

## The effect of an aid in increasing the efficiency of the heart rate and achieving the 100-meter freestyle swimming

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### Abstract

The aim of the research is to know the effect of an aid in raising the efficiency of the heartbeat by increasing the resistance of the water against the body creeping forward and as a means of increasing the efficiency of the work of the arms and the extent of its effect on the length and frequency of the arm pull and the level of achievement in the 100m freestyle swimming event. For the purpose of achieving the goal of the research, the researcher chose (10) of those who learn to swim, ages (14-16) years, in a deliberate manner. They were divided into two groups, the first (5) swimmers as an experimental group, and the second (5) swimmers as a control group. Both groups performed the sections of the training curriculum prepared by their trainer in all its details, except that the experimental group used swimming paws as a resistance tool within the vocabulary of the daily training unit. The control group used the traditional training method according to the method prepared by the trainer. The researcher began conducting the test before and after the research period, which lasted for 12 weeks, with three training units per week. The results achieved were analyzed statistically for both groups, where the researcher found that the 100-meter swimming time had improved in both groups. However, the group that used swimming paws in training to develop the ability of the arms was the best in addition to raising the efficiency of the heart rate, in addition to a noticeable increase in the length of the pull for the control group, so the researcher recommended the introduction of auxiliary tools in training, including swimming paws (resistance) in arm strengthening exercises. Due to its impact on increasing heart rate efficiency and reaching the level of success in the 100-meter freestyle swimming.

**Keywords:** An aid, Efficiency, Freestyle Swimming.

## 1. Introduction

The use of assistive means in training has brought about a qualitative leap by determining the appropriate type of training for each stage of the race, especially bilateral and unilateral leg fins, resistance paws, rubber ropes, and other auxiliary tools and devices that work to increase resistance during training. Thus, developing the basic qualities required by each swimming event, a specific type of which is used in developing the speed of short races, which Muhammad Ali Al-Qat called (speed resistance training). Recently, there has been an increase in research and studies related to swimming with the aim of creating and innovating aids and training methods and knowing their impact on physical and functional qualities with the aim of achieving achievement. Through the application of natural laws to the body in motion, the work of the arms and legs plays a significant influence in performance speed in all Olympic activities, particularly swimming. In free swimming, the arm movements' speed changes depending on the event. The pulse rate is used to determine the level of intensity of the physical load from a physiological standpoint, as there is a direct relationship between the pulse rate (within certain limits) and the intensity of the physical load, as the load is of low intensity if the pulse rate is less than 130 V/min, When the heart rate increases more than 180 V/min, this load is considered the maximum intensity. The 100-meter freestyle swimming event is one of the activities that requires increasing the efficiency of performance, which leads to increasing the efficiency of the work of the heart, which is responsible for delivering oxygen to all parts of the body and getting rid of dioxide. Carbon The pulse rate varies depending on the athlete and the non-athlete, and it also differs from one athlete to another. based on the kind of exercise that is being done. By precisely and rhythmically controlling the length and frequency of the pulls, the arm movements' speed may be adjusted to fit the race distance. As previously mentioned, the significance of the study resides in determining how an auxiliary method might increase heart rate efficiency and the effort of the arms that propel the body forward, as well as how this affects performance in the 100-meter freestyle swimming event.

## 2. Research Problem

(Miyashita - 1975) found that “there is a positive correlation between the pulling force with the arms alone and the speed of the swimmer”. In addition to the use of aids of various forms such as swimming paws - rubber ropes - water currents - weights and others. This aimed to increase heart rate and arm muscle strength and produce a change in accordance with the objectives established to meet them. The swimmers' performance in the 100-meter freestyle swimming event was found to be inconsistent by the researcher, since their results fell well short of the expected distance. The problem with this discrepancy was the failure to use appropriate aids and the neglect of raising and measuring the functional efficiency of the swimmer's body's internal systems, including the heart, by raising the efficiency of the heartbeat and using it as a real indicator to determine the level of physical and functional swimming efficiency in a way that is compatible with the level of development in the time of the race distance, and the introduction of means Helping develop the work of the arms by increasing resistance to the movement of the arms.

### 3. Research objective

- Identifying the effect of training using swimming paws on the length and frequency of the pull in the 100-meter freestyle swimming
- Identifying the effect of training using swimming paws in raising the efficiency of the heart rate and the level of achievement in swimming (100 m) freestyle.

### 4. Research hypothesis

- 1- There are statistically significant differences in the development of the length of the pull and its frequency in the post-tests in favor of the experimental group in the 100-meter freestyle swimming.
- 2- There is a positive effect of swimming paws as a means of increasing resistance and thus increasing the efficiency of the heartbeat
- 3- There is a positive effect of using swimming paws on the level of achievement in the 100-meter freestyle swimming.

### 5. Methodologies for research and field operations

The researcher used the experimental method because it suits the nature of the problem.

Human field: A sample of Musayyib Club swimmers (14-16).

Time field: from (5/3/2021) to 5/6/2021).

Spatial field: Marina indoor swimming pool (Babil Governorate) (50 m).

#### 5.1. Community and sample Research

The research sample was chosen intentionally, and included (10) 100-meter freestyle swimmers, ages (14-16 years), representing (65.5%) of the original population of (15) swimmers. Based on the characteristics of the research sample, the researcher divided them into two groups, the first experimental and the second control, with (5) swimmers for each group. On the basis of the average times achieved and their standard deviations in the pre-test in 100-meter freestyle swimming in a random manner, the researcher took into account in selecting the research sample the homogeneity of the members of the two groups in the research test, as in Table (1).

Table (1) The value of the coefficient of variation and the results for the variables of height, age, and weight for the individuals in the research sample.

Variables	Mean	Std. Deviation	Coefficient of difference	Result
Length/Cm	176	1.247	0.756	Homogeneous
Age	16.07	0.184	1.41	Homogeneous
Weight	69.3	0.95	1.65	Homogeneous

#### 5.2. Research devices and tools

- Electronic stop watches.
- A work team.
- C – Swimming paws (resistant paws)
- A German-made resting heart rate monitor (Jumper type device).

#### 5.3. Field research procedures

##### 5.3.1. Pretests

The researcher worked with the working team helping to carry out the pre-tests on 3/5/2021 in the closed Marina Water City swimming pool at 10:30 in the morning, in the 100m freestyle event, measuring the heart rate at rest time, and recording all variables related to the research

in a notebook prepared for this purpose. Purpose. After (12) weeks had passed, which is the training period, the post-test was conducted for both groups of the research sample on 6/5/2021, and the times achieved were recorded and the same procedures were implemented when conducting the pre-tests.

### **5.3.2. Training curriculum using assistive means**

The researcher began using swimming paws (resistance paws), which were included in the training curriculum as a means of increasing the water resistance that the swimmer encounters during his forward crawl. The researcher relied on the opinions of experts and foreign sources in amending some paragraphs of the training curriculum prepared by the trainer of the research sample in terms of intensity and size, in a manner consistent with the nature of the sample and according to Appendix (1). Three training units per week were part of the 12-week training program. The training volume ranged from 1200 meters to 2100 meters at the conclusion of the eleventh week, at which point it started to decline in order to conduct the post-test for the research sample. The amount of work-related training With the exception of one paragraph, both groups applied the training curriculum's components, and the arms made up 14% of the overall training volume. It is that the experimental group used resistance paws in swimming as a training tool. It was implemented within a set of repetitions for training the arms, which consists of (400 m) in the form of a set of repetitions (2 x 8 x 25 m) or (8 x 50 m) in the free swimming method - arms only, and at an intensity of approximately or Higher than what the swimmer does during the test, meaning that the swimming speed strategy during the 100m freestyle swimming competitions changes between every 50m. Some student swimmers have a faster swimming speed for the first 50m than the other, and some have the same speed. These strategies also change during the performance of the final test and according to the physical ability of the participating swimmers. And the functionality in each pool's swimming pool, in general, the researcher recorded the time of each basin and then extracted its average and took it as a measure of the 50-meter speed as a training intensity. Therefore, the researcher obliged the research sample members to perform the same frequency as recorded in the pre-test and to emphasize the correct technique when performing strikes (arms and legs), and to maintain the straight, streamlined position of the body, in order to maintain a greater effect when performing the work. While the control group performed the same set of repetitions in terms of volume and intensity, but without using swimming paws and in the traditional method prepared by the coach, making sure to maintain correct performance during training. All exercises were carried out in the same pool, the same class, and by the same coach.

### **5.4. Statistical methods**

Statistical methods used to process the results of the research test.

- Arithmetic mean
- Standard deviation
- T-test: for corresponding samples.

## **6. Presentation, analysis and discussion of the results**

### **6.1. Presentation of results**

The following tables provide insight into the nature of the performance level of the research sample members in the 100-meter freestyle swimming test, as well as the degree of dispersion of its values from the average level of performance in that test (the standard deviation), which

aids the researcher in detection, diagnosis, and prediction. This will help the study reach its goal of understanding the impact of the training tool used (swimming paws).

Table (2) displays the outcomes, arithmetic means, and standard deviations for the experimental and control groups in the pull frequency variable for the 100-meter freestyle swim as well as for the pre- and post-tests.

Group	Pre		Post		f	f1	T Value		Sig Type
	Mean	Std. Deviation	Mean	Std. Deviation			Calculated T Value	Tabular Value	
Experimental	99.6	0.64	98.8	0.56	0.8	0.22	3.62	4.50	non Sig
Control	99.4	0,5	100.25	0.22	0,67	0,13	5.56		Sig

It is evident from Table (2) and the statistical treatments that there are statistically significant differences between the pre- and post-test results for the two research groups in the variable of pull frequency for a 100-meter freestyle swimming distance. The experimental group's calculated value of (t), which came out to be 3.62, was less than With four degrees of freedom and a significance level of 0.05, the tabular T value is 4.50. In contrast, we find that the value of (t) calculated for the control group was (5.56), which is greater than the value of the tabulated (T) of (4.50) under a degree of freedom (4) and a significance level of (0.05). This suggests that there was no development of the aforementioned variable in the post-test. Consequently, the post-test showed a substantial difference favouring the control group in this variable.

Table (3) Statistics results for comparison between the experimental and control research groups in the pull-response variable in the 100-meter freestyle post-test.

Group	Mean	Std. Deviation	Calculated T Value	Tabular Value	Sig Type
Experimental	98.8	0.56	4.46	2.26	Sig
Control	100.25	0.22			
Under a degree of freedom (8) and a significance level of 0.05					

The draw frequency variable's statistical outcomes for the experimental and control groups are displayed in table (3). The calculated t between the two groups was 4.46, which is higher than the tabular T of 2.26 under a degree of freedom of 8 and a level of significance of 0.05. The experimental group's mean was 98.8, with a standard deviation of 0.56, while the control group's mean was 100.25, with a standard deviation of 0.22. It shows that the frequency variable significantly differs between the two groups in favour of the control group. The researcher ascribed this to the experimental group's inability to affect it through the usage of swimming paws.

Table (4) The arithmetic mean, standard deviation, and the results of the pre- and post-test for the experimental and control groups in the variable length of the pull, 100 m freestyle.

Group	Pre		Post		F	F1	T Value		Sig Type
	Mean	Std. Deviation	Mean	Std. Deviation			Calculated T Value	Tabular Value	
Experimental	1.36	0.007	1.38	0.006	0.01	0.002	6.55	4.50	Sig
Control	1.357	0.006	1.357	0.006	0.003	0.0023	1.47		Non Sig

Table (4) indicates statistically significant differences between the pre- and post-test results for the two research groups regarding the length of the pull in the 100-meter freestyle swimming distance. The calculated value of (t) for the experimental group was (6.55), exceeding the tabular (T) value. The value is 4.50, with 4 degrees of freedom and a significance level of 0.05. This indicates that the aforementioned variable has developed in the post-test. The calculated value of (t) for the control group was (1.47), which is less than the tabulated (T) value of (4.50) at a degree of freedom (4) and a significance level of (0.05). The post-test results indicated a significant difference favouring the experimental group for this variable.

Table (5) The statistical results for the comparison between the experimental and control research groups regarding the pull length variable in the 100-meter freestyle post-test.

Group	Mean	Std. Deviation	Calculated T Value	Tabular Value	Sig Type
Experimental	1.38	0.006	6.88	2.21	Sig
Control	1.357	0.006			
Under a degree of freedom (8) and a significance level of 0.05					

Table 5 presents the statistical results for the draw length variable in both the experimental and control groups. The experimental group recorded an arithmetic mean of 1.38 and a standard deviation of 0.006, whereas the control group exhibited an arithmetic mean of 1.357 and a standard deviation of 0.006. Upon reaching. The computed t value for the two groups is 6.88, exceeding the critical t value of 2.21 at 8 degrees of freedom and a significance level of 0.05. This result indicates a significant difference in the variable of pull length, favouring one group over the other. The researcher attributed the experimental results to the effect of the swimming paws utilised by the experimental group.

Table (6): The arithmetic mean, standard deviation, and result for the pre- and post-tests and for the experimental and control groups in the 100-meter freestyle swimming time variable.

Table (6): The arithmetic mean, the standard deviation, and the results of the pre- and post-test for the experimental and control groups in the 100-meter freestyle swimming distance time variable.

Table (6) The arithmetic mean, standard deviation, and result for the pre- and post-tests and for the experimental and control groups

Group	Pre		Post		T Value		Sig Type
	Mean	Std. Deviation	Mean	Std. Deviation	Calculated T Value	Tabular Value	
Experimental	69,19	2,21	66,19	2,11	6,59	1,823	Sig
Control	69,20	2,33	68,75	2,67	10,76		Sig

Table (6) shows that there are statistically significant differences between the results of the pre- and post-tests in the two research groups for the 100-meter freestyle swimming time variable. The value of (t) calculated for the experimental and control groups reached (6.59) and (10.76), respectively, which are greater than the value (T) Tabular The amount is (1,823) under a degree of freedom (4) and a significance level (0.05). Which indicates that there has been a development of the aforementioned variable in the post-test for both groups, noting that there is a significant difference in favor of the experimental group, which indicates that there is a differential impact of the training methods used by the two groups of members of the research sample on this variable.

Table (7) Statistical results for the comparison between the experimental and control research groups in the 100-meter freestyle swimming time variable.

Group	Mean	Std. Deviation	Calculated T Value	Tabular Value	Sig Type
Experimental	66,19	2,11	1,71	1,680	Sig
Control	68,75	2,67			
Under a degree of freedom (8) and a significance level of 0.05					

Table (7): Statistical results for the experimental and control research groups in the 100 m freestyle swimming time variable. The experimental group achieved a mean (66.19) and a standard deviation (2.11), while the control group achieved a mean (68.75) and a standard deviation (2). 67), when the calculated t value between the two groups reached (1.71), which is greater than the tabular T value of (1.680) under a degree of freedom (8) and a significance level (0.05), which indicates that there is a significant difference between the two groups in the 100-meter freestyle swimming time variable, in favor of the experimental group, which the researcher attributed to the effect of the swimming paws used by the experimental group.

## 6.2. Results of measuring the pulse rate at rest

Table (8) shows the results of the tests on the pulse at rest for the experimental and control groups, the arithmetic mean, the standard deviation, and the calculated and tabulated T-value for the pre- and post-tests for the two groups.

Table (8) shows the results of the tests.

Group	Pre		Post		T Value		Sig Type
	Mean	Std. Deviation	Mean	Std. Deviation	Calculated T Value	Tabular Value	
Experimental	73.4	179	68	171.2	2.55	1.81	Sig
Control	73	175.3	72.4	174.1	1.46		Non Sig

Under a degree of freedom (8) and a significance level of 0.05

The experimental sample used the proposed auxiliary tool, while the control group performed the curriculum method. The results of the arithmetic mean and standard deviation for the experimental group in the pre-test were (73.4) (179) respectively, while in the post-test they were (68) (171.2) respectively and reached a value (T) Calculated to determine the significance of the differences between the pre- and post-tests (2.55), which is the largest of its tabulated value of (1.81) at a degree of freedom (8) with an error rate of (0.05). Which indicates that the difference was significant between the two tests and in favor of the post-test. The mean and standard deviation for the control group in the pre-test were (73) (175.3), respectively, while the mean and standard deviation for the same group in the post-test were (72.4) (174.1), respectively. The value of (t) calculated to determine the differences between the pre- and post-tests was (1.46), which is smaller than the value of the tabular (t) of (1.81) at a degree of freedom (8) with an error rate of (0.05). This means that there is no significant difference between the pre- and post-tests, which indicates However, the difference between them was random. For the purpose of knowing the significance of the differences between the two groups, the researcher calculated the significance of the differences for the arithmetic means and the standard deviations for the post-tests only for the experimental and control groups, as shown in Table (9).

Table (9): The arithmetic mean, standard deviation, and T value calculated in the post-tests for the two groups to measure the pulse at rest

Group	Post		T Value		Sig Type
	Mean	Std. Deviation	Calculated T Value	Tabular Value	
Experimental	68	171.2	1.82	1.81	Sig
Control	72.4	174.1			

Under a degree of freedom (8) and a significance level of 0.05

The value of the arithmetic mean for the experimental group was (70) with a standard deviation of (171.2), while the value of the arithmetic mean in the control group was (72.4) with a standard deviation of (171.1), and the calculated value of (t) was (1.82), which is greater than its tabulated value of (1.81) at a degree of freedom (8), which indicates that there are significant differences between the two groups and in favor of the experimental group.

### 6.3. Results of the 100 m freestyle swimming test

Through our observation of Tables (2) and (3), it appeared that there was a significant difference in the draw frequency variable in the pre- and post-tests, in favor of the control group, while no development occurred in the experimental group, which the researcher attributed to the effect of the training method, which had a clear effect on developing the ability to Swimming increases arm strength and thus its impact on performance, this is what Maglisho points out and stated (that there is an adaptation as a result of speed training in the presence of training aids). The researcher used the paws, which is one of the most commonly used swimming methods during training. Sareh Al-Fadhli divided these methods into (Issam Abdel Khaleq, 1999, p. 51):

- 1- Facilitating conditions (help) mean using aid to achieve speed.
- 2- Using the method of disability (resistance), that is, using resistance in training.
- 3- Swimming exercises using resistance in the water (Ali Ahmed Hadi, 2000, p. 27) and the tools used during training
- 4- Swimming while wearing clothes, carrying weights, or using a weighted dummy, swimming paws, fins, a foot raft, and a buoyancy board. These constitute resistance

during training for the swimmer as well. They take multiple forms, such as swimming while wearing a resistance band.

This is what was implemented during the exercises to develop the ability to work the arms within the vocabulary of the training curriculum prepared for each of them, which created a differentiated training adaptation that led to an improvement in performance time, because the training tool used (swimming paws) had an impact on the adaptation that occurred to the muscles of the arms, which led to Therefore, the experimental group's performance time improved at the expense of the draw frequency. Although there was no improvement in the frequency of the pull, the compensation for it was the increase in the length of the pull that occurred in the post-test. As (Kurt, 1988) indicates, swimming speed can be obtained when changing one of the speed variables (frequency or length of the pull), meaning improving the length. The pull while maintaining its frequency, as is the case with middle- and long-distance swimmers, or increasing the frequency of the pull while maintaining its length, as in short competitions. It is also noted in Tables (4) and (5) demonstrate a significant difference in the variable of pull length between the pre- and post-tests for the two groups. The researcher attributes this difference to the training methods employed, which evidently influenced the pull length variable, aligning with Pai's findings. According to Wilson (1984), speed is determined by the average length of the pull per minute required to cover a specific distance. According to Cappaert (J. 1997), a relationship exists between the length of the pull and the performance time required to cover a specific distance during resistance training methods. As resistance increased, the frequency of the pulls diminished while their duration extended. The researcher posits that the swimming palm enhanced arm muscular strength, thereby augmenting the muscles' capacity to generate greater speed for extended distance per arm pull, given that power is defined as the product of speed and muscular strength.

Analysis of Tables (6) and (7) indicates a statistically significant enhancement in the performance time variable for both the experimental and control groups in the pre- and post-tests, reflecting an improvement in achievement levels in the 100-meter freestyle swimming for both groups. The computed t-value for the two groups exceeded the tabulated t-value, indicating a significant effect of the training method employed in the implementation of the training curriculum items. The performance development in the experimental group was more pronounced than that in the control group. The researcher attributed this development to the influence of the swimming palm training method, which significantly impacted arm function and the strengthening of joint muscles, crucial for generating the driving forces that propel the body forward in free swimming. This is consistent with what (Miyashita-1975) pointed out, "that there is a high positive correlation between the force of pulling with the arms alone and swimming speed," and with what (Kunzelman-1980) stated, "that reaching the maximum capacity for propulsion in the water is achieved by pushing a large amount from the water for the longest possible distance. This was achieved by increasing the length of the arm pull and the strength of the arm movements. The researcher found that the increase in loading achieved through the use of swimming paws achieved the goal of its use. This explained the reason for the development of the level of performance of the arms as a result of the loading for the experimental group, by increasing the resistance they face. With the swimming palm compared to the load in the control group.

#### **6.4. Results of measuring the resting pulse rate**

Tables (8) and (9) show the results of measuring the pulse rate at rest. The results of the tables showed statistically significant differences between the pre- and post-tests, in favor of the post-test. The researcher attributed the reason for this to the sample's response to the proposed tool in developing the functional variable (Samira Muhammad Orabi, 2017, p. 145). The results actually indicated a clear development in the heart rate, and the most important development

that occurred was a decrease in a small percentage of the pulse rate of the research sample at rest, and a return to rapid recovery, which indicates the development of the respiratory system. In addition, the rate of development in the pulse rate helped increase the volume of blood pushed to the working muscles along with the percentage of oxygen required to perform physical effort without fatigue.

(Mahmoud Al-Mashhadani, 1976, p. 107) pointed out that there are several things that happen when the circulatory system develops at rest, including:

- 1- Changes in heart size.
- 2- Decrease in heart rate.
- 3- Increase in stroke volume.
- 4- An increase in the amount of blood and hemoglobin

(Devriz) pointed out that regular training works to adapt the heart to the effort, which leads to a lower heart rate during rest or when given different loads compared to people who do not exercise regularly, and the reason for this is due to the stroke volume. ) And the temperature increases between one hit and another.

(Sperryn) confirmed this by saying that the heart adapts during rest and during effort quickly returning to its normal state, and this is clearly evident among athletes who practice endurance and table sports.

## 7. Conclusions and recommendations

### 7.1. Conclusions

- Training with assistive devices, such as swimming paws, is one of the appropriate training methods for increasing resistance in the water environment, and it also leads to increasing the efficiency of the muscular strength of the arms and thus increasing the length of the arm sweep in 100-meter freestyle swimming events.
- There was no effect of the swimming paws on the drag frequency variable between the results of the experimental and control groups in the post-test.
- A difference appeared between the results of the experimental and control group in the post-test in the 100-meter freestyle swimming time, in favor of the experimental group.
- A difference appeared between the results of the experimental and control group in measuring the post heart rate, in favor of the experimental group.

### 7.2. Recommendations

- Giving importance to swimming paws in training the arms when developing training programs because of their direct impact on raising the level of achievement.
- Instruction on using swimming paws as a training method to strengthen the arm muscles and because of their importance in developing the level of achievement in the 100-meter freestyle swimming event.
- Auxiliary tools must be used in training, especially arena paws, because they are important in raising the body's functional efficiency, especially the heart rate indicator.

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## Appendix

A model of training units for a training week for swimmers' training for ages 14-16 years

<b>Sunday</b>		
<b>Curriculum Content And Objective</b>	<b>Organization</b>	<b>Training Method</b>
Warm up	200m freestyle + 100m pull + 4x50m	Continuous swimming time: 10 minutes - heart rate 120-150 beats/minute
Endurance swimming	4 x 100m (25m right + 25m left) arm pull + 50m swimming	Interval – 2 minutes (work + rest) 75% intensity
Lactate production exercises	6 x 50 + 50m light swimming between each repetition	Repeat 90 seconds (Work + rest) intensity up to 90%
Bearing swimming is a topical basis	4 x 100m, two men only	2.5 minute interval (work + rest) 75% intensity
Overload exercises	(8 x 50 m) using the swimmer's paws in the experimental group	Maximum intensity 90 seconds (rest + work) Maximum intensity
Recovery	200m gentle downhill swimming	Continuous swimming, 3 minutes, light intensity
Size	1000m	
<b>Tuesday</b>		
<b>Curriculum Content And Objective</b>	<b>Organization</b>	<b>Training Method</b>
Warm up	200m freestyle + 100 pull up)	Continuous swimming time: 12 minutes, pulse up to 150
Endurance swimming	8 x 50m (25m right + 25m left) double arm pull	Interval – 90 seconds (work + rest), 75% intensity
Capacity development exercises	2 (8 x 25 m) using swimming paws. Experimental group	Maximum intensity 80 seconds (work + rest) Maximum intensity
Bearing swimming is a topical basis	4 x 100m, two men only	2.5 minutes (work + rest), 75% intensity
Anaerobic threshold training	3 x 100m	90 seconds of repetition (work + rest) submaximal intensity
Recovery	2 x 100m increments (increasing the time to cover the distance for each repetition)	8 minutes, light intensity
Size	500m	
<b>Thursday</b>		
<b>Curriculum Content And Objective</b>	<b>Organization</b>	<b>Training Method</b>
Warm up	150m (50m freestyle + 50m backstroke + 50m breaststroke)	Continuous swimming time: 12 minutes, pulse up to 150
Endurance swimming	4 x 100m (25m) arm pull + 75m full swim	Interval – 2 minutes (work + rest) 75% intensity
Lactate production exercises	3 (6 x 25 m) freestyle	90 seconds (work + rest) + 3 dBm, intensity 90%
Bearing swimming is a topical basis	4 x 100m, two men only	2.5 minutes (work + rest), 75% intensity
Overload exercises	(4 x 50 m) Using the swimmer's paws. Experimental m	Maximum intensity 90 seconds (rest + work) Maximum intensity
Recovery	200 m gentle downhill swimming	Continuous swimming time 8 min
Size	1500m	