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THE EFFECT OF A TRAINING CURRICULUM ACCOMPANYING RUBBER ROPES ON THE DEVELOPMENT OF ARMS SKILL AND SOME PHYSIOLOGICAL VARIABLES AMONG JUNIOR CRAWL SWIMMERS

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Abstract
The aim of this study was to identify the effect of the training method designed by the researcher on the elbow skills and some physiological variables of the freestyle for swimmers from Al-Amara Sports Club and Almajar Alkabir Sports Club in the Misan Governorate. The study was carried out in the 2021/2022 season, with a purposive sample of 12 swimmers from the aforementioned clubs. Half of the participants (6 swimmers) were assigned to the experimental group and the other half (6 swimmers) were assigned to the control group. The training programme consisted of 3 sessions per week over 8 weeks. Previous to and following the intervention physical and skill tests were measured. Data were collected and then analyzed by a statistical packages program (SPSS). Results of the study showed that the rubber rope training program was effective ($P<0.05$) on all the variables of the experimental group participants. QI initiatives were associated with this change, as indicated by significant differences between pre- and post-tests in favor of post-tests. Results of the study showed that the traditional program had significant effect on all the variables measured. Moreover, differences in all variables between the experimental group, control group, as well as high used of innovative experimental group member were significant on the 0.01 level. The researchers suggest that muscle strength in the arms should be higher priority during the sports season in developing the training program. This is because it directly contributes to improving performance and achieving records, as well as when designing specialized teaching programs. Individuals who participate in swimming clubs and members of swimming teams.

Keywords: Training Curriculum, Accompanying Rubber Ropes, Physiological Variables, Front Crawl, Swimmers.

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Introduction

The significance of swimming lies in its comprehensive nature, engaging all muscle groups in the body. It serves as a recreational activity that provides an escape from one's daily environment, whether it be an office for an employee, a school for a student, or a workplace for a laborer (Barbosa et al., 2019). These daily routines can have a detrimental impact on both the physical and psychological well-being of individuals. Swimming, on the other hand, offers numerous health benefits, such as enhancing the body's resistance against diseases, improving flexibility, and enhancing agility in movement (Bucea-Manea-Țoniș, Jureschi & Vasile, 2024). These attributes are crucial for athletes in various sports. Therefore, it is imperative for coaches to incorporate swimming courses into the transitional period between seasons. In order to enhance the players' flexibility and agility (Larson et al., 2019). During swimming practice, the body is positioned parallel to the water's surface, resting smoothly on it (Mullen, 2018). This relaxation of the spine is not experienced during daily activities or even during sleep, when the spine supports the body's weight while lying down (Ilham, 2021). This process of spinal extension strengthens the muscles and provides rest for the body, as the spine carries the body's weight throughout the day, enduring the greatest burden (Brooks, 2019). Swimming is widely recognized as a therapeutic practice for the body in daily life (Yang et al., 2018). It is recommended by doctors as a remedy for the negative effects of modern technology, such as obesity caused by sedentary lifestyles, increased use of transportation and communication devices, and lower back pain resulting from prolonged sitting in front of computer screens. Additionally, swimming can help alleviate the negative impacts of a fast-paced and stressful lifestyle, as well as various diseases (Lin et al., 2021). Undoubtedly, swimming is a significant competitive sport at the local, regional, and international levels. The continuous inclusion of swimming in the modern Olympic Games since its inception is a testament to its success (Gould, 2019). Furthermore, the digital achievements in swimming further demonstrate its alignment with the global digital development and sports trends. Therefore, swimming has gained significant attention in the modern era, as it has a prominent position with its diverse races. Swimming has become a prominent sport in both the Olympic and international tournaments, as well as in the digital era (Demarie, Chirico & Galvani, 2022). This is a direct consequence of advancements in science, planning, and artistic aspects. There has been a recent surge in studies and research focused on competitive swimming (Lohn, 2021). The aim is to discover and develop new training methods and understand their effects on physical abilities. The ultimate goal is to excel in local, international, and Olympic championships, as swimming is a sport that offers a high potential for winning medals (Nicol, Ball & Tor, 2021). Practically, it is noted that swimmers must adhere to the principle of increasing the number of arm movements when they want to increase their speed, particularly in short-distance (50m and 100m) and medium-distance (200m) freestyle swimming (Nurmukhanbetova, Gussakov & Yermakhanova, 2023). They should either maintain the length of their arm movements or increase it while keeping the same frequency. This ensures that the average swimming speed is maximized (Morais et al., 2020). The rate is determined by the number of arm movements per minute and the distance covered with each full arm movement in the water, measured in meters (Santos et al., 2020). According to Sánchez-Rodríguez, Raufaste and Argentina (2023), the average speed is calculated by multiplying the length of the pull by its frequency. This distance is then multiplied by the total movements of the arm to give you the total distance covered. So, there are a lot of training programs that focus on specific elements of fitness, e.g. speed and strength. These programs are

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designed to improve the speed and strength of the arms and legs. And researchers have learned things they didn't know but, which were discoverable somewhere inside the iceberg– through rigorous research and study. Study background there was a previous study which was conducted in Misan Governorate on sports environment and its role in arm muscle strength development and some physiological variables. This research also looked into the extent to which these things affect performance in freestyle swimming over 50 meters.

Study problem

Swimming like any other game is a demanding process and it is an amalgam of several interconnected factors. Such elements consist of specific training for peak efficiency; the athlete's own strength and function; appropriate efficacious use of the skills; and top level use of current training methods. Freestyle, which is a type of competitive swimming that takes place on the belly, generally with the help of the swimmer´s own steam-power, and is defined as any style of swimming where a swimmer is on his/her belly, with the body in line with the water surface level. This is variable — a number of studies have shown that the arms are responsible for approximately 80-85% of the force in moving the body forward (Peyton and Krabak 2023; Mullen 2018) with the legs producing approximately 15-20%. NOTE : Arms are stronger than legs so they are the main source of generating power while doing freestyle. The background of the researcher associated with the information supports the same. As an expert in swimming at the level of a bachelor degree and through international certificates in coaching and training, the researcher conducted a study; to apply a proposed training program. OBJECTIVESThe purpose of the program was to increase arm strength and some physiological parameters of freestyle swimming. Another goal of the researcher was to identify the effect of the program on skill performance and digital achievement in freestyle swimming at the Misan Governorate club. According to Zamparo, Cortesi and Gatta (2020), swimmer speed is primarily related to distance per stroke and stroke rate. The main reason is the forward progression in swimming is driven by the arms activates which entirely depend on muscular strength formed by the motor tasks and the requirement of various physical aspects. Reproduced from Ruiz-Navarro et al. (2020), Morouço and Arellano study where researchers found that arm power is significantly positively related to swimming speed.

Objectives of the study

1. Design a training program using TRX ropes to develop the efficiency of the arm muscles in forward crawl swimmers.

Research hypotheses:

1. There are statistically significant differences between the mean of the pre- and post-measurement of the experimental group in the efficiency of the arm muscles in the forward crawl swimmers.
2. There are rates of improvement between the mean of the two dimensional measurements of the experimental group in the efficiency of the arm muscles of the forward crawl swimmers in favor of the telemetry.

Research Areas

Human Area: players from Amarah Club and Almajar Alkabir Club, for the 2021/2022 sports season.

Spatial Area: Swimming Crane Land Entertainment Misan.

Temporal Area: Period from (1/6/2022) to (1/10/2022).

Methodology

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The researchers employed the experimental technique in both the experimental group and control group, conducting pre- and post-tests to align with the study's objectives and the nature of the research problem.

Study population

An analysis of muscle efficiency and upper limb fat percentage is conducted to compare long distance and short distance front crawl swimmers among the youth in Misan Governorate.

Sample Tuition

The study sample was intentionally chosen from the swimmers of Al-Amara Sports Club and Almajar Alkabir Sports Club who were registered for the 2018-2019 season and had expertise in freestyle swimming. The sample consisted of 12 swimmers, divided equally into two groups: an experimental group of 6 swimmers and a control group of 6 swimmers. Table 1 displays the characteristics of the study sample, including age, height, and mass.

Table 1: Characteristics of the study sample according to the variables of age, height and mass (N 12).

Variables	Unit of measurement	M	SD	Torsion coefficient
Age	year	15.17	1.25	0.37
Weight	kg	52.75	0.60	0.06
Length	CM	155	9.45	0.26

Table (1) presents the arithmetic mean and standard deviation values for the age, height, and mass variables. The age variable was 1.25-21.75 years, the height variable was 1.77 ± 0.06 meters, and the mass variable was 77.75 kg. Given that the torsion coefficient values have varied between (3), it suggests that the study sample is homogeneous. Consequently, the members of the study sample were split into two equal groups to guarantee equivalence in the pre-measurement of the variables on investigation. For this purpose, the researchers employed the T test for independent samples, as illustrated in Table 2.

Table 2: Results of the (T) Equivalence Test on the Tribal Measurement between the Experimental and Control Groups in the Muscular Strength of the Arms in some physiological variables and the achievement of performance 50 meters of Al-Amara Sports Club and Almajar Alkabir Sports Club (12).

Variables	Unit of measurement	Experimental Group		Control group		T	Sig
		M	SD	M	SD		
Aqla during (10) T	Second	5.09	1.03	5.11	0.82	0.192	0.860
Throwing the good ball (1) kg	Kg	13.32	1.10	12.66	1.07	0.733	0.540
Throwing the good ball (2) kg	Kg	6.11	1.23	5.93	1.04	1.677	0.130
Throwing the good ball (3) kg	Kg	3.55	0.95	3.22	0.80	0.910	0.389
Heart rate	Number	120	5.21	120	4.77	0.973	0.172
Number of breaths	Number	24.9	4.05	24.8	3.66	1.623	0.121

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Performance achievement 50 meters	Seconds\ Meters	33.76	4.12	33.44	3.08	2.020	0.060

Significance level (0.05) (v) Tabular (3.16) df (10).

The results of Table (2) show that there were no statistically significant differences (0.05) in the pre-test muscular strength of the arms and some physiological variables in freestyle swimming in swimming clubs in Misan Governorate between the members of the experimental and control groups. This suggests that the members of the two groups were similar before to the implementation of the program.

Study Tools

In order to collect the required data for the study, the researchers used the following:

First: Training Program

The recommended training program was implemented for a duration of 8 weeks, with a frequency of 3 training units each week.

Second: Tools and devices assisting in the application of the program

- ❖ Weights of different weights.
- ❖ Electronic stopwatches measure to the nearest 1/100 of the type (CASIO).
- ❖ Fox whistle .
- ❖ Buoyancy buoys.
- ❖ Intake device (cable).
- ❖ Rubber ropes.

Third: Tests used

1. Tensile upward test on the hook.
2. Medical ball throwing test (1 kg).
3. Medical ball throw test (2 kg).
4. Medical ball throw test (3 kg).
5. Measure the number of heartbeats.
6. Measure the number of breaths .
7. Freestyle mileage test (25) per second (meters).

Exploratory experiment

The exploratory experiment was carried out on a subset of four swimmers from the research population who shown competence in freestyle swimming over the time frame of 1/6/2018 to 1/9/2019. These swimmers were specifically removed from the study sample. The objective of this experiment was:

1. Identify the scientific transactions of the tests in terms of their validity and stability.
2. Ensure the extent to which the team understands the nature of the tests and how they are performed.
3. Ensure accurate data recording.
4. Avoid the difficulties facing the tests and the possibility of avoiding them.
5. The suitability of equipment and tools to perform the tests.
6. Know the time it takes to perform tests.

Scientific characteristics of study tests

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Honesty

The coefficient of test validity is a crucial scientific criterion. An honest test is one that precisely measures the specifically intended phenomena and does not yield any other results. In his study, Gilmore (2007) employed two approaches to assess the genuineness of the test material and its coherence with the sample members. The first approach involved reviewing references and scientific literature pertaining to this subject. The researcher reached a consensus on the sincerity of these tests. The second method was virtuological honesty, in which the researcher obtained information from arbitrators who have professors in the field of physical education and sports training. Arbitrators were then given the tests to see what they thought. The researchers then modified the tests based on unsolicited feedback from the arbitrators, who had noted suggestions and observations while administering the tests.

Constancy

The stability of the test is a key element of scientific transactions, meaning that, when a test is repeated on the same subjects in the same circumstances, it should provide the same results (Ababneh et al., 2019). In order to find out the coefficient of stability of the tests and the selfishness on a sample of the study population, the researcher has used a method of testing and re-testing the same test on the sample population with a time gap of (7) days, since the circumstances are similar. This approach is by computing the square root coefficient that incorporate similarity of situations (Oster, 2019). We can check whether test is valid or not by using below equation. Integrity Self-consistency. To maintain the consistency of the muscular force tests for the arms in the free-swimming performances of the swimmers for both Al-Amara Sports Club and Al-Hungary Al-Kabir Sports Club, the researchers repeated the muscular force tests on a reconnaissance sample of four swimmers from Misan governorate who were not in the study sample directly. The interval between both applications was 7 days a part. The Pearson correlation coefficient was then used to assess the significance of the relationship between the two applications, as shown in Table (3).

Variables	Unit of measurement	Experimental Group		Control group		T	Sig
		M	SD	M	SD		
Aqla during (10) T	Second	5.09	1.03	5.11	0.82	0.192	0.860
Throwing the good ball (1) kg	Kg	13.32	1.10	12.66	1.07	0.733	0.540
Throwing the good ball (2) kg	Kg	6.11	1.23	5.93	1.04	1.677	0.130
Throwing the good ball (3) kg	Kg	3.55	0.95	3.22	0.80	0.910	0.389
Heart rate	Number	74	5.21	120	4.77	0.973	0.172
Number of breaths	Number	14.5	4.05	14.8	3.66	1.623	0.121
Performance achievement 50 meters	Seconds\ Meters	33.76	4.12	33.44	3.08	2.020	0.060

Statistically at the significance level (0.05 * significance level (3.16).

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The findings of Table (3) demonstrate the consistency of the muscular strength tests in the arms of swimmers from Al-Amara Sports Club and Almajar Alkabir Sports Club during freestyle swimming. The Pearson correlation coefficient values ranged from 0.73 to 0.91, all of which are statistically significant at the 0.05 (a) level of significance.

Objectivity

The researchers claim that the objectivity of the tests is derived from the absence of influence from subjective judgments, impartiality, and self-intervention by the testers, as he suggests. According to Gebhardt and Baker (2017) the objectivity of a test is determined by the consistency in the method used to evaluate the performance of testers, regardless of the differences in arbitrators. The clear instructions and conditions of the tests, together with the testers' awareness and full knowledge of these conditions and instructions, ensure that there is no variation in the method of evaluation throughout the tests. The exams exhibit a significant level of objectivity. As the researcher elucidated the procedure of conducting tests and registering the outcomes to the work team, he also provided ongoing support and personally recorded the data.

Study Application

Pre-tests

Following the exploratory experiment and to confirm the validity and stability of the tests, the researchers administered pre-tests to both the experimental and control groups. These pre-tests were conducted between the dates of 3/6/2018 and 10/6/2018.

Proposed Program

The training program under consideration was implemented among the participants of the experimental group from June 15, 2018, to September 18, 2018. Conversely, the control group received the standard program throughout the same time frame.

Post-tests

Following the conclusion of the 8-week training session, the dimensional characteristics of both the experimental and control groups were measured between September 20, 2018.

Statistical Treatments

The data processing was conducted using the statistical packages software for the social sciences (SPSS) with the application of the following statistical procedures:

- Arithmetic averages, standard deviations, and paired-t-test to determine the differences between the pre- and post-measurement and the percentage change in both the experimental and control groups.
- Test (T) for two independent groups (independent t - test) to determine the differences in dimensional measurements between the experimental and control groups.

Results

First: Results related to the first question

Are there statistically significant differences at the level of significance (0.05) between the pre- and post-tests among the members of the control group in the effect of the training program on the variable of muscle strength of the arms and some physiological variables and the achievement of performance 50 meters in free swimming among the players of the Almajar Alkabir Club?

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The researchers employed the test (T) for the corresponding samples (samples-T-test) as referenced in Table (4) to ascertain the disparities between the pre- and post-tests among the members of the control group and address this inquiry.

Table 4: Test results (T) to indicate the differences between the pre- and post-measurements among the members of the control group in the muscular strength of the arms and some physiological variables and the achievement of performance 50 meters in freestyle among the players of the Almajar Alkabir Club (n 6).

Variables	Unit of measurement	Pretest		Posttest		T	Sig
		M	SD	M	SD		
Aqla during (10) T	Second	5.11	0.82	5.82	0.93	2.44	0.259
Throwing the good ball (1) kg	Kg	12.66	1.07	13.31	0.91	3.84	0.971
Throwing the good ball (2) kg	Kg	5.93	1.04	7.08	1.11	3.55	0.996
Throwing the good ball (3) kg	Kg	3.22	0.80	3.98	0.73	0.910	0.389
Heart rate	Number	120	4.77	118	3.84	0.973	0.172
Number of breaths	Number	14.8	3.66	22.5	3.37	1.623	0.121
Performance achievement 50 meters	Seconds\ Meters	33.44	3.08	32.29	2.70	2.020	0.060

Significance level (0.05), (v) tabular (2.201), df (5).

The results of Table (4) indicate that there are statistically significant differences between the pre- and post-tests among the members of the control group and in favour of the post-test in the muscular strength of the arms and some physiological variables in freestyle swimming among swimmers of the Almajar Alkabir Sports Club on all variables. These differences were found at the level of significance (0.05), which is the level of significance that defines statistical significance. Table 5 displays the arithmetic mean, standard deviation, value of (t) calculated for samples, level of the test function sig, and significant differences for the control group in the pre- and post-test. The arithmetic mean of the pre-test of the mind during ten seconds was a value of 5.11, and the standard deviation was 0.82. The results of this analysis are presented in the table. The arithmetic mean of the post-test was a value of (5.82) and a standard deviation of (0.93) and the value of (t) for correlated samples amounted to (2.44) while the value of the level of the sig test function (0.001), which is smaller than the level of the function (0.05), which indicates that the differences were significant and in favour of the post-test. During the pre-test, we discovered that the arithmetic means of throwing the medical ball weighing one kilogramme had a value of 12.66, and the standard deviation was determined to be 1.07. For the post-test, the arithmetic mean was 13.31, the standard deviation was 0.91, and the value of (t) for the correlated samples was 4.08. The value of (t) was 4.08 for the correlated samples. Given that the value of the level of the test function sig was (0.003), which is lower than the level of the function (0.05), it may be concluded that the differences were statistically significant and that the post-test was the more appropriate option. Despite the fact that we discovered that the arithmetic means of the pre-test for throwing the medical

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ball (2 kg) were a value of 5.83 and a standard deviation of 1.04, the arithmetic mean of the post-test was a value of 7.08 and a standard deviation of 1.11, and the value of (t) for correlated samples was 3.55, we found that the arithmetic means of the post-test were more favourable. Regarding the significance of the level. Considering that the sig value of the test function was (0.004), which is lower than the level of the function (0.05), it may be concluded that the differences were statistically significant and favoured the post-test. During the pre-test, we discovered that the arithmetic means of tossing the medical ball, which weighed three kilogrammes, were a value of 3.22, and the standard deviation was 0.80. The arithmetic mean of the post-test was a value of 3.98, and the standard deviation was 0.73. The value of (t)For correlated samples was 3.53, and the value of the level of the test function sig was 0.001, which is lower than the level of the function (0.05). This indicates that the scalp was significant and in favour of the post-test. Overall, the results of the post-test were favourable. The arithmetic means of the pre-test were found to be 120, and the standard deviation was found to be 4.77. Furthermore, the number of heartbeats was found to have a value of 120. It was determined that the post-test had an arithmetic mean of 118, a standard deviation of 1.07, and a value of 3.84 for the value of t for the samples that were correlated with one another. Given that the value of the level of the test function sig was (0.005), which is lower than the level of the function (0.05), it may be concluded that the differences were statistically significant and that the post-test was the most appropriate option. Despite the fact that the arithmetic means of the pre-test for the number of breathing times were found to be (24.8) and the standard deviation was found to be (3.66), the arithmetic mean of the post-test was found to be (22.5) and the standard deviation was found to be (3.37), and the value of t for the correlated samples was found to be (3.84). Given that the value of the level of the test function sig was (0.005), which is lower than the level of the function (0.05), it may be concluded that the differences were statistically significant and that the post-test was the most appropriate option. While the arithmetic mean of the pre-test performance achievement was found to be a value of 33.44, the standard deviation was found to be approximately 3.8. A value of (32.29) was found to be the arithmetic mean of the post-test, while the standard deviation was found to be 2.70. Additionally, the value of (t) for the correlated samples was found to be 3.74. Given that the value of the level of the test function sig was (0.003), which is lower than the level of the function (0.05), it may be concluded that the differences were statistically significant and that the post-test was the more appropriate option.

Second: Results related to the second question

Are there statistically significant differences at the level of significance (0.05) between the pre- and post-tests among the members of the control group in the effect of the training program on the variable of muscle strength of the arms and some physiological variables and the achievement of performance 50 meters in free swimming among the players of the Al-Amara Sports Club?

To answer this question and identify the differences between the pre-and post-tests among the experimental group members, the researcher used the test (T) for the associated samples (Paired-T-Test) and the results of Table (5) illustrate this.

Table 4: Test results (T) to indicate the differences between the pre- and post-tests among the experimental group members in the muscular strength of the arms and some physiological variables and the achievement of performance 50 meters in free swimming among the players of Al-Amara Sports Club (N 6).

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Variables	Unit of measurement	Pretest		Posttest		T	Sig
		M	SD	M	SD		
Aqla during (10) T	Second	5.09	1.03	7.33	0.91	4.87	0.000
Throwing the good ball (1) kg	Kg	13.32	1.10	15.87	1.13	5.90	0.000
Throwing the good ball (2) kg	Kg	6.11	1.23	8.12	1.20	2.75	0.000
Throwing the good ball (3) kg	Kg	3.55	0.95	5.14	0.83	6.10	0.000
Heart rate	Number	74	5.21	114	3.95	4.34	0.000
Number of breaths	Number	14.5	4.05	21.9	3.43	5.26	0.000
Performance achievement 50 meters	Seconds\ Meters	33.76	4.12	30.60	2.96	6.08	0.000

There are statistically significant differences at the level of significance (a) (0.05) between the pre- and post-tests among the members of the experimental group. With regard to the post-measurement in the muscular strength of the arms and some physiological variables, as well as the achievement of performance 50 meters in freestyle among the players of Al-Amara Sports Club on all variables, the results of Table (4) indicate that there are statistically significant differences between the two tests. This is evident from the fact that the results of Table (5) are clear evidence of the fact that there are statistically significant differences between the two tests. Before and after the members of the control group and in favour of the post-test in the muscular strength of the arms and some physiological factors in freestyle swimming among swimmers of the Amara Sports Club on all variables, the results of the first and second tests were significantly different. Table (5) shows the arithmetic mean, standard deviation, value of (t) calculated for samples, level of the test function sig and significant differences for the control group in the pre- and post-test, where we find that the arithmetic mean of the pre-test of the mind during (10) seconds was a value of (5.21) and a standard deviation of 1.04. The arithmetic mean of the post-test was a value of (7.33) and a standard deviation of (0.91) and the value of (t) for correlated samples amounted to (2.44) while the value of the level of the sig test function (0.001), which is smaller than the level of the function (0.05), which indicates that the differences were significant and in favour of the post-test. When we look at the results of the pre-test, we discover that the arithmetic means of tossing the medical ball weighing one kilogramme were a value of 13.45, and the standard deviation was 1.10. In the post-test, the arithmetic mean was calculated to be 15.87, the standard deviation was found to be 1.13, and the value of (t) for the samples that were correlated was found to be 4.08. As a result of the fact that the value of the level of the test function sig was (0.003), which is lower than the level of the function (0.05), it may be concluded that the differences were significant and that the post-test was more favourable. According to our findings, the arithmetic means of the pre-test throwing the medical ball, which weighed two kilogrammes, were a value of 5.78, and the standard deviation was, in fact, six. A value of 8.12 was found to be the arithmetic mean of the post-test, with a standard deviation of 1.20. Additionally, the value of (t) for correlated samples was found to be 3.55. What about the significance of the level? The test function sig was

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(0.004), which is lower than the level of the function (0.05), which shows that the differences were significant and in favour of the post-test. The level of the function is 0.05. Despite the fact that the arithmetic means of the pre-test consisting of throwing the medical ball that weighed three kilogrammes were found to be 3.30, and the standard deviation was found to be 0.91, There was a value of 5.14 for the arithmetic mean of the post-test, and the standard deviation was 0.83. Additionally, the value of (t) was also present. The value of the level of the test function sig was (0.001), which is lower than the level of the function (0.05), which shows that the finding was significant and in favour of the post-test. The value found for correlated samples was 3.53, and the value of the level of the test function sig was (0.001). The arithmetic means of the pre-test for the number of heartbeats were found to be 120, with a standard deviation of 4.82. On the other hand, the arithmetic means of the post-test were found to be 114, with a standard deviation of 3.95. Furthermore, the value of (t) for the correlated samples was found to be 3.84 respectively. As a result of the fact that the value of the level of the test function sig was (0.005), which is lower than the level of the function (0.05), it may be concluded that the differences were significant and that the post-test was more favourable. The arithmetic means of the pre-test for the number of breathing times were found to be (24.6) and the standard deviation was found to be (3.56). On the other hand, the arithmetic mean of the post-test was found to be (21.9) and the standard deviation was found to be (3.43). Furthermore, the value of (t) for the correlated samples was found to be (3.84). As a result of the fact that the value of the level of the test function sig was (0.005), which is lower than the level of the function (0.05), it may be concluded that the differences were significant and that the post-test was more favourable. While the arithmetic mean of the pre-test performance achievement was found to be a value of 33.39, the standard deviation was found to be 3.17 during the course of our investigation. A value of (30.60) was found to be the arithmetic mean of the post-test, while the standard deviation was found to be 2.96. Additionally, the value of (t) for correlated samples was found to be around 3.74. As a result of the fact that the value of the level of the test function sig was (0.003), which is lower than the level of the function (0.05), it may be concluded that the differences were significant and that the post-test was more favourable.

Third: Results related to the third question

Are there statistically significant differences at the level of significance (0.05 in the telemetry between the members of the experimental and control groups in the effect of the training program on the variable of muscular strength of the arms and some physiological variables and the achievement of performance 50 meters in free swimming among the players of Al-Amara Sports Club and the Almajar Alkabir Club?

An Independent Samples T Test was employed to address this subject, and the findings of Table (6) demonstrate this.

Table 6: Test results (T) to indicate the differences in the post-test between the members of the experimental and control groups in the muscular strength of the arms and some physiological variables and the achievement of performance 50 meters in free swimming among the players of Al-Amara Sports Club and the Great Hungary Club

Variables	Unit of measurement	Control Group		Experimental		T	Sig
		M	SD	M	SD		
Aqla during (10) T	Second	5.82	0.93	7.33	0.91	4.98	0.000

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Throwing the good ball (1) kg	Kg	13.31	0.91	15.87	1.13	3.02	0.001
Throwing the good ball (2) kg	Kg	7.08	1.11	8.12	1.20	6.11	0.000
Throwing the good ball (3) kg	Kg	3.98	0.73	5.14	0.83	2.87	0.002
Heart rate	Number	118	3.84	114	3.95	3.65	0.000
Number of breaths	Number	22.5	3.37	21.9	3.43	4.98	0.003
Performance achievement 50 meters	Seconds\ Meters	32.29	2.70	30.60	2.96	6.13	0.000

Significance Level (2) (0.05), Tabular (C) (2.074), df (12).

The findings from Table 6 show statistically significant differences at a significance level of 0.05 in the post-test between the experimental and control groups. The experimental group members outperformed the control group in all aspects of arm muscular strength, physiological variables, and 50-meter free swimming performance among the players of Al-Amara Sports Club and Almajar Alkabir Sports Club.

First: Discussion of the results

Athletes from the Almajar Alkabir Club and the Al-Amara Sports Club participated in the study with the intention of determining the impact of a specified training regimen on the growth of one's arm muscular strength, physiological parameters, and performance accomplishments in the 50-meter free swimming event. The study was conducted on a sample that was purposely selected from both the Almajar Alkabir Club and the Al-Amara Sports Club for the 2018/2019 season. This was done in order to achieve the required results. A total of twelve swimmers were included in the sample, and they were split into two groups of similar size: the experimental group consisted of six swimmers, while the control group also had six swimmers. During the course of the training program's implementation, which lasted for a total of eight weeks, there were three training units scheduled annually. Assessments of both physical and mental capabilities were carried out both before and after the official launch of the training program. Following the completion of the data gathering process, the data was subjected to statistical analysis by means of the statistical packages software (SPSS). The findings of the study are presented in the accompanying discussion and are presented in the order of the questions that were asked.

1. **Analysis and interpretation of the findings question to the initial inquiry, which states:**

Are there statistically significant differences at the significance level (0.05) between the pre- and post-test among the control group members in the effect of the training program on the variable of muscle strength of the arms and some physiological variables and the achievement of 50-meter performance in free swimming among the players of the Almajar Alkabir Sports Club?

For the purpose of answering this question and determining the differences that existed between the pre-tests and the post-tests that were administered to the members of the control group, the researcher utilised the test (T) for the associated samples (Paired - Test), which is presented in Table (4). With regard to the strength of the muscular strength of the arms and some physiological variables, as well as the achievement of performance

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50 meters in freestyle among swimmers of the Great Hungary Sports Club, the results in Table (4) indicated that there were statistically significant differences between the pre- and post-tests among the members of the control group. These differences were found to be statistically significant at the level of significance (4) 2 0.05 in favour of the post-test. All things considered, the findings of this study were compared to the findings of the study that Mohamed (2013) conducted. (2008), Kamalkanan et al. (2010), and Ismail (2008)).Kamalakkannan et al.), as well as the research conducted by Aram and Asia (2011), whose findings demonstrated that the traditional program had a beneficial impact on the physical, physiological, and skill characteristics of the swimmers who were part of the control group. This effect was observable in the individuals who were part of the control group. The current study, as well as the researchers who conducted it, believe that the reason for this is due to the nature of the traditional program that was prepared by the trainer and the nature of its contents that were applied to them. Additionally, the regularity of training in addition to the practice of yard regularly that gives swimming a certain amount of fitness elements as they underwent training inside the water for eight weeks, which led to the improvement of all variables that were bei As for the rate of breathing times and the pulse rate, the difference between the groups was not significant with an error level of 1.15. This indicates that respiratory adequacy training over the course of eight weeks did not have a meaningful impact on either of these two variables.

2. **Discussion of the findings about the second inquiry, specified as:**

Are there statistically significant differences at the level of significance (0.05) between the pre- and post-tests among the experimental group members in the effect of the training program on the variable of muscle strength of the arms and some physiological variables and the achievement of performance 50 meters in freestyle swimming among swimrs of Al-Amara Sports Club?

Through the utilisation of the T test for the corresponding samples (also known as the Paired Test), the researchers were able to ascertain the differences that existed between the pre-tests and the post-tests that were administered to the individuals who were a part of the experimental group. According to the findings presented in Table 5, this is the case. Statistically significant variations in muscular strength of the arms, physiological variables, and performance achievement in 50 meters freestyle are presented in Table 5. These differences are statistically significant at a significance level of 0.0524. The participants of Al-Amara Sports Club were tested before and after the event. All of the physical and skill characteristics that were being investigated for this study revealed these variances. All of the physical and skill components have achieved a significant level of achievement, according to the information that was shown earlier. The implementation of the suggested training program on the individual within the experimental group is what the researchers believe to be the cause of this phenomena. Enhancing the component of muscular strength in the arms is the primary objective of the program. This is an essential component for improving the swimmer's performance and speed overall. For example, the arm motions are affected by around 70–15 percent of the pressures that are exerted by the patch, which is the component that is accountable for propelling the body ahead in the water while the Meals (2023) are being performed. Previous research carried out by Arslan, Orer, and Clemente (2020), Hadlow et al (2018), and Yuliandra Nugroho and Gumantan (2020) was consistent with the findings of this study, which were shown to be in agreement with those findings. Each and every one of these investigations unequivocally shown that the participants

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in the experimental group benefited from the training program that was suggested to them. In terms of the training methodology, the current study was distinct from the one that Cross et al. (2018) utilised. When compared to the current investigation, which was carried out with the control group at the German centre during the training period, Cross et al. (2018) utilised the training approach in the ground medium of the control group. **3. Discussion of the results related to the third question, which reads**

Are there statistically significant differences at the level of significance (0.05 in the post-test between the swimmers of the experimental and control groups after the training program on the variable of muscle strength of the arms and some physiological variables and the achievement of performance 50 meters in free swimming among the players of Al-Amara Sports Club and the Almajar Alkabir to answer this question and then use the test (T) for independent samples (T- Test), and the results of Table (6).

The findings that are provided in Table 6 demonstrate that there were statistically significant differences, at a significance level of 0.05, in the post-test scores between the swimmers who were in the experimental group and those who were in the control group. Additionally, there were disparities between the best swimmers belonging to the experimental group. All aspects of muscular strength of the arms, physiological variables, and the performance achievement in the 50-meter freestyle event were observed to be different among the players of Al-Amara Sports Club. These variances were observed. A number of researchers, including Charmas and Gromisz (2019), Karpiński et al (2020), Meggs and Chen (2019), Silva et al (2020), and Yadolahzadeh (2020), contributed to the findings that were achieved. When compared to the swimmers in the control group, the members of the experimental group who were given the opportunity to participate in the planned training program demonstrated much better outcomes. Through the use of a post-test, the researcher was able to demonstrate this improvement in the variables that were being evaluated. One possible explanation for the advantage that the experimental group possessed over the control group is that the experimental group had the opportunity to participate in a training program that was tailored just for them. The investigators state that there are differences that are statistically significant between the two groups in terms of the levels of muscular strength that were measured in the arms that were being investigated. It is possible that these differences are due to the fact that they participated in the planned training program, which is intended to develop arm muscle strength and, as a result, improve distance time. Discontinuation of the freestyle swimming competition for 50 meters. Based on the findings of Ikhwani (2021), it appears that the strength of arm muscles is the primary factor in determining speed when it comes to reaching a specific distance. There is a correlation between having a better anaerobic ability and having a shorter amount of time needed to complete the race distance. This discovery is consistent with the findings of Fone and van den Tillaar (2022), who established a correlation between the strength of the shoulder muscles and the amount of time it takes to travel a particular distance while engaging in resistance training. It is hypothesised by the researchers that the particular workouts that were performed resulted in an increase in the muscular capacity of the arms. Barbosa et al. (2023) emphasise that the exercises that are utilised to increase capacity development should retain a comparable level of activity and pace as those that are conducted in competition.

Conclusions

Based on the findings and subsequent analysis, the following conclusions can be drawn:

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1. The proposed training regimen yields a favorable outcome by clearly demonstrating the growth and strength of the arm muscles.
2. A statistically significant difference between the pre- and post-tests in favor of the post-measurement of certain physiological variables (the number of heartbeats and the number of breathing) indicates a favorable impact of the training curriculum on the ratio of these variables.
3. The training program implemented by the experimental group to enhance physical variables in the study significantly surpassed the performance of the conventional program.
4. Exercises involving rubber ropes have a relatively comparable impact on the muscular pressure seen during abdominal crawling swimming.
5. The efficacy of the suggested training intervention in enhancing physical and skill attributes, as well as muscular strength, among swimming players.

Recommendations

Considering the aims and findings of the study, the researcher endorses the following recommendations:

1. Assigning significant attention to the muscles of the arms during the development of training programs to directly enhance the level of achievement.
2. Sharing the findings of the present study with swimming coaches, and offering the values and references for measurements in academic assessment, training regimens, and training progress.
3. Implementing the suggested training program to enhance physical attributes in university students specializing in physical education and players with hoarseness.
4. Undertaking research of a comparable nature to the present study on different team and individual games. evaluate the efficacy of the suggested training regimen in enhancing the physical and skill aspects of players.
5. Performing ongoing medical physiological analyses both before and throughout the implementation of training programs to monitor the functional adjustment of essential organs.
6. Comparable research to the present study conducted on other age cohorts and encompassing both genders.

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