

The Effect of Using Cardio HIIT Exercises on Developing Cardiorespiratory Fitness and Body Mass Index in Order to Lose Weight for Women Aged 30-35 Years.

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Abstract

The purpose of this paper is to identify the effect of Cardio HIIT exercises on developing cardiorespiratory fitness and body mass index in order to lose weight for women aged 30-35 years, and identifying the effect of Cardio HIIT exercises on developing cardiorespiratory fitness and body mass index in order to lose weight for women aged 30-35 years. The experimental method was used by designing two groups (the experimental group and the control group) with a pre-and post-measurement for its suitability to the nature of the problem. The research community was determined from the trainees in the Banovtense Ladies Fitness Hall in the Governorate of Babylon/Hilla for the season (2021-2022) AD, numbering (16) female trainees, aged (30-35) years, and the sample was chosen randomly by lottery by (12) trainees and they were divided into two groups (experimental and control), each group (6) female trainees, and the sample represented 75% (5%) of the research community. (3) female trainees were used for the exploratory experiment, and one female trainee was excluded for not complying with the training units. One of the most important results obtained by the researchers is that: (Cardio HIIT) exercises were effective in developing cardiorespiratory fitness because they work directly on the heart, circulation, respiratory and muscular systems, and (Cardio HIIT) exercises had a positive effect on the body mass index of the trainees, which led to their weight loss. One of the most important conclusions obtained by the researchers is that: The necessity of using Cardio HIIT exercises prepared by the researcher for the age groups of trainees aged (30-35) years and older groups in order to lose weight, and the necessity of using Cardio HIIT exercises for women and men alike because of its impact on developing cardiorespiratory fitness and of its great importance in accomplishing many sporting events.

Introduction:

The ideal body weight is a vital issue for a person during the stages of his life and the development of his maturity. It is also one of the necessary indicators to monitor the health and functional status under which researchers and specialists in the medical and sports fields work. The increase in weight above the ideal proportions is a topic that cannot be ignored when talking about physical fitness, even if we worked to improve and develop

the level of physical fitness for a person, whether he is an athlete or a non-athlete, so that every component of physical fitness is developed without working on measuring and specifying the components of his body. In particular, determining what a person carries of fat mass must be a program that lacks accuracy and science that leads us to the optimal elements.

Cardio HIIT exercises are among the modern exercises that have great importance in improving the efficiency of both muscular and respiratory work, and through the exchange between the period of maximum effort and the period of rest, which is one of the fastest and most effective in cardiorespiratory fitness because it directly affects the heart muscle and blood vessels. For short periods of high effort that follow rest times. By continuing to perform frequent, high-intensity exercises gradually, the body adapts to these exercises and improves its performance in them. In addition, that these exercises increase the body's ability to consume oxygen, the quality of breathing, the strength of the lungs and their ability to receive and distribute oxygen to the body, and this is reflected in the improvement of metabolism and burning calories in the body.

The practice of HIIT exercises (Cardio) is one of the most important exercises that lead to strengthening the heart muscle, greatly improving blood circulation, improving metabolism by improving metabolic processes, improving energy production and thus reducing body weight, and improving the work of glands. Significantly hormonal, improvement in relieving any symptom that may lead to depression of the individual, reducing individuals feeling tired.

From all of the above, we see that Cardio HIIT exercises have an important and effective role in developing cardiorespiratory fitness and BMI. Hence, the importance of research in studying the effect of using Cardio HIIT exercises in developing cardiorespiratory fitness and BMI in order to lose weight for women aged 30 - 35 years.

Research problem:

Through the researchers's knowledge in this field, I found that the Cardio HIIT exercises that are used in most fitness halls are of the second type, of light intensity, as they take a long time in training to achieve the desired goal, and by reviewing recent studies and following up on the researchers to everything that is new. In this area, it was found that exercises (Cardio HIIT) (One of the important exercises that may exceed the second type of Cardio exercises) in terms of effort and time, especially agility exercises, which are characterized by the continuity of performance for periods that may reach more than 30 minutes. Hence, the problem of the study descended, and the researchers believed in scientific research is the most appropriate scientific method for solving problems, so the researchers applied Cardio HIIT exercises according to correct scientific foundations in order to lose weight and reach an ideal body for women. This comes through applying the exercises prepared by the researchers and knowing their effects on the cardiorespiratory fitness and body mass index of women, and we hope that it will be a scientific addition that may contribute to solving real problems that our beloved society suffers from in general and women in particular.

Research objective:

- Identifying the effect of Cardio HIIT exercises on developing cardiorespiratory fitness and body mass index in order to lose weight for women aged 30-35 years.

Research hypotheses:

- There is a positive effect of Cardio HIIT exercises in developing cardiorespiratory fitness and BMI in order to lose weight for women aged 30-35 years.

Research fields:

- Human field: Female fitness trainers in (Banovtense Ladies Fitness Hall) aged 30-35 years for the season 2021-2022.
- Time field: (11/11/2021) to (15/3/2022).
- Spatial field: Banovtense gymnasium for women's fitness in Babylon Governorate / Hilla.

Research methodology and field procedures:**Research Methodology:**

The experimental method was used by designing two groups (the experimental group and the control group) with a pre-and post-measurement for its suitability to the nature of the problem.

Community and sample research:

The research community was determined from the trainees in the Banovtense Ladies Fitness Hall in the Governorate of Babylon/Hilla for the season (2021-2022) AD, numbering (16) female trainees, aged (30-35) years, and the sample was chosen randomly by lottery by (12) trainees and they were divided into two groups (experimental and control), each group (6) female trainees, and the sample represented 75% (5%) of the research community. (3) female trainees were used for the exploratory experiment, and one female trainee was excluded for not complying with the training units.

Homogeneity and equivalence of the research sample:

To confirm the objectivity of the research and move in the right direction, the researchers found homogeneity and parity between the two research groups in terms of basic and physiological variables within the framework of the research (height - weight - age - training age - cardiorespiratory fitness - body mass index BMI) using appropriate statistical treatments for that As shown in Tables (1) and (2).

Table (1) shows the homogeneity of the research sample.

Variables	Measuring unit	Leven(test)		Type sig	level sig
		calculated	Sig		
Length	meter	4.312	0.065	Non sig	Homogeneity
weight	kg	0.294	0.599	Non sig	Homogeneity
the age	year	1.364	0.270	Non sig	Homogeneity

training age	year	1.250	0.290	Non sig	Homogeneity
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It is evident from Table (1) that the significance level (sig) for the selection value (Leven-test) is greater than (0.05) and for all variables for the two groups (experimental and control), which indicates the homogeneity of the sample members.

Table (2) shows the equivalence of the research sample

Variables	Measuring unit	Experimental		Control		T value	Level sig	Type sig
		Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
cardiorespiratory fitness	L/kg/min	39.755	1.205	40.530	1.572	0.958-	0.361	Non sig
body mass index (BMI)	kg/m	30.763	1.294	30.153	2.235	0.578	0.576	Non sig

It is evident from Table (2) that the two research groups (experimental and control) are equivalent in the results of the dependent variable tests, as the calculated (t) values were not statistically significant at the significance level (0.05) and the degree of freedom (10) if the level of significance was (sig) greater than (0.05), which indicates that the two groups are on the same starting line in all tests.

Means - tools - and devices used in the research:

In order to obtain accurate and achievable results for the objectives set and to ensure an adequate solution to the research problem, the researchers used the following devices and tools:

- Note.
- Tests and measurements.
- Fit mate pro, made in Italy, to measure cardiorespiratory fitness, number (1).
- An integrated fitness hall.
- Electronic stopwatch (Kislo), made in China, number (2).
- Japanese-made (Canon) video camera, number (1).
- (TOSHIBA) Chinese-made laptop, one (1).
- Canadian Fox Whistle (2).
- A metal measuring tape with a length of (3) m, number (1).
- Bars, ropes of different lengths, collars of different sizes, small and large barriers.
- Wood bench with a height of 40 cm, 12 pcs.
- A medicine ball weighing 2 kg, number (6).

Description of the tests used in the research:

A life fitness test to measure cardiorespiratory fitness(Al-Assiouty, 2011)⁽¹⁾.

The "In Body" device was used to measure the body mass index, which is a modern device used to measure the body mass index and the percentage of body fat.

Experimental Experiment:

The researchers conducted the exploratory experiment on a number of female trainees outside the main research sample, as they were randomly selected from the research community and their number was (3) trainees. At exactly three o'clock in the afternoon on Monday 15/11/2021 in (Banovtness Women's Fitness Hall) in the Babil Governorate Center, the study aimed to:

- Ensuring the validity of the equipment and tools used and their suitability for the tests.
- Measuring the time of the tests used in the research.
- Identify the intensity and time of the exercises for the research sample.
- Know the rest times between repetitions and exercises.
- Practical training of the researchers and the assistant work team to find out the negatives and positives that accompany the application of the tests in terms of requirements and method of work.

Pre-tests:

The researchers conducted pre-tests and measurements on the members of the research sample for the two groups (experimental and control), which numbered (12) trained with the dependent variables (cardiorespiratory fitness - body mass index - weight) and this was done over three days as follows:

The first day: on November 20, 2021 at the Health Clinic at six o'clock in the evening, and the following measurements were taken:

- 1- Body mass index (BMI).
- 2- Weight (Weight).

The second day: on November 22, 2021, at exactly ten o'clock in the morning at Banovtness Ladies Fitness Hall in order to measure cardiorespiratory fitness.

In addition, the researchers worked to establish the conditions of the test itself to work on their availability as much as possible in the post-tests in terms of time, place, devices, tools and method of implementation.

Cardio HIIT exercises prepared by the researchers:

- The duration of the experiment is (10) weeks at a rate of (30) training units, an average of three units per week.
- The exercise time ranged between (30-35) minutes.
- The training days during the week were (Sunday, Tuesday, and Thursday).
- The training method used is the high-intensity interval training method and the repetitive training method.
- The intensity used is (80%-95%) of the trainee's maximum ability.

- The researchers took into account the principle of diversity by giving exercises so that the trainees did not feel bored during the training.

Main experience:

The researchers applied the exercises prepared in a high-intensity interval training method on the experimental research sample for a period of 11/25/2021 until 15/2/2022.

Post-tests:

The post-tests were conducted for the period from 17-18-20/2/2022 and under the same conditions, conditions and instructions that were used in the tribal tests, with the help of the supervisor.

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

Presentation, analysis and discussion of results:

Presentation and analysis of the results of the tests in the pre and post measurement of the two research groups and their discussion:

Presenting the results of the differences between the pre and post-tests of the experimental group.

The researchers used the (t) test to extract the significant differences between the results of the tests in the pre and post measurements for the two research groups, as shown in Tables (3) and (4).

Table (3) shows the arithmetic means, standard deviations, the calculated (t) value and its level of statistical significance for the pre and post-tests of the experimental group for the variables investigated.

Variables	Measuring unit	Pre-test		Post-test		T value	Level sig	Type sig
		Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
cardiorespiratory fitness	L/kg/min	39.755	1.205	43.553	1.128	10.682-	0.000	Sig
body mass index (BMI)	kg/m	30.763	1.294	26.240	1.021	6.735	0.001	Sig

Presentation and analysis of the results of the tests and measurements pre and post to the control group.

Table (4) shows the arithmetic means, standard deviations, the calculated (t) value and the level of its statistical significance for the pre and post-tests of the control group for the studied variables.

Variables	Measuring unit	Pre-test		Post-test		T value	Level sig	Type sig
		Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
cardiorespiratory fitness	L/kg/min	40.530	1.572	41.288	1.181	3.139-	0.026	Sig
body mass index (BMI)	kg/m	30.153	2.235	27.601	0.584	2.656	0.045	Sig

Presentation, analysis and discussion of the results of tests and post measurements for the two research groups (experimental - control)

Table (5) shows the arithmetic means, standard deviations, the (t) value calculated for the independent samples, the level of test significance, and the significance of the differences between the results of the post-tests for the two research groups (experimental - control) for the investigated variables:

Variables	Measuring unit	Experimental		Control		T value	Level sig	Type sig
		Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
cardiorespiratory fitness	L/kg/min	43.553	1.128	41.288	1.181	3.395	0.007	Sig
body mass index (BMI)	kg/m	26.240	1.021	27.601	0.584	2.834-	0.018	Sig

Discuss the results:

First: Discussing the results of the cardiorespiratory fitness variable:

Through the presentation and analysis of the results of tests and measurements before and after the experimental and control groups in Tables (3) and (4), there were significant differences between the two tests (pre-and post-test) in favor of the experimental group, which indicates that there is a development in the cardiorespiratory fitness variable in favor of the group's post-test Experimental.

The researchers attribute the development in the experimental group to the application of Cardio HIIT exercises, as they were applied in a well-studied scientific manner according to most of the scientific studies that indicated that these exercises develop the maximum consumption of oxygen, which expresses the measurement of cardiorespiratory fitness, and this is consistent with (James Driver.2012), which confirms that the use of high-intensity interval training (Cardio HIIT) in training units is of great importance in improving cardiorespiratory fitness⁽²⁾. In addition, (Cardio HIIT) exercises increase the efficiency of the

heart, respiratory and muscular systems, which has a direct relationship with the cardiorespiratory fitness variable ⁽³⁾. The researcher also attributes the improvement that occurred to the experimental group in the post-test to the continuation of the trainees and their regularity in training, which had a clear and effective role in developing their cardiorespiratory fitness, and this was confirmed by (Syd Hoare) that continuous training represents an important place in the athlete preparation program at all physiological and physical levels and skill, because of its importance in improving cardiorespiratory fitness, which helps the trainee to perform physical effort continuously and with the highest possibility (Syd Hoare. A.Z. 1994) ⁽⁴⁾. This is consistent with the results of some studies conducted by the American College of Sports Medicine, which demonstrated that Cardio HIIT exercises three times a week for 10 weeks increase cardiorespiratory fitness and endurance.

There is no doubt that commitment to training and regularity in it will lead to physiological changes in all functions of the body's systems, especially the respiratory system, and this was indicated by (Hussein Manati and Ahmed Farhan) that "regularity leads to the practice of sports training, especially anaerobic training loads that depend on the use of high intensity, including high-intensity training, to a set of physiological changes that express the efficiency of breathing processes in athletes, and their adaptation to sports training compared to individuals who do not practice sports, and among these adaptations is the improvement of the strength and efficiency of the breathing muscles, especially the muscles between the ribs and the diaphragm muscle, the size of the rib cage increases in expansion and flexibility during the breathing process, and this allows for better performance of respiratory processes in athletes, especially when performing physical exertion (5) .

Second: Discussing the results of the BMI variable and the weight variable:

The researcher attributes the emergence of significant differences in favor of the post-test of the experimental group in the decrease in the body mass index (BMI), which is a categorical indicator of weight gain and is approved by many international health organizations, as the decrease in body weight and fat percentage is due to the effect on the body mass index and its decrease. Because it depends in its calculation on dividing the body weight by the square of the body height, and since the bodyweight has decreased in general, the body mass index, in turn, has decreased accordingly.

The effect of Cardio HIIT exercises was positive in reducing body mass and reaching lower levels, as (Hazzaa Al-Hazaa .2010) identifies the role of physical activity in reducing body mass by:⁽⁷⁾

- Increasing the use of body fat as an energy source.
- Reducing the loss of muscle mass.
- Physical activity has a real role in combating and preventing weight gain in the long term.

The results of analyzing the statistical data obtained using the (t) test for independent samples showed significant differences between the two groups (experimental - control) in the development of somebody components (BMI - weight) in favor of the experimental group at the expense of the control group.

The researchers believes that these results are due to the program that was prepared and consisting of (Cardio HIIT) exercises, which raised the level of physical activity through the

trainees performing various and successive movements and helped maintain the muscle mass of the body and reduce the percentage of fat, in addition to that the use of exercises helped It oxidizes quantities of fats stored in the body to benefit from them in producing the energy needed for physical activity (exercises) and it is of great importance during the exercise of sports activity because of its potential to consume fats as a source of energy from the muscles and because it helps in the metabolism of fatty acids and their conversion from fatty tissues to the blood, usually It appears after a long period of exercise, and the secretion of this hormone increases during sports activity for its benefit to connective tissues and muscle growth, which increases the strength of tendons, ligaments and muscles.

The researchers also sees that there is a correlation between (Cardio HIIT) exercises by their nature between tension, relaxation, performance, interfacial comfort, ascending and descending with the performance of movements. The body and weight are from the oxidation of fats to be used for energy, and here (Hazaa Al-Hazaa. 2001) conveys the American Federation for Health, Physical Education, Recreation and Kinetic Expression, “He must take into account the close relationship between Cardio HIIT exercises, health and physical activity, as they are those elements that are related or affect health. cardiorespiratory fitness body composition, and musculoskeletal fitness”⁽⁸⁾.

Conclusions and Recommendations

Conclusions:

- (Cardio HIIT) exercises were effective in developing cardiorespiratory fitness because they work directly on the heart, circulation, respiratory and muscular systems.
- (Cardio HIIT) exercises had a positive effect on the body mass index of the trainees, which led to their weight loss.
- The (Cardio HIIT) exercises were very suitable for the trainees aged (30-35) years, and this was shown to us by the trainees continuing to exercise without any injury to them.

Recommendations:

- The necessity of using Cardio HIIT exercises prepared by the researcher for the age groups of trainees aged (30-35) years and older groups in order to lose weight.
- The necessity of using Cardio HIIT exercises for women and men alike because of its impact on developing cardiorespiratory fitness and of its great importance in accomplishing many sporting events.

References:

- 1- Abdel-Sami' Jamal Al-Assiouty. 2011. Physiological criteria for functional tests, Dar Al-Fikr Al-Arabi, Cairo, p. 197.
- 2- James Driver.2012.. high intensity interval training explained(Createspace Independent Pub) p.p20
- 3- (<https://www.egyfitness.com/hiit/>).
- 4- Syd Hoare. A.Z. 1994. The Judo, published by ippon Books, led, 447, London, N12OAF, England, p477.
- 5- <https://www.egyfitness.com/hiit/>).

- 6- Hussein ManatiSajit and Ahmed Farhan. 2017. The Physiology of Physical Effort, 1st Edition, Babel, Al-Sadiq Institution for Printing, Publishing and Distribution, p. 212
- 7- Hazaa bin Muhammad Al-Hazza. 2010. Selected Topics in the Physiology of Activity and Physical Performance, Part 1, Kingdom of Saudi Arabia, Riyadh, King Saud University, Scientific Publishing and Printing Press, p. 319.
- 8- Hazaa bin Muhammad Al-Hazza and et al. 2001. The guideline for the health-related physical fitness test for the countries of the Cooperation Council for age groups from 7-18 years, i, Riyadh, p. 13.