The Effect of Anaerobic Swimming Training Program on Body Fat, some Physiological Variables and 50 and 200m Freestyle Swimming Time

Mohammed Bny Melhim, Wisal Alrabadi, Mohamed AL-Aly, Mohammad Maqableh *

ABSTRACT

The aim of this study was to investigate the effect of Training Program on Body Fat, some physiological Variables and 50 and 200m freestyle swimming time, and performance in swimmers. fifteen female swimmers from Yarmouk university team were employed to participate in a training program which lasted for (6) week, (3) times a week for (1) hour. Measurement were taken pre and post training program for "heart rate pulse, Vital capacity, blood pressure, body fat, and performance. The result revealed that there was a significant improvement between pre and post in" heart rate pulse, Vital capacity, systolic blood pressure, body fat, and performance of (50m, 200m) freestyle swimming, the researcher recommend generalizing the use of the suggested training program of this study to improve the physiology and swimming performance parameters.

Keywords: swimming, Body Fat, some Variables, swimming team.

Introduction

Swimming is one of the most interesting sports that most of us are eager to Practice because of its healthy benefits. It helps improve the efficiency of the Respiratory and circulatory systems besides other functional systems. It also increases productivity, gives fitness, and Keeps one's Weight. In addition to its benefits on mental, psychological and spiritual aspects, it gives an atmosphere of entertainment, fun and happiness. Swimming is considered one of the individual sports that can be practiced at any age. Further, it is suitable for both males and females and motivates us to exercise (Bani Melhem, 2003).

Studying the physiological and morphological aspect of swimming is a vital issue to understand the athlete and to improve performance (Gabbet et al., 2007), and the basis on which the training process is built (Vlatko, 2008). In addition, it is an important indicator of the success of many athletes, considering performance and their success in the tournament based on a set of functional and morphological characteristics and physical style fitting (Wishaw et al., 2011). These aspects are also considered the foundation stone for the arrival of the swimmers to the highest levels of sports, since swimming has special requirements which differentiate it from other games. If these requirements are available, then they can give a greater opportunity to accommodate the sports and their arts.

The physiological measurement is an important factor which helps the coach to know the physiological status of the player through the results of physiological measurement which is not a goal in itself but a process aiming at evaluating the weaknesses, both for the athlete or for the program.

Problem of the study

Every sport activity at the present time has its own functional and physical requirements. Reaching a high-level in a particular sport activity largely depends of the development of these requirements that helps the progress of training programs and completions.

The female short and medial distance swimmer need certain properties to increase their aerobic abilities, since upgrading capacity leads to improve their achievements. Through their contact with and teaching and training

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Yarmouk University swimming team, through the researchers have noticed that the team low levels and fluctuating performance and capabilities. Further, their results were not satisfactory, especially in the University championships which were held recently. So the researchers decided to conduct a training program aiming at developing swimmers, functional and physical performance.

**Objectives of the study:**

The study aims to identify:

1. The effect of the anaerobic training program on some variables related to the Circulatory and Respiratory systems (vital capacity, blood pressure, and heart rate).
2. The effect of the suggested training program on body fat (humerus fat, Sub-scapula fat, abdominal fat, and femur fat).
3. The effect of the suggested training program on record time (50m and 200 m) freestyle swimming.

**Hypotheses of the study:**

1. There was a statically significant difference to the suggested swimming training program between some variables related to the circulatory and respiratory systems (vital capacity, blood pressure, and heart rate, body fat).
2. There was a statically significant difference in the effect of the suggested training program on the level time of (50m and 200m) free style swimming.

**Study Domains:**

- **Time domain:** The study was applied from 3/3/2013 to 14/4/2013.
- **Spatial domain:** The pool of the faculty of Physical Education at Yarmouk university.
- **Human domain:** the study was conducted on 15 female swimmers from Yarmouk University.

**Previous literature:**

Zahemanesh (et al., 2013) aimed to identify the effect exercises on the physical structure of elite female players at the University of Tehran. The study was conducted on a sample of (30) female players whose age ranged had between (20-25) have undergone aerobic swimming for (8) weeks (twice a week) for 60 minutes. The body fat was measured from the chest, abdomen, and femur before and after the application of the training program. The results showed that the body mass indicator and percentage of the body fat had decreased scientifically after applying the training program. The study also found that aerobic and anaerobic exercise contributed to reducing the percentage of fat in the female players body.

Azizimasouleh (et. Al., 2012) aimed to identify the effect of breathing exercises in swimming improving the performance of elite female swimmers in Azad University of Iran. The study was conduct on a sample of (24) female players divided into two groups: standards and experimental. The experimental group trained special breathing muscles exercises for four weeks by (3) training modules. The results showed an improvement in the performance of the experimental group by increasing the average speed and average time per meter. The study recommended using the respiratory muscles training to improve performance.

Nualnim (et al., 2012) studied the effect of swimming exercises on blood pressure and functions of circulatory system in elederly. The sample of the study consisted of 43 participants who trained for for (12) weeks. The measurement of the study consisted of 43 participants who trained for (12) weeks. The measurement of the study included blood pressure and blood variables which are "Cholesterol and Blood sugar." In addition to body compostion, the results showed a decrease in systolic blood pressure from 131 mm Hg to 122 mm gm, and a significant improvement on other physiological variable in favor of the experimental group.

Santhiago (et al., 2011) examined the effect of training for 14 weeks on the physiological, hormonal and psychological varaibles, and physiological variables, and the performance of elite female swimmer. The sample of the study consisted of (10) Olympics female players who had undergone training. The physiological variables were measured at 8:00 am. And 3:00 pm. During two days, by a special questionnaire. The performance of the players was measured by anaerobic test in swimming. The results of the study showed that testosterone levels were lower in the post-test, while the lack of the concentration of the lactic acid in this period. The study also showed a clear improvement in blood and physiological variables among its subjects.
Ismail G (et al., 2011) investigated the effect of a training program for eight weeks on the variables "blood pressure, heart rate, body composition and some physical abilities" among an elite male swimmer. The sample of the study consisted of (40) participants, whose ages ranged between (20-29) years. The tool of the study included physiological variables and some of the physical tests which are "blood pressure, heart rate, body weight, and fatty mass, flexibility, Push up, vertical jump, and swimming (200m)." The results showed a decrease in the percentage of body fat, and a significant improvement in speed, blood pressure and heartbeat. The results also revealed improvement in flexibility and vertical jump tests, but the results did not indicate significant difference between the variable of weight and fatty indicator.

Dejan (et al., 2011) looked upon the effect of a training program in swimming on body fat and bone growth in children. The sample of the study consisted of (58) male participants divided into two groups. The control group consisted of (28) male swimmer, who underwent training for (12) months 10 hours weekly. The proportion of bone mineral and fat mass was measured and the results showed a significant difference in body fat and fat mass was measured and the results showed a significant difference in body fat between the two groups, while the percentage of bone mineral and did not show any difference between the two groups.

Farahani (et al., 2010) studied the effect of anaerobic program in swimming for 10 months on high blood pressure in some people. The study was conducted on 40 persons whose ages were 33-48 years, underwent (water-air) training for (10) months of (3) training units for 55 minutes per unit. The results showed the arterial blood pressure reduced by (11.7%), while the results did not show changes in diastolic blood pressure or the difference due to the age variable.

Kay L. Cox (et al., 2010) aimed to compare the effect of training in swimming and walking on fitness, weight and fat of the body, glucose and insulin. The sample consisted of (116) participants divided into two groups: the first took part in swimming training for 6 months of (3) sessions per week, the second set for the same time but took part in walking training. The results showed a decrease in body weight, cholesterol and lipoprotein for both group. They also showed that the improvement in glucose and insulin is due to swimming, and the short-term program while the improvement in these variables is due to walking if the program lasts a long term.

Sideravicite (et al., 2006) examined the effect of endurance training in swimming on the physical structure vessel and aerobic capacity. The sample consisted of (19) female players aged (14-19 years). The measurements of the study included weight, height and skin fold caliper, an indicator of body mass, the percentage of fat in the blood, and the time level for swimming endurance. The female participants underwent a program of (14) weeks, two units of 45 minutes per week. The results showed a decrease in fat mass, and blood fat results did not show a significant difference between the two measurements.

Verongue and Robert (2005) tried to identify the effect of endurance training in swimming on blood pressure and some variable related to the two systems: circulatory and respiratory. The study sample consisted of 105 female players. Measurements of the study included blood pressure, blood plasma, and body fat. The result a reduction of body weight, waist fat, the percentage of fat, systolic blood pressure and vascular resistance. The results did not show a difference in the diastolic blood pressure variable.

Bani Melhem (2003) studied the effect of a suggested training program in swimming on some physiological and physical variables and on the level time for (400m) freestyle swimming. The sample of the study consisted of (9) male swimmer of Yarmouk University who underwent a training program for six weeks, four training modules weekly, and seventy-five minutes for the unit training. The measurements of of the study included, "heart rate, respiratory rate, systolic blood pressure, blood sugar percentage of hemoglobin, red blood cells, white blood cells, weight, fat areas, humerus Sub-scapula, and the abdomen". The results indicated a decrease in heart rate, systolic blood pressure, breathing rate and body fat among the sample, they also showed a clear improvement in the red and white blood cells, the percentage of hemoglobin, and an improvement on level time on (400m) freestyle swimming.

Many of the previous studies (Nualnim et al., 2012), (Santhiago et al., 2011), and (Webster et al., 2010) pointed to the positive benefits of the exercises for the body, where the body and its organs and systems adapt.
with these exercises which lead to obvious improvement through increasing its efficiency in work and improving its functionality (Abdul-Rahman, 2000). Regular training is considered the best way to improve heart functions and blood vessels and reduces the diseases that male members might catch (Erikssen et al., 1998) and (Paffenbarger & Hsieh, 1986) or females (Manson et al., 2002), as it is the right direction towards increasing aerobic fitness, and decreasing blood pressure, heart rate, peripheral resistance and arousal sambthatic (Jennings et al., 1986; Kingwell, 2000; Meredith et al., 1991; Shephard & Balady, 1999). The expert groups recommend that the time of the training module should not be less than 30 minutes most days of the week and should be exercised regularly and continuously in the training process (Canadian Physical Activity Guidelines, 2011).

The Procedure Of Study:

Method:
The researchers of this used the experimental approach using the pre- post measurement per experimental group.

Population:
The population of the study is all short and middle distance female swimmers who are studied at Yarmouk University.

Sample:
The sample was selected in an intentional way. It consisted of (15) female swimmers. Table 1 shows the characteristics of the sample.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Age</th>
<th>Height</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 meters</td>
<td>8</td>
<td>20.86 ± 1.07</td>
<td>163.86 ± 7.47</td>
<td>62.00 ± 8.08</td>
</tr>
<tr>
<td>200meters</td>
<td>7</td>
<td>21.14 ± 0.90</td>
<td>161.43 ± 8.40</td>
<td>61.14 ± 7.27</td>
</tr>
</tbody>
</table>

Variables of the study
First: The independent variable:
- The I.V: the suggested anaerobic training program.

Second: The dependent variable:
- Vital capacity.
- Blood pressure.
- Heart rate.
- Body fat.
- Time record (50 m) and (200 m) freestyle swimming.

The study Tests:
First: Physiological and Anthropometric Parameters
The way of measurement is in identified after consisting some references. The scientific studies consist of:
1. Heart Rate pulse: It was measured from the sitting position using a digital device (Digital Blood Pressure Monitor), the reading was takes twice, and the mean of the two readings was taken.
2. Blood Pressure: It was measured clinically using a digital device (Digital Blood Pressure Monitor), the systolic blood pressure and diastolic blood pressure reading were taken twice and the mean of the two readings was computed.
3. Vital Capacity: It was measured using Spirometer.
   - body fat: It was measured using (Jackson's calculator) for the following four areas:
     1. Back humerus.
     2. Bottom of the Sub-scapula.
     3. Abdominal above the ilium.

Second: Time record:
It was measured by calculating the time for the following tests:
- (50 m) freestyle swimming
- (200 m) freestyle swimming

Tools and devices of the study:
A. Seca medical balance to measure height and weight.
B. Stopwatch to measure the test (50m) and (200m) freestyle swimming.
C. Digital Blood Pressure Monitor to measure heart rate and blood pressure.
D. Skin-fold Caliper device.
E. Spirometer device to measure vital capacity.
F. Special swimming tools "pool, fins, a pool noodle, and the board."
G. Physiological and physical test registration form

The suggested training program

The training program was developed according to the following steps:

A. The goal to be achieved was defined in terms of the suggested training program.
B. Related studies and scientific references were studied.
C. The components of the initial program were specified.
D. The fields of the study were presented for experts and specialists in the fields of physiology, coaching, testing evaluation and swimming.
E. A pilot study was conducted. On a sample of five female players on 02/28/2013 in order to decide the appropriateness of the suggested program and tools in terms of intensity, time and size of the target group. After the application, the unsuitable exercises were excluded, and then the training modules constitute final form. (see Appendix No. (1).

Procedure of the study

- **Pre-measurement:** The pre-measurement was taken in the swimming pool of Yarmouk university on Sunday, 3/3/2013, before starting the suggested training program.
- **Application of the program:** The suggested training program was applied during 3/3-14/4/2013.
- **Post-measurement:** The post-measurement were taken after the completion of the application program in the same atmosphere on 14/04/2013, in the same way of pre-measurement.

After obtaining the data, the researchers scheduled and classified them to prepare for the statistical treatment.

**Statistical Treatment**

SPSS (Statistical Package for the social Science) was used to analyze the data as follows:
- Mean (M).
- Standard Deviation (SD).
- Paired Sample- Test.

**Discussing results related to first hypothesis:**

"There is significant difference in the suggested swimming training program on some variables related to the two systems circulatory and respiratory (vital capacity, blood pressure, heart rate, body fat)"

To test this hypothesis the Paired Sample t. Test was applied to detect differences between the two measurements pre- post tests showing the effect of the training program variables "vital capacity, blood pressure, and heart rate" as Table 2 illustrates.

Table (2): t. Test to detect difference between the two measurements pre- and post:
tests of the variables (vital capacity, blood pressure, heart rate, body fat).

<table>
<thead>
<tr>
<th>Variable</th>
<th>M ± SD</th>
<th>(t) Value</th>
<th>DF</th>
<th>Sig Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre VC</td>
<td>1.392 ± 1.96</td>
<td>-7.55</td>
<td>7</td>
<td>0.00</td>
</tr>
<tr>
<td>Post VC</td>
<td>1.528 ± 1.93</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre VC</td>
<td>1.710 ± 1.71</td>
<td>-4.82</td>
<td>6</td>
<td>0.003</td>
</tr>
<tr>
<td>Post VC</td>
<td>1.939 ± 1.20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre SBP</td>
<td>127.43 ± 10.33</td>
<td>5.20</td>
<td>7</td>
<td>0.002</td>
</tr>
<tr>
<td>Post SBP</td>
<td>120.00 ± 8.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre SBP</td>
<td>124.00 ± 6.86</td>
<td>4.22</td>
<td>6</td>
<td>0.005</td>
</tr>
<tr>
<td>Post SBP</td>
<td>117.14 ± 4.18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre DBP</td>
<td>74.71 ± 13.43</td>
<td>0.36</td>
<td>7</td>
<td>0.73</td>
</tr>
<tr>
<td>Post DBP</td>
<td>72.57 ± 4.96</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table (2) shows the following:

According to the variable "Vital capacity for (50m) female swimmers", the results showed a significant difference at the level of (0.05 ≥ α) between the two measurements pre and post in favor of post – test means which become (1.528) while it is in the pre-measurement (1.392), which indicates an effect swimmers. For program which increases the vital capacity to short distances of female swimmers. For (200m) female swimmers, the results also showed significant differences at the level of (0.05 ≥ α) between pre- post measurement which becomes (1.939) while it is (1.710). the pre-measurement and this indicates an effect of the training program on the vital capacity of middle distance female swimmers.

Concerning the "Systolic blood pressure of (50m) female swimmers" variable, the results showed a significant difference at level (0.05 ≥ α) between the two measurement pre and in favor of the post measurement, where SMA declined in the post measurement to become (120,000) while it was (127.43) in the pre-measurement. This indicates an effect of the anaerobic reduction program on systolic blood pressure of short distances female swimmers. With (200m) female swimmers the results also showed a significant difference at the level (0.05 ≥ α) between the two measurement pre and post as the (t) value of (t) (4.22) and the level (0.005). this indicates the effect of the training program on decreasing the systolic blood pressure among middle-distance female swimmers.

With regard to the "Diastolic blood pressure for (50m) female swimmers", the results showed no significant differences at the level of (0.05 ≥ α) between the pre- post measurement to become (72.57) while it was (74.71) in the pre-measurement. With respect to the heat rate for (50) female swimmers, the results indicated no significant differences at level (0.05 ≥ α) between the pre- post measurement in favor of the post measurement. The mean declined in the post- measurement to become (66.00) while it was (71.57) in the pre-measurement. For (200m) female swimmers, the results also showed a significant difference at the level (0.05 ≥ α) between the two measurement pre and post in favor of the post measurement where the mean declined to become (81.86) whereas it was (83.14) in the per measurement.

The researchers attributed the improvement in the two systems circulatory and respiratory to the suggested training program which increased and efficiency the of heart pulse. The heart pumped more blood in a small number of pulse. The increasing of blood pumping and venous return and lowering the excitability sympathetic nervous system led to breadth in the vessel diameter which caused a decline in resistance to blood vessel and a lower systolic blood pressure. the increase in vital capacity is due to the increase of the transmits a large volume of air a maximum inspiration increased significantly, reflected in the increase in the vital capacity of the sample in the post measurement. The result is consistent with Nualnim et al (2012) which showed a clear effect of swimming training on decreasing systolic blood pressure.
The results also showed an obvious improvement in the psychological variables related to the circulatory and respiratory systems in the experimental group. Santiago et al. (2001) study showed a clear improvement in the vessels variables with the members of the study. Ismail G.et al. (2011) also showed a decline in the blood pressure and Heart rate as a result of a regular swimming training for 8 weeks, Farahani et al. (2010). The results showed small changes in diastolic blood pressure (11.7%). Verongue and Robert (2005) showed that the effectiveness of swimming training in lowering systolic blood pressure and reducing vascular resistance, while the results did not show a difference on the variable diastolic blood pressure between the two measurement pre and post, and (Bani Melhem, 2003). The results indicated a decline in heart rate, systolic blood pressure and respiratory rate among the members of the sample as a result of regular swimming training.

Regarding to the variable "Humerus fat for (50 m) female swimmers," the results showed significant difference at level (0.05≥α) between the two measurements pre and post in favor of the post-measurements. The mean in post measurements (15.00) decreased to become, while it was (18.14) in the pre-measure which indicates of the training program on lowering humerus fats for the short distances. While in (200m) female swimmers, the results also showed a significant difference at the level (0.05≥α) between the two measurements pre and post in favor of post measurement. The mean in post measure decreased to (14.57) program in lowering humerus fats in middle distance female swimmers.

With respect to the variable "Sub-scapula fat for (50m) female swimmers," the results showed significant differences at the level (0.05≥α) between the two measurements declined to (13.29) while it was (15.71) in pre-measurements. This indicates an effect of the training program on lowering Sub-scapula fat in female swimmers. The results of the training program on lowering Sub-scapula fat in the female difference at the level (0.05≥α) between the two measurement in favor of post–measurement. The mean decline in post-measurements to (14.29), while it was (16.86) in the post measurement. This indicates an effect of the non – oxygen training in swimming on decreasing Sub-scapula fat in medium distance female swimmers.

Concerning to the variable "Abdominal fat (50) female swimmers", the results indicated significant differences at the level (0.05≥α) between the two measurements pre and post in favor of post measurements, the mean declined to (16.4) while it was (19.71) in post–measurement. This indicates the effect of the training program on decreasing abdominal fat to the short- distance female swimmers. In (200m) female swimmers, the results pre and post in favor of post-measurements. The mean decreased in the post measurement to (15.29) while it was (18.43) in pre-measurement. This indicates an effect of the training program on reducing abdominal fat at middle – distance female swimmers.

Regarding to the variable "Thigh fat for (50m) female swimmers", the results did not reveal significant difference at the level (0.05≥α) between the two measurements pre and post. The (t) value was (3.77) and significant differences at (0.009). This shows the lack of the effect of the training program on lowering thigh fat of short distance female swimmers. However for (200m) female swimmers, the results showed significant differences at the level (0.05≥α) between the pre and post measurements in favor of the post measurement. This indicates an effect of the training program on decreasing thigh fat of middle distance female swimmers.

The researchers think that decreasing thigh fat is due to moderate exercises involved in the training program which used fat as an energy source being this results in a decrease in the body fat in general and in humerus, the bottom of Sub-scapula, abdomen and thigh in particular.

When the muscles work continuously and intensively they requires a steady flow of glycogen to produce movement. When glycogen is consumed, the reserve fat stored in the body decomposes and provides us with an extra glycogen until quitting the exercise. This way decreases the amount of fat stored in the body and lowering its rate.

This result is consistant with Zahedmanesh et al. (2013) which showed decease in the body mass index and the percentage of body fat (chest, abdomen and thigh) which decreases obviously after the application of the swimming training program. It is concluded that the aerobic and anaerobic exercises contribute reducing the
percentage of body fat among the female players. (Nualnim et al., 2012). The results indicated a significant improvement in the physical structure as a result of swimming exercises. (Ismail G. et al., 2011) The result showed a significant effect of swimming exercises on lowering the percentage of body fat. (Dejan et al., 2011). Its results showed a significant difference in the body fat after a result of swimming exercises between the experimental and control groups in favor of the experimental group. (Kay L. Cox et al., 2010). Results revealed an improvement in body weight after swimming and walking exercises, Sideravicite et al., (2006). This study showed a decrease in the total fat mass in trainees (Verongue & Robert, 2005). The study of Bani Melhem (2003) showed a significant effect of swimming exercises on lowering weight and fat in "upper arm, abdomen and the board" in the members of the study.

Discussion of results related to the second hypothesis:

"There is a significant difference in the effect of the suggested training program on the level time of (50m and 200m) free style swimming".

To test this hypothesis an applied Paired Sample t. Test detected differences between the two measurements prior and subsequent to the training program at Digital pool (50 m, and 200 m) freestyle, Table 4 below illustrated the findings.

Table (3) shows:

Concerning to the variable "Swimming record time (50m) freestyle", the results showed a significant difference at the record (0.05>α) between the pre-post measures (t.= 3.30); significant is (0.016), the significant differences in favor of post of the record time. The mean for the post was (43.2) seconds, while the mean for the pre-measure was (48.1 seconds). The results also showed a significant difference at the record (0.05>α) to swimming record time (200m) freestyle between the pre-post tests in favor of post measurement, mean decreased in post measurement to (2.24) minute. Its post measurement (2.33 minutes), this shows an effect of the training program on improving the time record of Swimming medium 200 meter freestyle. The improvement that occurred is the result of improving the functional variable and heart work to pump blood to all parts of the body. The results also showed lowering the percentage of the body fat (its increasing will cripple the performance) the performance and time record mostly associated with functional variables and improvement in the reflected positively on the time (50m and 200m) freestyle.

Azizmasouleh et al (2012) showed a clear effect of breathing exercises in swimming on the average speed, average time per meter. The study recommended using breathing exercises to improve the time level. Ismail G et al. (2011) revealed a significant improvement of training on race (200m) swimming, and sideravicite et al. (2006) showed improvement in the time level of swimming endurance, aerobic capacity, also Bani Melhem (2003) indicated a clear improvement in the levels of the time of swimming (400m) freestyle in the members of the sample.

Conclusions:

1. Exercises played an active role on improving fitness of the two systems, respiratory and circulatory.

2. Swimming training has significant effect in reducing the percentage of fat in the body, especially in "upper arm , abdomen, the thigh under sub-scapula."

3. The suggested training program can be viewed as a method for improving time record (50 m and 200 m) freestyle swimming.

Recommendations

1. The responsible person, of the training programs at Yarmouk University, should pay more attention to the
measurement of the functional and physical variable among the players in the different periods of sports season in order to know the extent of progress that has occurred due to the exercises.

REFERENCES


The female swimming coaches at Yarmouk University should pay great attention to such programs for developing and improving the level and improving this sport.


The Effect of Anaerobic …
Mohammed Bdawy Bny Melhim et al


ارث برنامج تدريبي-لاهوائي مقترح في السباحة على نسبة الدهون في الجسم وبعض المتغيرات الفسيولوجية وزمن سباحة 50 و200م حرة
محمد بني ملحم، وصال الرياضي، محمد العلي، محمد المقابلة

ملخص
هدفت الدراسة التعرف إلى تأثير برنامج تدريبي-لاهوائي مقترح في السباحة على نسبة الدهون في الجسم وبعض المتغيرات الفسيولوجية وزمن سباحة 50 و200م حرة، وشاركت (15) لاعبة من فريق جامعة اليرموك في البرنامج التدريبي الذي احتوى (6) أسابيع تدريب، وواقع (3) مرات تدريب أسبوعياً ويزمن قدبر عادة واحدة للوحدة التدريبية، وأخذت قياسات الدراسة قبل وبعد تطبيق البرنامج وتضمنت: معدل ضرائت القلب، السعة الهوائية، ضغط الدم، وشحوم الجسم لمنطقه العضد، وأسفل لوح الظهر، والبطن، والذنبر، وكشفت النتائج عن وجود فروق ذات دلالة إحصائية وتحسن ملموس على متغيرات معدل ضرائت القلب، السعة الهوائية، ضغط الدم الالتحفيز، وشحوم الجسم، وأداء (50، و200م) سباحة حرة، ووصفي الباحثين بضرورة الاهتمام بالبرامج التدريبية في تطوير الجوانب الوظيفية والميزات الرفيعة للسناجن.

الكلمات الدالة: رياضة السباحة، شحوم الجسم، المتغيرات الفسيولوجية، فريق السباحة.