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The Effect of a Proposed High- Intensity Training Program on the Body Composition of Males (25 to 35 years- old) Participating in Fitness Centers in Palestine

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Abstract: The study aims at identifying the effect of high intensity training program on some physical and mobile variables and on body structure among males aged between 25- 35 years participating in physical fitness centers in Palestine.

The experimental method has been used by choosing a random sample of 48 individuals distributed on 30 centers in Palestine. High intensity training program has been designed, and contains ten standardized exercises for the study sample.

The present findings showed significant differences in all physical and mobile variables in addition to body structure, except for the variable of muscle mass. These differences were in favor of the posttest. Moreover, significant differences appeared in the variable of water mass and in favor of the pre- test, despite it was a reverse result.

In light of the study results, several recommendations have been suggested, the most important of which is adopting high intensity training program in order to improve some physical, mobile variables and body structure in the body building centers for its importance in saving time and improving the physical and mobile variables and body structure.

Keywords: High intensity, Training program, Body fitness, Body structure.

أثر برنامج تدريبي مقترح بالشدة المرتفعة على تركيب الجسم لدى الذكور المشتركين في مراكز اللياقة البدنية من أعمار (25- 35) عاماً في فلسطين

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المستخلص: هدفت هذه الدراسة إلى التعرف على برامج التمارين عالية الشدة على بعض المتغيرات الجسدية والحركية وعلى بنية الجسم عند الذكور من أعمار 25- 35 عاما في مراكز اللياقة البدنية في فلسطين ولتحقيق هدف الدراسة، تم استخدام المنهج التجريبي

من خلال اختيار عينة عشوائية من الذكور تتكون من (48) فرداً موزعين على 30 مركزاً في فلسطين، وتم تصميم برنامج تدريب عالي الشدة يحتوي عشرة تمارين مقننة لعينة الدراسة. أظهرت نتائج الدراسة وجود فروق دالة إحصائياً في جميع المتغيرات الجسدية والحركية وفي بنية الجسم عدا متغير كتلة العضلات وقد كانت هذه الفروق لصالح الاختبار البعدي، كذلك أظهرت النتائج وجود فروق دالة إحصائياً في متغير كتلة الماء ولصالح الاختبار القبلي على الرغم من كونها نتيجة عكسية. وفي ضوء نتائج الدراسة، تم وضع عدة توصيات من أهمها تبني برنامج تدريبي عالي الشدة من أجل تطوير بعض المتغيرات البدنية والحركية في مراكز بناء الأجسام وذلك لأهميتها في توفير الوقت وتطوير المتغيرات الجسدية والحركية وبنية الجسم.

الكلمات المفتاحية: عالية الشدة، برنامج تدريبي، اللياقة البدنية، بنية الجسم.

Introduction

High Intensity Interval Training (HIIT) is characterized by the increased intensity and reduced volume of the load as pointed out by Shehata (2006). HIIT is mainly focused around the regular method of highly effective and directed intensity that is measured by the exerted effort. Bastwissi Ahmed (1999) states that in this type of maximum intensity training that is characterized by relatively few intermittent breaks, the muscles work in the absence of oxygen as a result of the intensity of the high load. It is also characterized by a delayed feeling of tiredness due to the adaptation that occurs in the muscles as a result of the exerted physical effort.

With the advent of many diseases caused by modern technology and the resulting lack of physical activity, the term body composition has emerged to the surface. Hazzaa Al- Hazzaa (2003) says that as a term, body composition expresses a group of parts or elements that make up a whole when linked together, which means that body composition is concerned with identifying the parts or elements which form a whole. It also means that the diseases that affect individuals as a result of the advent of modern technology and the ensuing lack of physical activity have links with the body composition and the enthusiasm of individuals to practice sports. As a matter of fact, sportsman protect the body from the dangers of diseases such as obesity, stress and others. Hence, having the knowledge about the physical component has become an indicator by which we can predict the health status of individuals. Buskirk (1986) points to the importance of body composition in helping to classify individuals and study the differences between the sexes and the societies, as well as in describing healthy growth, puberty and aging, in terms of whether they are normal or abnormal.

Many researchers, including Kayed (2013), Al- Qaddumi, Taher (2010), Nuairat and Hamarsheh (2011), emphasize that knowing the body composition is linked to the health status of individuals, the growth process and the athletic performance. They also confirm that the sports programs followed in fitness centers should be built upon proper scientific foundations that consider the objectives of the program and the capabilities of the participants. In addition, it is important to pay attention to the physical fitness elements that have proven to be a key health indicator, as well as to align the goals and the training with these elements. Kayed (2013) says that with the spread of the fitness clubs and sports gyms in our

Arab society, awareness has shifted towards the practice of regular sporting activities in these centers, leading the participants in these centers to look for the results of their physical activity.

Qaddumi and Issa (2004) aimed to identify the level of the maximum oxygen consumption (VO2max), while the study of Nass (2008) aimed to identify the effect of high intensity interval training on the development of speed endurance and some physiological variables on international football referees for the Premier League in Iraq. Ziyad Zayed study (2010) aimed at identifying the relationship of BMI on some elements of physical fitness and the maximum oxygen consumption. The study of Qadumi and Al-Taher (2010) aimed at building standard levels of BMI, body surface area, ideal weight, the ratio of the waist and pelvic circumference, metabolism during rest for students of Birzeit University. The study of Shaker and Al- Atrash (2011) sought to identify the levels of measurements of body composition and metabolism during rest among players of team and individual games at An- Najah National University.

The study of Hamarsheh and Nuairat (2011) aimed to identify the body mass index of students of An- Najah University and Al- Quds University of Abu Dis. The study of Al- Sheikhly, Awad and Awwad (2012) sought to identify the effect of the high- intensity interval training exercises in achieving a 400-meter race, and the effect of these exercises on some biochemical variables. The Zimek study (2012) aimed to draw a comparison between the effect of high intensity interval training and repetitive speed training on non- oxygenic fitness.

Kayed study (2013) sought to identify the effect of training (land- land water training) on the development of some physical variables (endurance, strength, speed, flexibility, and agility. Costigan et al conducted a study (2014) titled "Interval Intensity Training for the Development of Fitness- Related Health in Adults- Regular Review and Joint Analysis." The current study goes with previous Arab and international studies in terms of the goal, which is the effect of a proposed high- intensity training program on the body composition of males participating in fitness centers. The study is also in line with the Arab studies in terms of the environment in which it was conducted, which is the Palestinian environment.

This study contributes to designing a high- intensity training program and examines its impact on some physical, locomotive and body composition variables for males aged between 25- 35 participating in fitness centers across Palestine. The study provides important information about the use of this level of intensity on body composition, which itself has become a goal for subscribers of fitness centers. Furthermore, the study offers background information for researchers wishing to conduct similar research on high intensity training programs for different age groups and for both sexes. The current study took advantage of the previous studies in building the program and in concluding some recommendations, as the current study will cover a research gap between 2014 and 2020.

Statement of Problem

As trainers in fitness centers for many years, the researchers have noticed that new subscribers of these centers and who are above 25 years in agetend not to complete the general training programs. Through his contact with them and through discussions with his fellow coaches, the researchers found that the said age group was complaining about their failure to quickly achieve tangible results, and that they urgently need to save time to achieve their training goals of making a change in the components of their body composition.

According to Al- Basati Amrallah (1999), High- Intensity Trainings a training in which the intensity used by a player reaches 90 percent of their maximum ability. The volume of exercises must be up to the intensity used, and with incomplete breaks. Abu Al- Ula and Nasr Al- Din (2003) stated that that body composition is determined according to the mass of different weights and their percentage compared to the total weight of the body. There are two basic body components: body fat and lean body mass (LBM). As for the lean body mass, it refers to the other part of the body components (muscles, bones, etc) with the exclusion of the fat mass.

Therefore, they decided to prepare a training program based on a scientific basis, considering the time, physical abilities and the health status of the participants, as well as their hopes of achieving the desired goals.

The researchers would then review the results to benefit from them within the programs followed in the fitness centers. The researchers have therefore decided to conduct this study to explain the hypotheses that he put forward.

Study objectives

The study highlights the differences between a pre and post measurement of a proposed high-intensity training program, and its impact on the body composition of males between 25 and 35 years who are participating in fitness centers across Palestine.

Study hypotheses

The study aims to analyze the study main hypotheses which is:

There are statistically significant differences between the pre and post measurement of the impact of a proposed high- intensity training program on body composition (fat mass, muscle mass, water mass, and body mass index (BMI)). This is particularly important for males between 25 and 35 years who are participating in fitness centers across Palestine.

Relevant previous studies:

Al- Qaddumi and Issa (2004) conducted a study aimed at identifying the level of the maximum oxygen consumption (VO2max), and the body composition of male students in the Physical Education

Department at An- Najah National University. They also made comparisons of these variables according to academic level, and identified the relationship between the maximum oxygen consumption (VO2max) and the body composition of the male students in the said department. To achieve this, the study was conducted on a sample of 88 students from different academic levels.After collecting data using the step test of the University of California to measure VO2max, and after using the fat scale and the Balak and Jackson equation to determine the percentage of fat and muscle weight, the results of the study showed that the average maximum oxygen consumption reached 42.63 milliliters / kg / minute. The average percentage of fat reached 10.20%, and the average muscle weight (LBW) reached 67.066 kg.

The results also showed statistically significant differences in the maximum oxygen consumption and the fat percentage according to the academic level, which werehigher among thesenior students. Meanwhile, there were no statistically significant differences in muscle weight depending on the academic level variable. However, the results showed a statistically significant relationship at (0.01) between the maximum oxygen consumption (VO2max) and the body composition for male students in the Department of Physical Education at An- Najah National University.

This relationship was positive between VO2max and muscle weight (LBW), where the value of the Pearson correlation coefficient reached 0.82. Meanwhile, the relationship was negative between VO2max and the fat ratio, where the value of the correlation coefficient reached- 0.46. The relationship of the fat ratiovs muscle weightwas inverse and statistically insignificant. The two researchers recommended increasing the focus on oxygen exercise for students, especially the fresh.

Wanas (2008) conducted a study aimed at identifying the effect of high- intensity interval training on the development of speed endurance, and some physiological variables on international football referees of Iraq's Premier League. To achieve the objectives of the study, the study sample consisted of 16referees who were chosen randomly, 4 others were chosen for the experimental group, and 4 for the control group. The referees were homogeneous in some physiological and physical variables (like height, weight, age, speed endurance, pre- effort pulse, systolic and diastolic pressure). The researchers used the experimental approach with two equal groups for the purposes of the study. The training curriculum was applied for a period of six weeks at a rate of three units per week.

In developing the characteristic of speed endurance, the results showed statistically significant differences at the level of (0.05) for the pre and posttest of the experimental group, using the high intensity interval training method. There were also statistically significant differences at the level of (0.05) for the pre and posttest for the control group, which has physiological effects in developing the characteristic of speed endurance. In testing the blood pressure of the systolic and diastolic pressure variable during break time, statistically significant differences also appeared at the significance level (0.05) for the pre and post test of the two experimental and control groups. The results also showed that the value of T in measuring the difference between the pre and post tests was of significant evidence and in

favor of the experimental group. The researchers also recommended the adoption of a high intensity interval training method when training international football referees.

Ziyad Zayed (2010) conducted a study aimed at identifying the relationship of body mass index in some elements of physical fitness and the maximum oxygen consumption. The following variables were used: Speed, explosive power, agility, and the maximum oxygen consumption (VO2 max). Thirty students at the College of Physical Education at King Saud University participated in this correlational study, and the measurements were conducted to them through the use of body mass index. The following measures were then conducted: Running a distance of 50 meters, a stable vertical jump, the Illinois agility test, and the Cooper test to estimate the maximum oxygen consumption (VO2 max).

The SPSS statistical packages program, the single- variance analysis, the binary linear regression analysis, and the multiple linear regression analysis were carried out. The study results showed a statistically significant predictive relationship between body mass index and fitness, and also a predictive relationship between body mass index and the maximum oxygen consumption. Meanwhile, there was no predictive relationship between the body mass index and the speed component, as well as the explosive force component. The study recommended using BMI to predict some elements of physical fitness and the maximum oxygen consumption and conducting more studies on other societies and sports.

Al- Qaddoumi and Al- Taher (2010) conducted a study aimed at building standard levels of body mass index, body surface area, ideal weight, waist and pelvic perimeter ratio, and metabolism during rest timefor students of Birzeit University. The researchers also determined the relationship between these variables and the obesity rate among the students. To achieve this, the study was conducted on a sample of 421 male and female students, using the following factors: average age, height, weight, body surface area, body mass index, ideal weight, waist circumference to pelvic circumference ratio, and metabolism during rest time. The researchers recommended building standards for such measurements for students in Palestinian universities.

Shaker and Al- Atrash (2011) conducted a study to identify the levels of measurements of body composition and metabolism during rest among players of team and individual games at An- Najah National University. To achieve this, the study was conducted on a sample of 32 players of team games, and 16 players of individual games. The study variables were measured using the Tanta 410 device (Tanta- TBF) available at the Sports Measurement Laboratory at the College of Physical Education at An-Najah National University. The study showed statistically significant differences between players of team games and individual games in the variables of body mass index and fat rate and in favor of team games. Meanwhile, no differences were found in other variables (metabolism during rest, fat mass, fat- free mass and water mass).

Hamarsheh and Nuairat (2011) conducted a study to identify the body mass index of the students of An- Najah University and Al- Quds University of Abu Dis. To achieve the objectives of the study, it was

conducted on a sample of 1500 students from the faculties of Arts, Sciences, Engineering, and Economics at An- Najah National University, and 900 students from the faculties of Engineering, Arts and Sciences at Al- Quds University. The results showed that the average body mass of students in general was good according to international standards, and that no statistically significant differences were found in the body mass index for the students of both An- Najah National University andAl- Quds University of Abu Dis.

Al- Sheikhly, Awad and Awwad (2012) conducted a study to identify the effect of the high- intensity interval training exercises in achieving a 400- meter race, as well as the effect of these exercises on some biochemical variables. The sample consisted of nine runners aged 20- 22 years from the Anbar University team who engaged in a 400- meter race. The exercises lasted for 12 weeks with two units performed per week. The training units included special exercises to withstand the speed of performance. The exercises varied in terms of size, intensity, progression, and the average training age. After performing the post- tests that were similar to the pre- tests, the researchers used the experimental method and the Statistical Package for the Social Sciences (SPSS).

The results showed that the use of training curricula has a special importance in achieving records in the effectiveness of the 400- meter run. The results also showed that the use of speed endurance exercises increases the energy reserve within the muscles (ATB- PC). Further, the results showed that the use of speed endurance exercises creates ionic balance between positively charged ions and negatively charged ions, which maintains the balance of the internal environment of the body.In addition, it turned out that the use of speed- endurance exercises increases the efficiency of the cardiovascular system and strengthen the immune system. The researchers recommended that trainers and specialists pay attention to the 400- meter runand conduct periodic laboratory (biochemical) tests for runners in order to develop physical capacity.

Zimek (2012) conducted a study to drawa comparison between the effect of high- intensity interval training and repetitive speed training on non- oxygenic fitness. The researchers used the experimental approach on a sample of 31 players who were divided into three groups, and who underwent a six- week training program. The first group worked with high- intensity interval training, the second group worked with repetitive training, while the third group was the control group.The results of the study showed a great improvement among the players of the special endurance interval training, and that the players outperformed the second group. However, no change was noticed in the third group (control). The results also showed a similar improvement in the two groups (interval and repetitive) in general oxygenic fitness.

Kayed (2013) conducted a study to identify the effect of training (land–land- water training) on the development of physical variables (endurance, strength, speed, flexibility, and agility), and on body composition variables (body mass, body mass index, body fat mass, fat- free body mass, and body water

mass) for male participants in fitness centers for the 35- 45 year- old age group. The study sample consisted of 20male participants, and the researcher used some physical tests from the European Battery (Euro Fit Fitness Test 1988 Battery) to measure the physical variables. The researcher used the Tanita-TB410 device to measure body composition. The results showed an improvement on all variables and the absence of any statistically significant differences at the level of significance (0.05- a) in the post measurement of all the study variables. The researcher recommended the use of "water land training" for its positive effect on some physical variables and body composition.

Costigan et al (2014) conducted a study titled "Intermittent Intense Training for Health- Related Fitness Development in Adults- Regular Review and Joint Analysis" which aimed to evaluate the benefit of intermittent high- intensity training for health- related development of fitness in adults. The study aimed at identifying the effect of underlying training modalities as they are highly desired for testing adolescents aged 13- 18 years. These training modalities can also generate health- specific fitness outcomes and can last for periods of more than four weeks. They include an intensive intermediate comparison group and high- intensity activity for conditions of interval high- intensity training.

The combined analysis method was used to determine the components of the effect of interval intense training for the development of fitness- related health in adults, using this analysis and the possible media. These media include the study period, severity of deviation and type of comparison group. The results showed that the fitness of the heart, respiratory system and body parts were high and medium respectively. They also showed that the study period was a mediating effect of the intense interval training on health- related adult fitness development, as far as body fat is concerned. The effects of waist and muscle fitness conditions were not statistically significant. The results showed that intense interval training is an appropriate and time- effective method for health- related adult fitness development, and for improving cardio respiratory and body fitness in adult communities.

Method and Procedures

Study Approach:

The two researchers used the experimental approach for the pre and post measurements to measure the body composition variables (fat mass, muscle mass, water mass, and body mass index (BMI) due to its suitability for the purposes of the study.

Participants

The study population consisted of all the approximately 520 male participants from 25 to 35 years of age who participated in the fitness centers in the north of Palestine in January and February 2019. The participants were distributed over 30 centers registered with the Higher Council for Youth and Sports, collected through the tax file registration records of fitness centers in Palestine.

Study sample:

The study was conducted on a sample of 48 male participants aged 25- 35 years participating in fitness centers in Palestine. Tables No. 1 and 2 show the characteristics of the study sample.

Table (1) Characteristics of the study sample (age, weight, and height) (N = 48)

Variable	Measurement unit	Average	Standard deviation	Least value	Highest value
Age	Year	32.0	5.78	17.0	39.0
Weight	Kg	83.9	15.8	61.0	108.0
Height	M	172.47	6.43	160.0	182.0

Table No (2) Characteristics of the study sample for measurements of body composition (N = 48)

Variable	Measurement unit	Average	Standard deviation	Least value	Highest value
Fat mass	Kg	19.8	6.73	7.60	34.90
Muscle mass	Kg	38.9	2.96	32.10	40.10
Water mass	Kg	55.0	4.63	44.70	63.50
Body Mass Index (BMI)	Kg / m2	12.6	1.25	10.70	15.50

Study tools:

To achieve the objectives of the study, the two researchers used the following tools:

Sports mattresses.

Colored cones.

Packed dumbbells / 1 kg

A stick (bar) of 2 kg

Stopwatch

Cones

Meter

Skyland spin bike

Earphone

Tanta device (545) TANTA RD

Scale with a Rasterometer (DETECTO)

Whistle

Scientific conditions for the tests:

The devices used in the body composition measurement process include the TANTA (545), a scale with a stereo meter (type: DETECTO), a CD and a highly credible headphone.

Study procedures:

A work team consisting of two researchers and 12 assistants who hold a bachelor's and master's degree from the faculties of Physical Education at Palestinian universities have been identified. The researchers and the 12 assistants are involved in training in five fitness centers across Palestine (Appendix No. 2), and have been trained in advance before performing the measurement. The centers were rented after taking the necessary approvals, after distributing the personal questionnaires, selecting the appropriate sample, and setting the dates for the training. The spatial limit of the study are Sports Club / Land Gym- Nablus / Green Gym Club- Ramallah / and Future Club- Hebron, the study time limit: is January 25 until November 25 2019and the human limit is Male subscribers of fitness centers between 25- 35 in age in Palestine, who signed up in January and February 2019.

The measurement process was done as follows:

1- Personal data:
2- Presenting the exams and the program to specialized arbitrators to express their opinion. The presentation has been amended to take its final form.
3- The exploratory experience: The variables were all tested first (Appendix No. () based on the experimental sample. The program was then applied following the modifications by the competent arbitrators on a sample consisting of 3 players, aimed to identify the difficulties that may face the application of the program and overcome them. The participants in the experimental sample of the study were then excluded.
4- Measuring previous variables related to body composition (fat mass, muscle mass, water mass, and BMI).
5- Application of the program by performing high intensity exercises. The program was designed in its final form(see Annex No. ().
6- Measuring the previous dimensional variables related to body composition (fat mass, muscle mass, water mass, and BMI) after 8 weeks of applying the training program.

Study variables:

This study included the following variables:

A. Independent variables: They include high intensity exercises represented in the responses of the sample through the application of the content of the proposed training program.
B. Dependent variables: They include the following variables:

1- The sample's response to measurements related to body composition (fat mass, muscle mass, water mass, and BMI).

Statistical processes

In order to process the data, the two researchers used the Statistical Package for Social Sciences (SPSS) program, by using the following statistical formulas:

- Arithmetic means and standard deviations for age, weight, and height, and measurements related to body composition (fat mass, muscle mass, water mass, and BMI).
- Paired- t- test to determine the differences between the pre and post measurement and the percentage of change to verify the hypothesis.

Results related to the following hypothesis

which is : There are statistically significant differences between the pre and post measurement of the impact of a proposed high- intensity training program on body composition (fat mass, muscle mass, water mass, and body mass index (BMI)) among males aged 25- 35 years who are participating in fitness centers in Palestine.

To answer the hypothesis, a paired- t- test was conducted, as shown by the results of Table 3.

Table No. (3) Paired- t- test showing the differences between the pre and post measurement of the impact of a proposed high- intensity training program on body composition (fat mass, muscle mass, water mass, and BMI)

Variable	Pre measurement		Post measurement		T Value	Indication level	Amount of change	Percentage %change
Fat mass	Average	Deviation	Average	Deviation				
Muscle mass	19.8	6.73	19.5	6.74	7.582	*0.000	0.3	1.5
Water mass	38.9	2.96	40.1	4.41	-1.842-	0.072	- 1.1	2.8
Body Mass Index (BMI)	55.0	4.63	54.8	4.65	4.526	*0.000	0.2	3.6
	12.6	1.25	12.3	1.17	8.269	*0.000	0.3	23.8

Statistically significant at the level of significance (= 0.05).

Table (3) shows that there are statistically significant differences at the level of significance (α = 0.05) between the pre and post measurements relating to body composition (fat mass and BMI) among male participants in fitness centers in Palestine. The differences were in favor of the post measurement, where the significance levels reached (0.000 and 0.000) respectively, which are less than (0.05). The

percentages of change in these measurements reached 1.5 and 23.8 respectively. In contrast, there are statistically significant differences at the level of significance (α = 0.05) between the pre and post measurements in the measurements related to body composition (water mass) among male participants in fitness centers in Palestine, where the significance level reached (0.000), which is less than (0.05).

As for the percentage change in this measurement, it reached 3.6 in favor of the pre-measurement. On the other hand, there are no statistically significant differences at the level of significance (α = 0.05) between the pre and post measurements in the measurements related to body composition (muscle mass) among male participants in the fitness centers in Palestine, where the significance level reached 0.072, which is greater than (0.05). The percentage change in this measurement was 2.8 in favor of the post measurement.

The study goes with the study of Kayed (2013), the study of Qaddumi and Issa (2005), the study of Hamarsheh and Nuairat (2011) and the study of Shaker and Al Atrash (2011), while it is in contrary with the study of Kayed in terms of the water mass; Kayed suggests a positive effect in the water mass. The results of the water mass came with a change rate of 3.6, although it is statistically significant with a percentage of (0.000) which is an inverse result. The researcher believes that with the increase in muscle weight, the percentage of water mass in the body should improve. The researchers attribute this result to the fact that the intensity of the exercise increases the amount of sweating and bodily secretions, to the level that the participants cannot make up for that. The study agrees with Kayed study (2013) and differs with Shaker and Al- Atrash (2011) regarding the muscle mass. The latter study, however, does not show any change in the fat mass, water mass, and fat- free mass. Our study is also in contrary with the study of Costigan et all (2014) regarding the effect of interval intense training on the development of fitness-related health in adults, and in the percentage of body fat. The conditions of waist and muscle fitness were not statistically significant although the high- intensity interval training was appropriate for the adults of the study sample.

The researchers attribute this to the fact that the first goal of the training program is to reduce the level of fat. The program achieved what it was designed for. The researchers believe that high- intensity training has significantly affected the body composition variables, as fat mass and BMI have decreased and muscle mass increased. They also believe that these changes came through harmony in intensity, comfort, time change, times of the rounds, training times and increased loads.

Conclusions:

In summary, this study emphasizes the importance of examining the effect of high intensity training program of on some physical and mobile variables and on body structure among males aged between 25- 35 years participating in physical fitness centers in Palestine.

The study result show statistically significant differences of the effect of a proposed high- intensity training program on the body composition of males (aged 25- 35 years) participating in fitness centers in Palestine. These differences include all variables except for the muscle mass variable, and are in favor of the post measurement. Meanwhile, the water mass variable is in favor of the pre- measurement.

While the results show that the best effect of a proposed high- intensity training program was on the body mass index (BMI), for males (25- 35 years old) participating in fitness centers in Palestine.

Practical applications

In light of the above results and conclusions, the two researchers recommend the following:

1- Adopting the proposed high- intensity training program to save time and achieve tangible results. The proposed training is ideal for body composition (fat mass and body mass index (BMI)) for males participating in fitness centers aged 25- 35 years in Palestine.
2- Encouraging researchers to conduct similar studies on high intensity training for different age groups and for both genders.
3- Defining specific objectives of the training in order to make adjustments to the high intensity training program.
4- Not using the proposed program in determining the goal of increasing the amount of water or muscle mass.

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