THE EFFECT OF CROSSFIT EXERCISES ON THE DEVELOPMENT OF SOME FORMS OF MUSCULAR STRENGTH AND FUNCTIONAL INDICATORS AND THE ACHIEVEMENT OF SWIMMING 50M BUTTERFLY

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Abstract

The purpose of this paper is to develop some forms of mental strength and indicators for 50m butterfly swimmers, prepare CrossFit exercises for the sample members, and then find out the extent of the impact of these exercises on the selected forms of strength, as well as the selected functional variables and the 50m butterfly swim. The researcher used the experimental approach for the research community. He was chosen by the intentional method from the butterfly event swimmers who represent the national team for the year 2022-2023, which numbered (5) swimmers, and the training curriculum was applied to them for a period of (8) weeks at a rate of (3) units per week, and after conducting tests on the sample and extracting and processing the results Statistically, the researcher concluded that CrossFit training had a positive impact on developing forms of strength and functional indicators, as well as the achievement of 50m butterfly.

Keywords: Special exercises. Muscular strength. Swimming. Butterfly swimmers

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Introduction

CrossFit training is one of the modern exercises, which has met with a wide exception in the world recently, due to the nature of the exercises that work to develop the level of athletes in all physical, physiological and skill aspects and also works to achieve the best sports achievements, as its exercises include resistance, cardio, weightlifting and jogging Swimming for a limited period of time and according to the individual's physical and health condition, then it is a deliberate attempt to improve physical efficiency, which includes strength and endurance, and strengthening the heart, blood and stomach system, As " Wijdan Sami Abdel Hamid. 2012" mentions, "Cross Fit training aims to prepare a sports player through ten basic elements, which are endurance, cardio fitness, muscular strength, flexibility, explosive power, speed, compatibility, agility, accuracy, and balance, through balance Between aerobic and anaerobic work, it is commensurate with the specialized activity", as a result of the mechanical intensity that characterizes these exercises, therefore, they cause functional and physical changes, and since butterfly swimming is one of the types that relies a lot on high physical capabilities and on raising the functional capabilities in the body because of the high effort that butterfly swimming has, so butterfly swimming trainers are interested in preparing the swimmer from All sides to get the highest levels and records " Adam Ismail Muhammad Ali. 2018 " confirms, on the authority of "Mohammed Al-Qat," that the sport of swimming requires the availability of physical capabilities, especially among its practitioners, in order to be able to cover the race distance in the shortest possible time. Therefore, the researcher decided to use this type of training and find out the extent of its impact on the development of strength and functional indicators and the achievement of swimming 50m butterfly to raise the level of effectiveness to the best.

Research objective

- Preparing CrossFit style exercises for butterfly swimmers.
- Identifying the effect of exercises on some forms of strength and the achievement of swimming 50m butterfly.

Research hypotheses

- The researcher hypothesized that there were statistically significant differences between the pre and post-tests of the group in the selected physical abilities and the achievement of swimming 50 m butterfly.

Research Methodology and Field Procedures

Research Methodology

The researcher used the experimental approach due to its suitability to the nature of the study, as it is "one of the most sufficient means to reach reliable knowledge."(Fine Dallin Due Boulid. 1985).

Community and Sample Research

The research community was determined in the intended way, and they are the national swimmer's team of (5) advanced swimmers, so the study relied on the experimental group only.

As for the means of collecting information, tools and devices used in the research, the researcher used the following methods:

- Sources and references.
- Tests and benchmarks.
- International information network.
- Statistical program (SPSS).

Devices and tools

- Stopwatch Number (2)
- Medicine balls weighing (3) kg.
- Front wire device.
- Wooden crates 30 cm high.
- Abdominal exerciser.
- Sling.
- Horizontal device.
- Rubber ropes.
- Dumbbells of different weights.
- Iron discs of different weights.
- Iron bar.

Forms of force have been tested

- Strength characteristic of the speed of the muscles of the arms.
- Strength characteristic of the speed of the muscles of the two legs
- Endurance strength for the arms
- Endurance strength for the two legs
- Abdominal muscles.

They were measured using the following physical tests:

- Front support test, flexion and extension of the arms during 15 seconds (Ali Al-Fartousi et al. 2015).
- Three jump consecutive test (Louay Ghanem Al-Sumaidaie et al. .2010.).
- Flexion and extension of the arms from oblique supination test (Ammar Hamza Hadi Al-Husseini .2002).
- Half-squat jump test (Laila Al-Sayed Farhan .2007).

As for the physical indicators, the following were selected:

- Medium anaerobic capacity.
- Heart rate after exertion.

Measured using the following tests:

- Wingate Test (Falah Hassan Abdullah .2016)

The researcher chose butterfly swimming, especially the 50-meter swim, because it requires very high effort and special training. The achievement was measured:

50m butterfly swimming test:

The researcher carried out the pre-tests on 2/2/2022 and then the exercises of the training curriculum were applied in the CrossFit style, on the day of the coincidence Sunday 6/2/2022 until the day of the coincidence Wednesday 30 /3 /2022 and the curriculum (see appendix 1) was developed based on the scientific training sources and benefiting from the researcher's experience in the field of sports training science.) weeks by (3) training units per week, i.e. (24) training units, and the load fluctuation (3-1) for each week, and the researcher relied on the intensity used for training (80-90%)

After applying the curriculum, the post-tests were conducted under the same conditions as the pre-tests, on the day of coincidence Sunday 3/4/2022.

After extracting the results of the pre and post-tests, statistical treatments were performed as shown in Table 1 (Table 1).

It is clear to us from Table 1 that Sig values > 0.05 in all selected physical variables, which indicates that there are significant differences between the pre and post-test. Training for a period of 18 weeks and here is indicated quoting (Costic Wilmore) that most of :the variables resulting from the training occur during the first period of applying the exercises within 6-8 weeks (Abu Al-Ela Ahmed. 1996), also, the researcher's use of CrossFit exercises had a positive and effective effect in raising the level of swimmers physically, and this is what was indicated by, that "Cross Fit training aims to develop a program to prepare the trainees in the best preparation" (Abdul Halim and Ali 2018). Therefore, it is "an example of achieving the maximum amount of work done in the shortest time, as the adaptation of effort is necessary for the best results in employing a constantly varied curriculum of training and technical movements to achieve significant gains in physical fitness (Ehab Nafeh Kamel .2019).

And also the application of the research sample to the upward method, contributed to the occurrence of cases of ataxia in them through the use of standardized exercises, as each indicates the process of rationing the training intensity in its different degrees and related to the type of sports activity is extremely important for both the coach and the athlete when preparing the training curriculum in the different training methods (Kelve and Robert Fair Shans. 2006) also, the development that occurred in the strength distinguished by the speed of the muscles of the arms and legs, the researcher attributes it to the selection of good and appropriate definitions in the CrossFit style, which led to an increase in the capacity of the muscular and nervous systems. This was indicated by that "muscle fibers have the ability to produce great force by changing the type of resistance, and thus it will increase and increase according to its ability to produce energy" (Sareeh Abdel Karim. 2003) and that the nature of the definitions of the CrossFit style, which is characterized by explosive training and rapid explosive movements, led to the development of speed in addition to muscular strength, and this was confirmed by (Ben Buckley. 2013). "This organized and programmed training and the use of types of intensity in training and the use of optimal types of rest between repetitions lead to the development of achievement and the process of overcoming its resistance by performing a specific movement and completing it as quickly as possible or in the shortest possible time is achieved in the service of the explosive force and by repeating that the effectiveness of the force characterized by speed has increased Since the force that allows speed is a group of several explosive forces. (Frank Abdel Karim. 2003).

As for the development of the variables of endurance of the muscles (arms, abdomen, and legs), the researcher also attributes it to the CrossFit exercises used, which were characterized by suspense, enthusiasm, and excitement, which led to the sample's determination to continue performing and managing appropriate repetitions to develop endurance, and this is what indicated the "quality of the exercises used in the training positively affects the improvement of the strength and endurance characteristics through the performance of many repetitions that lead to stabilization of the performance time and raise the endurance quickly" (Muhammad Abd al-Hasan. 2008) . As strength exercises with numerical repetitions and for a long time contributed to achieving these results, as well as "the ability of the body's systems to resist fatigue during continuous effort, which is characterized by its long duration and its association with several levels of muscle strength." (Kemper. T. 1996).

We also found out from Table (1) that the values of sig > 0.05 in the selected functional variables, which indicates that there are significant differences between the pre and post-tests , and here the researcher attributes it to the exercises that were applied in the CrossFit style, which helped to improve the efficiency of the circulatory system by increasing the number of strokes the heart is after effort, and this is consistent with what was indicated by about the Lord "Training adapts the heart and blood circulation, and the player becomes able to raise the heart rate as his athletic level improves (Muhammad Mari Muhammad .2004)" also indicated that "the number of heartbeats drives the good indicators that athletes have reached" (Muayad Abdul Latif Ali .2008).

Also, in table 1 we see the significant differences in the average anaerobic capacity index, and the researcher attributes this development to the physical level reached by the sample as a result of high-intensity training, because Cross Fit training is subject to training under conditions of fatigue, and here each indicates that "the efficiency of anaerobic endurance increases by delaying the onset of fatigue, and the onset of fatigue is delayed during anaerobic endurance activities by three differences: reducing the rate of lactic acid accumulation and increasing lactic acid endurance, and fatigue occurs as a result of a decline in the anaerobic capacity index" (Ahmed Abdel-Ghani Taha Al-Dabbagh, Hanan Murad. 2017).

And from the results of Table (1), it also shows us that there are significant differences in the results of the completion of the 50m butterfly swimming. The researcher attributes this result to the effect of the CrossFit exercises prepared by the researcher and in proportion to the specificity of the game and as a result of the development of the physical level of the swimmers in the speed-distinguishing strength of the muscles of the arms and legs and the endurance of strength in The muscles of the arms, abdomen, and legs, and the development of the functional variables, all of this had a clear effect in raising the level of digital achievement for swimming 50m butterfly, and this is consistent with "Physical preparation is an important condition for achieving adaptation and raising the level of performance for swimmers through sports training and focusing on motor and physical capabilities (strength and endurance) (Mahmoud Ragai Muhammad et al. 2019) And also confirms "The ground exercises are one of the most important components of the training programs for swimmers of all ages and levels, because of their impact on their ability to move quickly in the water, especially the strength exercises that take place in the same actual performance track so that the required effect can be obtained to improve the digital achievement of the swimmer." (Wejdan Sami Abdel Majeed Mohamed. 2019). In addition indicates, "Physical preparation is the main pillar that contributes to raising the level of the players and enables them to perform the basic tasks effectively." (Ibrahim El-Sayed Ibrahim. 2019). From the aforementioned, the researcher concluded that CrossFit training has a positive effect on the physical and functional variables and the completion of the 50m butterfly swimming. The researcher recommends the necessity of developing forms of strength among swimmers in order to raise their physical level, as well as conducting similar studies on different samples and other events, and emphasizing ground exercises for swimmers because of their importance in raising the level of the swimmer.

Table 1: Shows the statistical results of the pre and post-tests of the research variables.

no.	Variables	Measuring unit	Pre-test		Post-test		arithmetic mean of difference	standard deviation of differences	T value	Level sig	Type sig
			Mean	standard deviation	Mean	standard deviation					
1	Butterfly swimming 50 m	time	27.36	0.489	26.89	0.437	0.46	0.21	4.94	0.008	sig
2	Strength characteristic of the speed of the muscles of the arms	number	16.80	1.303	18.80	1.836	2.00	0.70	6.32	0.003	sig
3	Strength characteristic of the speed of the muscles of the two legs	meter	6.04	0.382	6.43	0.395	0.39	0.03	22.60	0.000	sig
4	Endurance strength for the arms	repetition	43.60	3.040	48.20	3.11	4.60	0.54	18.77	0.000	sig
5	Endurance strength for the two legs	repetition	39.40	2.30	46.20	2.58	6.80	0.83	18.17	0.000	sig
6	Endurance the abdominal muscles	repetition	45.40	2.07	55.80	2.28	10.40	0.89	26.00	0.000	sig
7	Anaerobic capacity	watt/sec	380.0	7.90	420.00	11.18	40.00	5.00	17.88	0.000	sig
8	heart rate	pulse/min	181.80	1.48	186.60	1.81	4.80	0.83	12.82	0.000	sig

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Definition	Exercise	Intensity	Number of set	Rest between exercises	Rest between set
1- Throwing a football	30sec	%80	3	40sec	3min
2- Push up exercise	30sec	%80	3	40sec	3min
3- Exercise (front prison wire) from the sitting position, pull down towards the upper chest, then return it to its position	30sec	%80	3	40sec	3min
4- Jumping with both feet on a box with a height of 45 cm and landing	30sec	%80	3	40sec	3min
5- An important glute raising exercise from a long sitting position. The individual extends the torso backwards slightly, then builds forward and touches the feet.	30sec	%80	3	40sec	3min
6- Jumping rope exercise by standing and jumping with both feet in place	30sec	%80	3	40sec	3min
7- Exercise (raising the legs together) while hanging on the horizontal bar with the hands limited	30sec	%80	3	40sec	3min
8- Rubber rope exercise (resistance) Connecting the rubber ropes to a column from the exercise position to do a butterfly exercise	30sec	%80	3	40sec	3min

Sample training unit from the first week

Training unit time 40-45 minute

Definition	Exercise	Intensity	Number of set	Rest between exercises	Rest between set
1- Throwing a football	20sec	%84	3	40sec	3min
2- Push up exercise	20sec	%84	3	40sec	3min
3- Exercise (front prison wire) from the sitting position, pull down towards the upper chest, then return it to its position	20sec	%84	3	40sec	3min
4- Jumping with both feet on a box with a height of 45 cm and landing	20sec	%84	3	40sec	3min
5- An important glute raising exercise from a long sitting position. The individual extends the torso backwards slightly, then builds forward and touches the feet.	20sec	%84	3	40sec	3min
6- Jumping rope exercise by standing and jumping with both feet in place	20sec	%84	3	40sec	3min
7- Exercise (raising the legs together) while hanging on the horizontal bar with the hands limited	20sec	%84	3	40sec	3min

8- Rubber rope exercise (resistance) Connecting the rubber ropes to a column from the exercise position to do a butterfly exercise	20sec	%84	3	40sec	3min

Appendix 1: Sample training unit from the first week (Training unit time 40-45 minute).