

The Effect of Exercises with a Mini-Trampoline Device on Body Fat and Bone Density for Female Trainees Aged (25-30)

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Abstract

The importance of the research lies in the introduction of the mini jump bounce device among the important devices in Sports halls, as it has many benefits on the body in addition to the recreational aspect. The researchers used the experimental method with two groups (control and experimental) and the researchers chose the sample in an intentional way. The research community was represented by the trainees in the Fitness Hall (Beirut Bride) in Karbala city, and their number reached (20) trainees.

Through perusal and research, it was found that most of the trainees in sports halls are heading to traditional devices such as Treadmill, stationary bike and ground exercises, moving away from modern trends in sports, in addition to the absence of an Arab study that contained the importance of the device and its effect on the human body in general. The results showed a significant improvement in body fat percentage and bone density among the trainees when using the device.

The recommendations included the need to emphasize the introduction of the mini trampoline device from among the sports equipment used in sports centers because of its positive impact on the health aspects of these ages, and the generalization of its results to all fitness centers, as well as conducting studies concerned with the mini trampoline device on new aspects that have not been completed. Study it before and on other age groups.

Keywords:Mini Trampoline device, body fat, bone density.

Introduction:

Scientific studies and practical practices have unanimously agreed that exercise is the cornerstone of maintaining health for all, men and women equally, old, young or children, and despite the importance of regular exercise, it is also important to know how long it should be in Exercising, and the necessary types that should be followed in different age groups.

According to medical and sports experts, from the age of 18-30 years, this is the easiest age to maintain a healthy body weight because the rate of metabolism is at its highest efficiency, as the body can burn more calories, whether at rest or during work, and the intensity bones increase between the ages of 25 to 35 years, and muscle mass reaches the end of its growth at about twenty-five years of age, and this means that you should find it easier at this age than at any other age to maintain muscle harmony, slimness and agility of the body its consistency in general.⁽¹⁾

With the advancement of technology that swept all areas of life and entered its development, including those related to physical fitness and public health, through the use of modern and developed sports devices, the mini trampoline is considered one of the most important devices that add entertainment and fun as well as its effect on components The body of the individual

and it is one of the modern devices that contain great benefit on the human body because it gives the opportunity to perform rhythmic and non-rhythmic floor exercises on it, especially since its rubber pad reduces the exposure of the joints to pressure while performing the exercises, helping to stimulate blood circulation and reach more oxygen to the cells of the body, which increases the energy level of the individual, as well as its effect on the bones mainly⁽²⁾.

Here, the importance of the research appears, as the prepared exercises are linked to modern, unconventional sports equipment that helps to gain the desired goal in addition to the recreational aspect generally.

Research problem:

Being a trainer at the Fitness Center, I noticed that most women in gyms tend to use traditional devices, as they are common among most trainees, and use the bounce jump device from little to no, and it is used as a recreational device, nothing more, ignoring its great benefits on the body, including that it helps reduce the risk of bone diseases. For example, (osteoporosis, fractures ...) because applying frequent light pressure on the muscular system while jumping strengthens bone stiffness in the face of rebound pressure and also increases metabolism and metabolism rates, which means that the calorie-burning process continues even after the end of the jump, as well. It works to promote public health and the processes that take place in the body, especially for the ages specified in the research, and after the survey and research, the researcher found that there was no Arab study or research on the benefits of this device, especially when linked to the health aspect, and from here the researcher relied on preparing exercises to be performed on mini trampoline the mini, which is one of the devices rich in positive benefits on the body as a whole because it has a flexible and rubbery surface, in addition to the side of excitement and fun, as a new addition in the field of health fitness for women Ages (25-30) years.

Research objective:

- Preparing exercises for the mini trampolinedevice.
- Significant the effect of stomach exercises on the mini trampolinedevice of female trainees aged 25-30 years on body fat and bone density.

Research methodology and field procedures:

Research Methodology:

The researcher used the experimental method for its relevance to the research problem.

Research sample:

Represented by the trainees in the fitness hall (Bride of Beirut) in the holy Karbala, and the sample was chosen by the deliberate method and by the method of the two groups (control and experimental) and the number of (20) trainees, (10) trainees for each group.

Devices and Search Tools:

- German training system (training beurer), which contains the following:
 - Electronic scale (BF 195) that measures morphological variables (body fluids, bone density, muscle mass, fat percentage, body weight, and BMR metabolic rate) count (1).
 - A smart watch (AS97) that gives accurate results for some physiological variables such as pulse rate, blood pressure and heart rate, in addition to saving and recording training data on the phone and computer using its own (5) application.
- Mini trampoline (10)

- A Dell lap top computer to transfer data from the training system, count (1)
- MP3 player with Flash memory for music
- Canon photographic camera, count (1)

Field research procedures:

Search variables:

- **Body fat:** the organic compound and insoluble in water and melt in a range of solvents fats such as alcohol and acetone and ether and others, and there are stores the fatty key in humans in the fatty tissue under the skin and in the muscles and tissues mesenteric as stored in their cells amount grease enables the individual to live for a long period of up (40) days when you drop the food⁽³⁾.
- **Bone density:** It is the amount of bone tissue in a specific size of the bone. bone mineral density (BMD) test is one of the most important tests for bone density expressed in the mineral mass per unit volume of bone⁽⁴⁾.

Determine healthy fitness tests:

Use a device with the specifications shown in the following:

- The device works with a dry battery
- The trainee's information is entered before the measurement (a special number to refer to the information of the person who performs the measurement, age, training level, height, gender)
- Take measurements electronically without interference from the person doing the measurement

Measurement procedures:

- The measurer operates the device and identifies a number assigned to the trainee, such as (p1, p2, p3...).
- The trainee's information (age, training level, height, gender) is entered.
- After entering the information, the trainee climbs up on the device from a standing position with the body straight and looking forward and the body is fixed.
- Then the data appears on the screen of the device, first, the bodyweight is shown and after a minute of stability, the device will have read the rest of the data (body fat, bone density).
- After that, the researcher records the data on the trainees separately.

First exploratory experience:

The first exploratory experiment was conducted on the exploratory research sample of (5) participants on (Tuesday) corresponding to (1/12/2020) at ten in the morning in the (Beirut Bride) center located in the holy Karbala, and through this experience, the researcher was able to know the following:

- Identify the obstacles facing the examination procedures and the training curriculum.
- Identify the time taken to perform the tests and exercises used.
- Ensure the validity of the tools and the availability of capabilities for applying the tests.
- Identify common errors during performance.

The second exploratory experiment:

The researcher conducted the second exploratory experiment on Sunday, 12/6/2020 at ten in the morning, at the (Bride of Beirut) Center in Karbala, who numbered (5), and they were members of the first exploratory sample, and it is an exploratory experiment on the exercises designed by the researcher as an initial attempt aims behind the researcher to a number of goals,

including the identification of the possibility of continuing research, "⁽⁵⁾where the researcher conducted a training module designed exploratory exercises were aimed at:

- Identify the total time spent for one training unit
- Identify how to perform the exercises and the difficulties that the trainees face in performing on the device

pre-tests:

The researcher conducted the pre-tests for the experimental and control groups on (Sunday) 12/20/2020 at ten in the morning.

Training Curriculum:

The researcher prepared a training curriculum for three months from Sunday, 27/12/2020 to Thursday, 18/3/2021 divided into two phases, the first for a month and is preparatory for the purpose of familiarizing with the use of the (Mini Trampoline) device in carrying out the exercises, Therefore, four weeks were allocated for the purpose of preparing for the implementation of the main exercises, which began on Sunday, 12/27/2020, to Thursday, 1/21/2021.

The researchers also devoted two months, up to 12 weeks, in implementing the main exercises, which began on Sunday 23/1/2021 to Thursday, 3/18/2021, and the number of training units reached (36) training units by three training units per week, which were carried out in days (Sunday, Tuesday and Thursday) and to take into account the reality of the non-sports research sample, the training curriculum was designed to be suitable for them in allocating short-time and easy-to-implement exercises in the month of preparation and then gradually increasing the time with increased comfort and the stability of repetition of exercises and groups, i.e. the increase in intensity, difficulty and stability in size, as was done Using the principle of re-exercise, i.e. repeating the exercises within two weeks to increase the time and increase the rest using the principle (1-3) for the rest time, i.e., the work time to three so that the rest time is formed because the performance time is short, and the number of exercises in each training unit is five exercises that are repeated within two weeks and in two groups interspersed with rest, and when moving to the other exercise there is rest as well. More difficult and repeated for two weeks, then the increase in time and rest in the following two weeks, and so it is applied in the third month as well.

As indicated in the appendix, the exercises (time and intensity) were designed according to the phosphatic energy system, which is commensurate with the nature of the exercises and the total repetition of exercises with their time, and the training unit interferes with the lactic system and the oxygen system in varying proportions according to performance.

Post-tests:

The post-tests for the two research groups were conducted on (Sunday) corresponding to (21/3/2021) at exactly ten o'clock in the morning. The researcher took into account the place and time in conducting the post-tests.

Statistical treatment:

The Statistical Package for the Social Sciences (SPSS) was used in treating the results statistically.

Presentation, analysis and discussion of the results:

Presentation, analysis and discussion of the pre and post-tests for the control group:

Table (1) shows the values of the statistical coefficients for the research variables in the research sample.

Variables	Test	Arithmetic mean	Standard deviation	Difference between arithmetic mean	Difference between standard deviations	T value	Sig level	Sig type
Bone density	Pre-test	9.330	0.305	-0.170	0.030	-5.667	0.00	Sig
	Post-test	9.500	0.326					
Body fat	Pre-test	36.100	2.857	0.700	0.068	10.247	0.000	Sig
	Post-test	35.400	2.934					

Table No. (1) Shows the arithmetic mean, the standard deviation, the value (t) calculated for the samples, the level of significance of the sig test, and the significance of the differences for the control group in the pre and post-test. The arithmetic mean of the post-test was (9.500) with a standard deviation of (0.326) and the (t) value of the correlated samples was (-5.667). The value of the significance level of the sig test was (0.000), which is smaller than the significance level (0.05), which indicates that the differences were significant and in favor of the post-test. Where we find that the arithmetic mean of the pre-test for the percentage of fats was a value of (36,100) and a standard deviation of (2,857), while the arithmetic mean of the post-test was a value of (35,400) and a standard deviation of (2,934) and the value of (t) for the correlated samples amounted to (10,247). The significance level of the sig test was (0,000), which is smaller than the significance level (0.05), which indicates that the differences were significant and in favour of the post-test.

Presentation, analysis and discussion of the results of the pretest and posttests of the experimental group:

Table (2) shows the means, standard deviations, the calculated (t) value, and the level and type of statistical significance for the pre and post-tests of the studied variables for the experimental group.

Variables	Test	Arithmetic mean	Standard deviation	Difference between arithmetic mean	Difference between standard deviations	T value	Sig level	Sig type
Bone density	Pre-test	9.200	0.290	- 0.560	0.076	-7.339	0.000	Sig
	Post-test	9.760	0.134					
Body fat	Pre-test	35.880	2.615	3.740	0.158	23.581	0.000	Sig
	Post-test	32.140	2.424					

Table No. (2) Shows the arithmetic mean, the standard deviation, the value (t) calculated for the samples, the level of significance of the sig test, and the significance of the differences for the

experimental group in the pre and post-test. The arithmetic mean of the post-test was a value of (9.760) and a standard deviation of (0.134) and the value of (t) for the correlated samples reached (-7.339). The value of the significance level of the test sig was (0,000), which is smaller than the level of significance (0.05), which indicates that the differences were significant and in favor of the post-test.

The researchers found that the arithmetic mean of the pre-test for the percentage of fats was (35,880) and a standard deviation of (2,615). The arithmetic mean of the post-test was (32,140) and a standard deviation of (2,424) and the value of (t) for the correlated samples was (23,581). The value of the significance level of the test sig was (0,000), which is smaller than the level of significance (0.05), which indicates that the differences were significant and in favor of the post-test.

Discussing the results of the pre and post-tests for the research variables for the two groups (control and experimental):

Through the presentation and analysis of the results of the tests and the pre and post measurements of the control and experimental groups in Tables (1) (2), where significant differences appeared between the (pre-post) test and for both the control and experimental groups, which indicates that changes occurred in the components of health fitness in favor of the post-test.

The researcher attributes the change in the control group and in favor of the post-test to the correct application of the trainer's exercises and their commitment to her directives in order to achieve what they came for when they participated in the fitness center.

The researcher attributed that the change that occurred in the experimental group and in favor of the post-test to the application of the exercises prepared on the mini trampoline, which led to changes in the research elements, as these exercises led to a decrease in the percentage of body fat and an increase in bone density. The body and the stimulation of blood circulation in the bone tissue, which led to the supply of this tissue with the vital elements that it needs in its construction, and this is what (Osama Ahmed and others) indicated. Many new bone tissues need to be replaced, i.e. there is a complete cycle of bone-building and demolition.”⁶ Jumping on the platform helps support the health and safety of bones, and the correct practise of this sport protects from diseases that affect the bones, such as osteoporosis, where jumping on the jumping apparatus contributes. The rebound reduces stress on the bones and increases the chance of building up the mineral content and increases bone density, as well as its mild effect on the knees, hips, spine and ankles, as it works to reduce they squeak by absorbing the force upon landing from a jump so it supports bone health and increases its density and strength ⁽⁷⁾.

Thus, these reflexive exercises raise the metabolic rate and help in obtaining a harmonious body, and these exercises include many movements that lead to an improvement in the heart rate, so they are a very useful element in trying to reduce the percentage of fat, and this is what (Mohamed Adel) indicated. Exercises in integrated activities due to their diversity, comprehensiveness and different objectives, can be used to maintain human health, to raise the efficiency of their physical and physiological functions, and to get rid of excess fat that represents a burden on the heart⁽⁸⁾. Exercise on this device reduces the fat content them because the rebound exercises on the mini-trampoline mat have a great effect, and this matter agrees with the results of the study (Mahmoud Suzan) according to which "the practice of movement activity leads to the loss of excess weight" ⁽⁹⁾.

Presentation and analysis of the results of the post-tests of the two groups, the control and experimental research, and their discussion:

Table (3) shows the arithmetic mean, standard deviations, the calculated (t) value, and the level of significance of the test and significant differences between the results of the post-tests for the control and experimental groups for the studied variables.

Variables	Groups	Arithmetic mean	Standard deviation	T value	Sig level	Sig type
Bone density	experimental	9.760	0.134	2.327	0.032	Sig
	control	9.500	0.326			
Body fat	experimental	32.140	2.424	-2.708	0.014	Sig
	control	35.400	2.934			

Table No. (3) shows the arithmetic mean, standard deviation, (t) value calculated for the samples, the significance level of the sig test, and the significance of the differences for the control and experimental group in the post-test, where we find that the arithmetic mean of the post-test for the control group to test bone mass was a value of (9.500) with a standard deviation of (0.326) As for the arithmetic mean of the post-test for the experimental group, it was (9.760) and a standard deviation of (0.134) and the value of (t) for the correlated samples was (2.327), while the value of the significance level of the test sig was (0.032), which is smaller than the level of significance (0.05) Which indicates that the differences were significant and in favor of the post-test of the experimental group.

the two researchers found that the arithmetic mean of the post-test of the control group for the fat percentage test was a value of (35,4000) and a standard deviation of (2.93447), while the arithmetic mean of the post-test of the experimental group was of (32.1400) and a standard deviation of (2.42450) and the value of (t) was for the samples. The correlatedness amounted to (-2.708), and the value of the significance level of the sig test was (0.014), which is smaller than the significance level (0.05), which indicates that the differences were significant and in favor of the post-test of the experimental group.

Discussing the results of the post-tests for the research variables and for two groups (control and experimental):

Through the presentation and analysis of the results of the tests and the pre and post measurements of the control and experimental groups in Table (3), it was found that there is a significant difference between the control and experimental research groups in the post-tests and in favor of the experimental group for health fitness variables.

As it turned out that the decrease that occurred in the fat variable at a rate of (-2.708) that occurred in the experimental group came as a result of giving exercises prepared by the researcher on the mini-regressive jumping device, which led to a high heart rate and consequently more energy consumption, which led to a decrease in the percentage of fat In the body, this result is consistent with the study, "which included 20 obese women who were subjected to aerobic exercises for a period of (12) weeks. Each week included three sessions in which a decrease in the levels of fat percentage and body mass index was reached"⁽¹⁰⁾. As for bone density, the increase was at an average of (2.327). So, rebound exercises on the rebound

jumping device support bone density, bone strength and bone formation, while reducing bone resorption, as rebound puts little pressure on the bones, helping them to grow stronger⁽¹¹⁾.

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Appendix No. 1

Sample of training modules:

Training unit model for the first month by (12) training units

The goal of the exercises: to reduce fat percentage and increase bone mass

Exercise	Time	Repetition	Rest	Group	Rest between groups	Rest between exercises	Total exercise time	Unit time	Week
Fast walking on the device to the front, back, and hands	10s	3	60s	2	60s	60s	5 min	25 min	1 + 2
Jog forward and backwards with hands bent to the side									
Jumping on the device with arms raised in front									
Jumping on the device by raising and lowering the arms aside									
Jump to the sides									

with both legs and arms to the side									
Jump open and pull legs aside	12s		36s				5.6min	28 min	3 +
Jumping with transverse flexion, spreading and joining arms in front of the chest									4
Jumping with the arms rotated forward from the shoulder joint									
Jumping by bending and extending the leg arms forward for each leg									
Jump by raising the knees in front of the top and touching them with the hands									