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The effect of exercises (weights, rubber ropes) on the development of physical abilities, movement and improvement of achievement in swimming (50) m freestyle for youth

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Abstract

The study aimed to prepare exercises (weights, rubber ropes) in developing the physical and mobility abilities of young swimmers and improving their achievement in swimming (50) meters freestyle. For achieving this aim the researchers use the experimental procedure (equipotent groups) to fit the problem, and the research identifies the youth swimmers for (50) m freestyle in the clubs of Najaf who are (8) swimmers. For the purposes of the research experiment, (6) swimmers were randomly selected, and by (3) swimmers for each of the first experimental research groups (weights) and the second experimental (rubber ropes). Each swimmer has 7 attempts and a total of (21) attempts for each group, and after completing the tests process for the research variables, which is extracting the results and treating them statistically, from which the researchers reached some conclusions, including:

1- Both weight training and rubber ropes positively affected the development of physical and movement abilities and achievement in the 50 m freestyle swimming for young swimmers.

2- Weight training came with the best influence in developing the explosive ability of the two legs, and the least improvement in the rubber rope exercises.

3- The rubber rope exercises showed a preference in impact to develop (the strength distinguished by the speed of the two legs, and the distinctive strength of the speed of the arms, agility) and to improve the achievement of youth in swimming (50) meters freestyle compared to their achievement with weight training.

Keywords: (weights, rubber bands, abilities, achievement (50) m freestyle)

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Introduction

One of the advantages of swimming is that it differs from other sports and that it has a content in an aqueous medium as this medium used to move and the motor performance of both arms and legs and the rest of the body parts performed by swimmers is done. One of the activities of free swimming is the swimming of (50) m freestyle. It is enjoyable and valuable swimming for both the audience and the players. It depends on the speed of the swimmer with the accuracy of the performance, as it is the first point of his start until he reaches the end. The swimming of (50) m freestyle, which deals with the parts of the seconds in the achievement, hence, the interaction with it in the preparation exercises for swimmers including young people, will be difficult.

This matter requires from the trainers to use the best training methods and styles, and by using auxiliary means and tools for reaching high achievement, especially if we know that the search for these exercises within the aqueous medium, which will be fins, paws, weights .... etc., and some other exercises are done by using weights and rubber bands, and this is the point of our work in this research.

Whereas the lack of cognition in recognizing any of the exercises is more beneficial and has a greater impact on the physical and motor abilities of the swimmer as well as his achievement. Really, a problem requires careful studying through practicing these exercises outside the aqueous environment, since most of the exercises are in the water and it is a harmless experience. Through it, the researcher will discover a new learning that he will use the trainers in performing their work in the future as well as swimmers to reach the best results. That is why this study is so important, especially if we know that this attempt is serious in developing appropriate solutions for what the research needs. There are many studies that preceded us and if we could not find it, hence, our studies are a continuation of the previous one or a qualitative addition to it, through which the actual reality of the exercises outside the aqueous environment will be discovered using auxiliary tools, including weights and rubber ropes.

There is no solution to the research problem except through achieving the following goals:

1- Identifying the effect of weight training on developing physical and motor abilities and improving the achievement of young swimmers in an activity of (50) m freestyle.

2- Identifying the effect of rubber rope exercises on developing physical and motor abilities and improving the achievement of young swimmers in an activity of (50) m freestyle.

3- Identify the preference for weight training or rubber bands in the development of physical and movement capabilities and improve the achievement of young swimmers in the event of (50) m freestyle.

Research Methodology (Research Topic)

In order to achieve the objectives of the research, the researchers did the following:

1- Choosing the appropriate research method, namely the experimental method (equivalent groups), due to its suitability for such a study.

2- The research community was identified by young swimmers who concerned with the activity of (50) meters freestyle in the province of Al-Najaf. They are (8) swimmers, from whom (6) swimmers were selected, and randomly assigned to each group (3) swimmers, each of whom was given (7) experimental attempts, (21) attempts were made for each group, and from its results, the two groups were homogeneous and equal.

3- For the purpose of determining the physical and movement capabilities involved in the research and their tests, references and studies related to the relevant research were reviewed and consulted with the opinion of experts and specialists, the following capabilities were reached:

Table (1): Shows physical and motor abilities and appropriate tests to measure them

S	Tests of Bio-kinetics Abilities	Measurement Unit	Tests
1	The explosive power of the legs	Cm	The long jump of stability
2	Distinguished strength at the speed of the Legs	Cm	The long jump forward for 10 seconds
3	Distinguished strength at the speed of the arms	Times	Bending and extending the arms from the front support position, the maximum number of (10) seconds
4	Agility	Seconds	Zigzag running among barriers (with numbers)

4- Determining the validity of the tests concerned with measuring the capabilities studied, the suitability of the exercises for the capabilities of the members of the two research groups, as well as the time it takes for each exercise. The researchers conducted an exploratory experiment on (5) swimmers for the period from 15-20/12/2109 on the playgrounds and swimming pools of Najaf Water City and its results were reassuring of its suitability and suitability for the testers.

5- During the period from 25-27/12/2019, the pre-measurement was carried out on the application of the tests for the researched abilities and the achievement of (50) freestyle swimming on the two research groups with (7) attempts for each swimmer, for (21) attempts for single group. All this was done on the playgrounds and swimming pools of the water city in Najaf, and from the results of this measurement and before conducting the experiment concerned with the research, two processes of homogeneity and equivalence of the two research groups were conducted in the researched variables. So test (F) was used for homogeneity and test (T) for equivalence.

Table (2): Shows the statistical estimates of the investigated variables and the members of the two research groups to express their coherence and equivalence

Variables	Weight Experiment			Rubber Ropes Experiment			(F) Value Homogeneity*	(T) Value Equivalent*	Statistical Significance
	Mean	SD	SE	Mean	SD	SE			
The explosive power of the legs	2.07	0.11	0.040	2.07	0.18	0.04	1.00	0.077	Non Sig.
Distinguished	29.11	.141	0.21	29.89	1.24	0.27	1.74	0.652	Non Sig.

strength at the speed of the Legs									
Distinguished strength at the speed of the arms	13.29	1.25	0.27	13.33	1.15	0.22	1.18	0.385	Non Sig.
Agility	11.22	0.99	0.23	19.16	1.41	0.31	2.02	0.433	Non Sig.
Achievement	16.21	0.856	0.12	32.20	0.54	0.12	1.07	0.280	Non Sig.

* The tabular value (f) is (2.244) at the significance level (0.05) and the degree of freedom (20, 20).

* The tabular value (t) is (2.021) at the significance level (0.05) and the degree of freedom (40).

6- Once the researchers made sure of the homogeneity and parity of the two groups, they began to apply the exercises using auxiliary tools, including weights for the first group, and rubber ropes for the second group as training methods. The training methods identified as that all exciting possibilities that the trainer uses that works to convey theoretical and practical information to the player and clarify it to reach the goal with the least effort and the fastest time' (1: 67). In that regard, they took into account the training time, intensity used and training methods, especially high intensity interval training and repetitive training, as they started applying the training modules on 1/5/2020 for a period of (8) weeks and with three weekly units, so their total became (24) training units.

7- Thus, after the researchers completed their training program, they started the telemetry on 5/3/2020 until 3/7/2020, as the final test was conducted on the members of the two research groups in the playgrounds and swimming pools of the water city in Najaf, taking into account the conditions and instructions for carrying out these tests under the same available circumstances and capabilities used in the pre-measurement.

8- The following statistical methods were used in analyzing the data and their results (3: 149) (F and T-tests used for independent samples once and correlated at another, arithmetic mean, standard deviation, standard error).

Results and Discussion

For the purpose of showing what has been achieved from the research objectives, the results must be presented and analyzed according to those objectives.

1- The effect of weight training on developing physical and motor abilities and improving swimming achievement (50m) for youth.

Table (3): Shows the statistical estimates for research variables and diversity between them at both pre and post measurements (Weights)

Variables	Pretest		Posttest		(t) value*	Statistical Significance
	Mean	SD	Mean	SD		
The explosive	2.07	0.18	2.47	0.17	7.84	Sig.

power of the legs						
Distinguished strength at the speed of the Legs	29.61	0.94	32.08	1.01	51.27	Sig.
Distinguished strength at the speed of the arms	13.19	1.25	15.19	0.93	7.48	Sig.
Agility	11.84	0.99	9.49	1.41	19.59	Sig.
Achievement	32.21	0.56	29.51	0.56	102.16	Sig.

* The tabular value (t) is (1.725) at the significance level (0.05) and the degree of freedom (20).

It is noted from Table (3) that all the research variables in terms of abilities and achievement have improved their performance in the post-measurement than they were in the pre-measurement, so the value of the arithmetic mean of the explosive power of the two legs in the pre-measurement was (2.07), its value at the post-measurement became (2.47). The purpose here is clear, as well as the standard deviation at the same power and respectively (0.18, 0.17) which are also different in magnitude, and for knowing the value of these differences, they were tested by the T-test for correlated samples, hence, the result came with a calculated amount of (7.84), which is a greater value than the corresponding tabular at a free degree of (20) and a level of significance (0.05) of (1.725), which confirms that there is a tangible development, due to the effect of weight training, on which the first group was trained, as "training with weights is one of the methods of development for physical elements that work to gain muscle capacity. It also improves and develops athletic performance (1974: 4), and the same case is found in the other researched abilities and achievement in swimming (50) meters freestyle for members of the weight group, as the values of (T) calculated accordingly came, respectively (the characteristic strength of velocity for the two legs 51,27, the distinctive strength with speed for arms 7,48, agility 19,59, achievement 102,16) all of which are statistically significant, and this means that weight training represents an important place in the program for preparing athletes, including swimmers at all levels because of their great importance in developing all abilities. These capabilities complement each other to achieve the best achievement.

2 - The effect of rubber rope exercises on developing physical and motor abilities and improving the achievement of swimming (50) meters for youth.

Table (4): Shows the statistical estimates for research variables and diversity between them at both pre and post-measurements (Rubber ropes)

Variables	Pretest		Posttest		(t) value*	Statistical Significance
	Mean	SD	Mean	SD		
The explosive power of the legs	2.07	0.175	2.32	0.102	6.65	Sig.
Distinguished strength at the	29.83	1.25	33.27	1.256	160.60	Sig.

speed of the Legs						
Distinguished strength at the speed of the arms	13.33	1.15	17.05	0.864	9.97	Sig.
Agility	11.99	1.41	8.62	1.003	27.90	Sig.
Achievement in (50)m freestyle swimming	32.20	0.538	29.10	0.534	123.18	Sig.

* The tabular value (t) is (1.725) at the significance level (0.05) and the degree of freedom (20).

Table (4) shows the obvious difference between the statistical estimates (mean, deviation) achieved when measuring research variables in terms of physical and kinetic abilities and swimming achievement (50) meters for young swimmers, who trained according to a program in which auxiliary means were used, which are rubber ropes, as well as its difference when the two measurements before and after the experiment. For example, when testing agility, its time amounted is (11.99) seconds at the pre-measurement, while at the post measurement it became (8.62) seconds as a verified arithmetic mean. While the standard deviation, it was also different, as its value came when measuring the same test (agility) by (1.41) and it became at the telemetry by (1.003).

The truth here is that such differences in the estimates of arithmetic mean and standard deviations included all the research variables at the pre and post measurements, and to find out the truth of this difference to indicate the amount of effect of the exercises used with this group of young swimmers, and the researchers used the T-test for correlated samples (T), and from which the results respectively came on (the explosive power of the two legs is 6.65, the distinctive strength of the velocity of the two legs is 16.60, the characteristic strength of the velocity of the two arms is 9.97, the agility is 27.90, and for the achievement in swimming (50) m freestyle is 123.13) and all these values are greater than the corresponding T- value at free degree (20) and the level of significance (0.05), which is equal to (1.725). Which means that the difference between them is statistically significant, and this indicates the effectiveness of rubber rope exercises in effecting the action, which causes the development of the physical and movement abilities of young swimmers and the improvement of their achievement in swimming (50) m freestyle. In other words, rubber rope exercises are “a good and economical training method that is compatible with the nature of training duties at the same time to develop physical attributes such as strength, endurance, elongation and flexibility' (2: 225).

We can conclude that the rubber rope exercises, which were carried out by members of the second group, work to develop strength Musculature in general and the development of explosive ability and power characterized by speed and agility in particular, and this will inevitably be reflected in the improvement of swimmers achievement in swimming (50) m freestyle.

3 - The difference between the effect of weight training and rubber ropes in developing abilities and improving the achievement of (50) m freestyle for swimmers.

According to what we find in tables (2, 3) we note that its findings proved the development of the results of the post-measurement over its counterparts in the pre-measurement of all the variables discussed, and here it means that the weight

training in the first group and the rubber rope exercises in the second group have actually affected the development of these capabilities (Physical and kinetic) and improving the achievement of young swimmers in swimming (50) m freestyle.

In order to know the best impact of any of these two training methods and on any of the abilities or achievement, we highlight Table (5).

Table (5): Shows the statistical estimates for research variables and diversity between them for both groups at the telemetry

Variables	Weights Group		Rubber Ropes Group		(t) value*	Statistical Significance
	Mean	SD	Mean	SD		
The explosive power of the legs	2.468	0.168	2.323	0.102	3.348	Sig. for weights
Distinguished strength at the speed of the Legs	32.08	1.014	33.265	1.256	3.372	Sig. for weights
Distinguished strength at the speed of the arms	15.19	0.928	17.047	0.864	6.708	Sig. for weights
Agility	9.492	2.413	8.622	1.003	2.298	Sig. for weights
Achievement in (50)m freestyle swimming	29.509	0.561	29.102	0.534	2.402	Sig. for weights

* The tabular value (t) is (2.021) at the significance level (0.05) and the degree of freedom (40).

Table (5) shows that the available values are differ and vary according to their estimates at the arithmetic mean and the standard deviations that were achieved for the subjects of the research in each of the two experimental groups and with all the research variables. For accounting the first group (weights) the arithmetic mean and the standard deviations were respectively achieved (the explosive power for two legs is (2.468 , 0.168), (characteristic force with velocity of the two legs 32.08 , 1.014) and (characteristic force with speed of arms 15.19 , 0.928) and (agility 9.492 , 2.413) and (swimming achievement (50) m freestyle 29.509 , 0.561); while the second group (rubber cords) were achieved in arithmetic means, respectively (2.323 , 33.265 , 17.047 , 8.622 , 29.102) as well as standard deviations, respectively (0.102 , 1.256 , 0.864 , 1.003 , 0.534).

From this comparison, we find that the difference is clear in the values and to investigate these differences, the selection came through the T test of the independent groups (T), and in it the results came to indicate the truth of these differences for their statistical significance, as all the calculated values came, and they are respectively (3.348 , 3.372 , 6.708 , 2.298 , 2.402) greater than the corresponding tabular value for each of them, which is (2,21) at a free degree of (40) and a level of significance (0.05).

This means that the improvement and development that characterized the two experimental groups came as a result of their training and the diversity of their resistance and the difference in performance in them, especially muscle strength

training, which is the basis for the development of the physical and movement capabilities of young swimmers, which was reflected in their achievement in swimming (50) m freestyle. But this difference in development gave preference to any of the exercises used with assistive devices, including weights and rubber ropes.

The results investigated by the researchers gave preference to weight training in developing the explosive ability of the two legs, because the weight training was distinguished by a variety of tightening its resistance, which gained the swimmers an instantaneous momentum (instantaneous) and this is due to the speed of muscle contraction of their leg muscles. The preference also came to the rubber rope exercises in developing the distinctive strength of the speed of the two legs and the distinctive strength of the speed of the arms, agility, in addition to this achievement in swimming (50) m freestyle among young swimmers.

This is due to the fact that the development of the characteristic strength with speed can be traced back to the relationship of muscle strength to speed in performance, as the force characterized by speed is one of the forms of muscle strength associated with speed, which is of very great importance, especially in short distance races in which a 50m freestyle swim. This is due to the swimmer's need for high muscle strength coupled with speed and continuous performance in order to move in water, in addition to the great importance of agility in events and competitions that deal with time in achievement, as the more the swimmer is coordinating movements as it is in the exercises of rubber ropes with high flow in performance, whenever the best in achievement, this shortens many parts of the second.

Conclusions and recommendations

Conclusions:

1- Both weight training and rubber ropes positively affected the development of physical and movement abilities and achievement in the 50m freestyle swimming for young swimmers.

2- Weight training has an advantage in developing the explosive ability of the two legs than it is in the exercises of rubber ropes.

3- The rubber rope exercises showed a preference in the effect of developing the distinctive strength of the speed of the two legs and the distinctive strength of the speed of the arms, agility, and improving the achievement of young people in swimming (50) meters free compared to their achievement in weight training.

Recommendations:

1- Swimming coaches have to consider an opinion between the two training methods and their methods that is beneficial for training the physical and kinetic strength of swimmers with their differences and the specialized distances in them.

2- It is necessary to take into account the use of the rubber rope method when improving their achievement of swimmers in swimming (50) meters freestyle.

3- It is okay for the trainers to know any of the physical and motor abilities necessary for the swimmer and to achieve his achievement in order to take them into account when developing his training programs.

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