Which the trainees rely on to achieve the training goal and achievement and increase the individuals' ability to optimally perform physical exercises, and thus better functional capabilities and burning more calories. However, when comparing the results

of the post-arithmetic calculations for the control and experimental groups, we see that there is a clear superiority for the experimental group in the results of the variables investigated.

From Table (4), it is clear that there are significant differences between the results of the pre- and post-tests of the experimental group in the variables investigated, and with regard to the functional variables (measuring the heart rate after exertion, measuring the number of breathing times after exertion). The researchers noted that there were significant differences in favor of the experimental group. The researchers attribute this to the fact that the high-intensity exercise in the Tabata style led to more improved adaptations in the organs and tissues of the respiratory circulatory system, and thus an improvement in the elasticity of the lung tissues and an increase in the rate and depth of respiratory ventilation in order to Producing the necessary energy in muscle cells, and due to the increase in heart rate during high-intensity physical effort, there is an increase in the volume of blood pushed from the heart through the blood vessels to the body's organs to meet the body's need for the required oxygen, and this is consistent with what (Haider Mahdi, 2009) mentioned about (Qasim Hassan) noted, "Practicing sports training regularly leads to positive functional changes in the respiratory system, and these changes achieve additional flexibility in the muscles of the rib cage, which increases their ability to expand and expand, which leads to an increase in the volume of inhaled air and thus helps to increase the amount of oxygen." In the process of gas exchange between the blood and the alveoli and the economy of breathing movement due to the increase in vital capacity" (7), it is worth noting that the respiratory system "plays a decisive role in implementing various functions during muscular effort and is responsible for providing oxygen to various tissues and cells of the body." Including muscle cells" (21), and (Adel Idan, 2007) pointed out from (Al-Takriti and

Muhammad Ali) that "sports training leads to an increase in the amount of air entering and leaving the lungs in the processes of inhalation and exhalation" (13). The increase in the pulse rate after exertion among the sample members agrees with what was stated by the researcher (Ammar Hamza) that the adaptation occurring in the functional systems as a result of the adaptation led to an increase in the pulse rate to meet the muscles' need for energy" (14). (Al-Sheikhly et al., 2020) adds that "regular training leads to physiological changes in all the functions of the players' body systems, especially the functions of the heart and circulatory system. Well-trained people can adapt to the functional changes that occur in the body's systems as a result of muscular effort and continue to perform this effort. Among these are The changes include an increase in the number of heartbeats and an increase in the number of breathing times" (23). The study (Lamia and Widad) confirmed "the necessity of using various and purposeful exercises related to physical fitness and motor compatibility in order to maintain the health of the body, as well as practicing activities in a natural way, and the necessity of paying attention to conducting periodic tests related to physical fitness and motor compatibility in order to know the level of fitness and compatibility" (22)

As for the tests (running (150) m shuttle, sitting from lying down on the back, forward leaning, bending and extending the arms within 60 seconds, jumping half-squat) that measure the level of some elements of physical fitness, the researchers noted the presence of significant differences in favor of the experimental group, and they attribute The researchers developed this development into the nature of the Tabata-style training program, which was prepared as a basis for developing the individual athlete's level of physical fitness, which affected all the training characteristics of these researched characteristics in terms of training intensity, repetitions, and exercise durations, as it included physical

exercises with high intensity, short rest, and using resistance. Which had a clear effect in improving the physical level of the sample, and this is confirmed by (Hussam, 2016) that “exercises performed with excessive repetitions and short periods of rest lead to an effect, at best, on increasing strength extension” (6), and in this In this regard, (Muhammad and Ihab, 2008) mention that strength endurance is “the ability to make a continuous effort of great strength” (26), and this opinion is reinforced by what (Saeed Alwan, 2011) confirmed about (Issam and Muhammad) that “If I want to increase muscular strength The muscles must contract against great resistance, and this is done in the following ways. There must be special exercises against the body’s weight before tightening the muscle, and also exercises with high resistance against external motor resistance, such as training with weights. This method increases strength because the resistance here can be increased. Gradually” (11), and regarding the characteristic of speed endurance, (Ahmed Shaker, 2006) indicates, “When training specific speed endurance, we must take into account the increase in the number of repetitions, in addition to that, an increase in the degree of load intensity” (2), and it is promised that “ The ability to continue performing symmetrical and asymmetrical movements and repeat them efficiently and effectively for long periods at high speed without a decrease in the level of performance efficiency” (1).

With regard to the morphological measurements (measuring the circumference of the upper arm, measuring the circumference of the abdomen at the level of the navel, measuring the circumference of the thigh, measuring the body weight) it is noted that there are significant differences in favor of the post-tests, and the researchers attribute the reason for the significant differences in these variables to the use of (Tabata) exercises, in which exercises were used It aims to perform strong and fast movements and by using resistances according

to the scientific foundations of the sports training process, which contributed effectively and significantly to burning calories and fats in the research sample by increasing the level of metabolism rate; Because when doing these intense exercises on a regular basis, the metabolism rate increases many times from the basic rate in the body, the metabolism rate of the individual athlete will remain high not only during the performance of the exercises, but after completing them as well, and this means that the body of the individual athlete continues the process of burning calories during Rest and throughout the day, and therefore the higher the rate of burning calories, the higher the rate of burning body fat, and also that this type of intense training and using resistances builds muscles and preserves muscle tissue from atrophy and keeps it in good condition, and confirms (Ahmed Muhammad Muhammad and others, 2022) On the authority of (Aaron) “that the exercises practiced by athletes and ordinary individuals in various forms lead to important physiological changes that improve public health (such as developing the efficiency of the circulatory and respiratory systems, maintaining body weight, and getting rid of excess obesity” (3), and you see (Shatha Hazem, 2005) on the authority of (Abdel-Fattah and Sayed) “Achieving a suitable body composition is a primary goal for many training programs in order to get rid of excess obesity and in order to increase muscle mass, and these effects also occur in an accompanying manner with specialized training programs for various sports activities.” (12). The exercises that help improve fitness come through reducing the percentage of fat in areas of the body, and the higher the intensity of the exercises, the lower the percentage of fat in the body (9).

By analyzing the results of the statistical (T) test for the post-tests, it appears from Table (5) that there are significant differences in favor of the experimental group in the variables studied, except for (measurement of abdominal

circumference at the level of the navel, measurement of thigh circumference, measurement of body weight). Non-significant differences appeared in the tests. The distance between the control and experimental groups, although the arithmetic mean of the experimental group was superior to the arithmetic mean of the control group, but it did not reach significance according to the statistical program. The positive effect on improving the results of the post-tests, and this is consistent with what was indicated by (Sally Muhammad, 2022) on the authority of (Ashraf Mahmoud): “The importance of Tabata exercises lies in moving the largest number of muscles and developing the elements of physical fitness” (10); Because it is one of the effective and modern training methods in application, as it includes in this method many exercises using resistances that improve the level of fitness elements, and (Tabata) exercises depend on performing high-intensity, fast and repetitive movements or exercises with the largest possible number of repetitions in a short time With taking quick intervals to rest between these exercises, and thus improving the level of fitness elements for individuals, proper muscle building, and reaching burning more calories, remember (Nesma Muhammad, 2018) on the authority of (Carl Foster) that “Tabata exercises have a positive effect on the development of And improving various elements of physical fitness” (18).

It is worth noting that we often cannot rely on weight measurement only when evaluating the training and physiological status of the trainees in fitness and weight loss halls, because it has been scientifically proven that scientific and sound training in exchange for every fat burning is building muscle or at least preserving the gained muscle. In this regard, (Shatha Hazem, 2005) mentions (al-Takriti and Muhammad Ali) “The process of losing weight must be at the expense of the percentage of fat stored in the body and an attempt to reduce it. This is done by reducing the number of calories entering the

body, by following an organized diet (Dieting) And consuming a large number of calories by practicing an organized sporting activity” (12), and in the opinion of the researchers, this is a clear reason why some variables (measuring the circumference of the abdomen at the level of the navel, measuring the circumference of the thigh, measuring the body weight) do not reach the statistically significant level.

Conclusions and recommendations

In light of the research results and their discussion, the following can be concluded:

Tabata-style exercises have a positive effect in improving the level of some functional and morphological variables and physical fitness in the experimental group.

- The control group that used the followed training program achieved a significant effect in favor of the post-test in some of the investigated variables (measuring the number of breathing times after exertion, measuring the upper arm circumference, a 150-meter shuttle run test, a sitting-from-lying-on-the-back test, a lean-back test. Front bend and extend arms during 60 seconds, jump test (half squat).

- There was no significant effect of some of the investigated variables (measuring abdominal circumference at the navel level, measuring thigh circumference, measuring body weight) in the post-tests between the control and experimental groups.

- The experimental group achieved superiority over the control group in terms of the results of the arithmetic means of the post-tests in the variables investigated.

According to the conclusions of this research, the researcher recommends the following:

- The necessity of developing all elements of physical fitness through academic training programs because of their direct connection to all physiological variables and the recovery process in order to reach more reliable and accurate results.

- Emphasizing the participation of trainers in scientific and academic training courses on an ongoing basis in order to obtain the latest training information about the application and correct understanding of the different and modern training methods.
- The need to conduct similar research for different age groups and for both sexes and to include other functional, biochemical and physical variables. In order to achieve the best physical levels and sporting achievements. In order to obtain better results in some physical components in Tabata training, it is preferable to rely on adjusting the calorie calculation required for the individual athlete.

Author's declaration:

Conflicts of interest: None

We confirm that all tables and figures in this article are ours and written by the researchers themselves.

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All contributions of this study were done by the researchers (R.R., B.M. and K.K.) who get the main idea and work on writing and concluding also with number of experts, Hussein Shafieq Shwani in Statistics, Huda Shihab in revision, Nour Riadh in translating, Mazin Hadi in proofreading

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Appendix (1)
Model of a training unit

The week: first			Objective of the training unit: Developing the elements of physical fitness			
Unit parts	.Seq	.Exercises no	Exercises duration	Rest between excersises	Groups	Rest between groups
"Main section tabata workouts	1	carried a medicine ball and ran (20) meters in a shuttle way back and forth between two people	20 sec.	10sec.	4	5.3 – 3
	2	Throwing a medicine ball weighing (3) kg on the wall with both arms and over the head, a distance of (1) meter				
	3	From a standing position, shoulder-width apart and a quick step forward with both feet.				
	4	Exercise (Russian twist) from the position (sitting with feet in front)				
	5	Fitness bike exercise				
	6	Arm flexion and extension exercise (push up) from the frontal support position.				
	7	Sit-up exercise from lying down (belly), throwing a 1 kg medicine ball on the wall				
	8	Thruster) push the bar up from the front (bending and extending the elbows) from the squatting position (Dabni)				

Appendix 2(

Names of the experts to whom the form was presented regarding the validity of the training program

.Seq	Name	Neckname	Specialization	Workplace
1	Dr. Hassan Hashem Abdullah	Assistant professor	Sports coaching science	Halabja University - college of Physical Education
2	Dr. Amanj Ali Hussein	Assistant professor	Physiology of sports tra	Sulaymaniyah University - College of Physical Education and Sports Sciences
3	Dr. Rond Muhammad Ali	Assistant professor	The science of athletic	Sulaymaniyah University - College of Physical Education and Sports Sciences

تأثير تمارينات Tabata باستخدام المقاومات في بعض مكونات اللياقة الصحية والحركية لدى المتدربات باعمار 30 – 39 سنة

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2 و3 جامعة السليمانية/ كلية التربية البدنية و علوم الرياضة

تضمنت اهمية البحث في اعداد تمارينات Tabata باستخدام المقاومات في بعض المتغيرات الوظيفية والمورفولوجية واللياقة البدنية لدى المتدربات في مراكز اللياقة البدنية لغرض الارتقاء بمستوى عناصر اللياقة البدنية و حرق السعرات الحرارية لدى المتدربات، هدف البحث الى اعداد تمارينات Tabata باستخدام المقاومات لعينة البحث، التعرف على الفروق بين الاختبارات القبلية والبعديّة في المتغيرات المبحوثة لدى المجموعتين الضابطة والتجريبية، التعرف على الفروق بين الاختبارات البعديّة في المتغيرات المبحوثة لدى مجموعتي البحث الضابطة والتجريبية، استخدام الباحثون المنهج التجريبي كونه يلائم طبيعة مشكلة البحث المراد حلها، تم تحديد مجتمع البحث بالطريقة العمدية من المتدربات المشتركات في الصالة الرياضية (كليك بوكسينك باوه نور) بأعمار (30-39 سنة)، والبالغ عددهن (30) متدربا، وتم اختيار (14) منهن كعينة للبحث، وبنسبة (46%) من المجتمع الكلي، وتم تقسيمهم عشوائيا الى مجموعتين، تجريبية وضابطة، وكل مجموعة تتكون من (7) متدربات، تكون المنهاج التدريبي من دورتين متوسطتين، كل دورة متوسطة تحتوي على (3) دورات تدريبية صغرى (اسبوعية)، وعدد الوحدات التدريبية الاسبوعية (3) وحدات ولمدة (6) اسابيع اي (18) وحدة تدريبية، تموج الحمل لكل اسبوع كانت (1-2) اي ان التغير كانت بالحجم مع ثبات الشدة والراحة، عدد التمارينات في البرنامج التدريبي تكونت من (42) تمرين، وكل وحدة تدريبية تضمنت (8) تمارين، وقد توصل الباحثون الى الاستنتاجات الآتية: ان التمارينات باسلوب Tabata لها تأثير ايجابي في الارتقاء بمستوى بعض المتغيرات الوظيفية والمورفولوجية واللياقة البدنية لدى المجموعة التجريبية، لم تظهر تأثير معنوي لبعض المتغيرات المبحوثة (قياس محيط البطن بمستوى السرعة، قياس محيط الفخذ، قياس وزن الجسم) في الاختبارات البعديّة بين المجموعتين الضابطة والتجريبية. وهذا ما يحقق احد اهداف التنمية المستدامة للامم المتحدة في العراق (الصحة الجيدة).

Tabata ، المتغيرات الوظيفية، المورفولوجية، اللياقة البدنية

الكلمات المفتاحية