



P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (RJIIF): 5.38
IJPESH 2024; 11(3): 375-380
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<https://www.kheljournal.com>
Received: 17-02-2024
Accepted: 28-03-2024

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Impact of training with a designed device to develop arms power and its relationship to freestyle 50 meters achievement

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Abstract

Swimming training needs to be a good physical efficiency and skill must be the coaches to use devices, methods, methods and modern means and not rely only on the methods used in the training process. and the most important characteristic of the training devices in the field of physical education and sports science is the availability of the factor of suspense and excitement when preparing and is the proposed device subject of research of the training means that are believed to contribute to accelerating and facilitating the process of training and the correct performance of free swimming. The movement of the arms in freestyle swimming is the source of the driving force of the body and needs the characteristic of the distinctive force of speed as a key factor in covering the distance in the shortest possible time and thus improve time. The importance of the research is evident in the design of a training device outside the water on which special exercises are used for the movement of the arms to develop the ability of the arms of the players in the ground exercises outside the water. Research problem is finding alternative means and devices to practice movement and the same path and performance will help in continuity in training and non-interruption, so the research problem manifested the effect of training with a device designed in the development of the rapid strength of the arms and its relationship to the completion of 50 meters freestyle, as well as because of the apparent lack of swimming places for practical lessons in the faculties of physical education and sports sciences. As for the most important goals, they were the preparation of exercises in the training apparatus in developing the rapid strength of the arms and identifying the relationship between the rapid strength of the arms and the achievement of 50-meter butterfly swimmers. As for the research methodology, the experimental approach was with two experimental and control groups, and the research sample was the students of the swimming team at the university, and their number is (34) students, who represented the research community, and (20 students) were selected and divided into two control and experimental groups, while the results indicated the preference of the experimental group because I used the independent variable, which is the device, in the development of strength and achievement.

Keywords: Designed device, arms power, swimming, freestyle

1. Introduction

Swimming is one of the competitive individual games that have taken the forefront in terms of its spread in the world because it is characterized by the multiplicity of events and competitions, which are characterized by the spirit of competition between swimmers, and swimming depends on the correct technical performance as an important base on which this sport is built to progress in the level of performance, and freestyle swimming is one of the types of Olympic swimmers that exploit the water medium as a means of movement through both the movements of the arms, legs, trunk and breathing, in order to improve the efficiency of humans, not only physically And skill, but also psychologically and socially, but also mental, that swimming training needs to be a good physical efficiency and skill must be coaches to use modern devices, methods, methods and means and not rely only on the methods used in the training process. The most important characteristic of the training devices in the field of physical education and sports sciences is the availability of the factor of suspense and excitement when preparing and the proposed device subject of research of the training means that are believed to contribute to accelerating and facilitating the process of training and the correct performance of free swimming. The movement of the arms in freestyle swimming is

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the source of the driving force of the body and needs the characteristic of the distinctive force of speed as a key factor in covering the distance in the shortest possible time and thus improve time. The importance of the research is evident in the design of a training device outside the water on which special exercises are used for the movement of the arms to develop the ability of the arms of the players in the ground exercises outside the water.

1.1 Research Problem

The fast strength characteristic is one of the important qualities of the activities of the distance of 50 meters and the diversity of training and the selection of innovative devices and modern methods and methods that lead to the achievement of the goals that the training process seeks. And that the use of water training is not the only one to develop the special qualities of the arms and there are periods in which the Olympic swimming pools stop for the purposes of maintenance and restoration and these affect the swimmers and their training to find alternative means and devices to practice movement and the same path and performance will help in continuity in training and non-interruption. The problem of research manifested the effect of training with a designed device in the development of the rapid strength of the arms and its relationship to the completion of 50 meters freestyle as well as because of the apparent lack of swimming places for practical lessons in the faculties of physical education and science Sports, the researcher decided to summarize the research problem with two points:

1. The lack of training devices and means for the correct technical performance of the skill of freestyle outside the water.
2. Find training alternatives in the event that the real environment for the swimming lesson (swimming pool) is not available.

1.2 Research Objectives

1. Preparing exercises with the training device to develop arms power.
2. Identify the relationship between arms power and the achievement of 50 m butterfly swimmers.

1.3 Research Hypothesis

1. There are statistically significant differences between pre- post-test of the experimental and control groups in favor of the experimental group.

2. Research Methodology and Field Procedures

2.1 Research Methodology

The author chose the experimental approach with two experimental and control groups with pre- and post-tests to suit the nature of the problem to be addressed, "because experimental research is looking for the cause, and experimental research is characterized as the accurate and controlled scientific activity", and this is indicated by (Laila Khalil Daoud, 2001) that the experimental method is the most accurate research methods that reach scientific knowledge, and the following is the experimental design of the research:

Table 1: Shows the experimental design of the two research groups

Experimental group	Pre-test	Independent variable	Post-test	Pre-post-tests differences	Post-tests differences
		Training application by using the designed device			
Control group	Pre-test	The used method	Post-test	Pre- post-tests differences	Post-tests differences

2.2 Research community and sample

The research community included university students of the swimming team, for the academic year (2023-2024), and their number is (34) students, they represented the research community, and (20 students) were selected in a deliberate way and (5) students were selected to represent the exploratory experience from outside the research sample, and the female students were excluded and their number (3) students statistically, and after selecting the research sample,

they were divided into two groups (experimental) and (control) and by (10) students for each group, as the researcher chose in this type two equivalent groups in all variables and one of the two (experimental) groups of the experimental variable and leave the (control) group as it is in fact to the usual method followed and thus note the difference in performance attributable to the independent variable." Homogeneity was carried out for the research sample with indicators of age, mass and height as shown in Table (2).

Table 2: Shows the homogeneity of the research sample

Variables	Measurement units	Mean	Standard deviation	Torsion coefficient
Age	Month	236.4	17.1	0.24
Mass	Kg	69.6	2.01	0.58
Height	Cm	169.5	2.73	0.88

2.3 Methods, devices and tools used in research

2.3.1 Methods used in research:

The author used the means through which he could obtain the data and information required to solve his problem and achieve the objectives of his research, and for this the researcher used:

1. Arab and foreign sources.
2. International Information Network (Internet).
3. Personal interviews with experts and specialists.
4. Registration and data dump forms.
5. Assistant staff.

6. Statistical means.

2.3.2 Devices and tools used in research

1. Designed training device.
2. 25-meter metal tape measure (Estan Estan) Japanese type.
3. Medical scale with a ruler to measure height and weight, number (1).
4. Nikon video camera Japanese-made, number (2).
5. Dell laptop calculator, 1 number.
6. Whistle type (ACME), number (1).

this.



Fig 4: Illustrates

2.4.2 Research Tests

The author used the standardized scientific tests for swimming and for the research variables, which are as follows:

1. Free swimming from the fixed position using the arms only for (20) seconds (Haider Iyad: 2004: p. 107)

Purpose of the test: Measurement of arms power of swimmer.

Tools: Mounting plate, registration form, electronic stopwatch, fixing device (rubber cord, belt)

Test description: The swimmer wears a swimmer fixing device consisting of (belt, rubber rope) around the waist area, which is installed on the outer edge of the swimming pool, then the swimmer goes down to the water and then puts the kicking plate (buoyancy board) between the thighs to prevent the movement of the two men, as the swimmer floats and prepares waiting for the absolute whistle and after hearing the whistle, swimming begins at maximum and for a period of (20) seconds.

Registration: The distance traveled during the test time is recorded for the swimmer.

2. Freestyle (50) meters achievement test. (Ali Salloum Jawad al-Hakim: 2004: p. 107)

Purpose of the test: Measuring the time of covering a distance of (50) meters at maximum speed.

Tools used: Stopwatch and whistle.

Performance Description: The swimmer stands on the start board (START) with the standby for it, and when the whistle is heard, the swimmer jumps into the water trying to cover the distance at full speed until reaching the final edge of the mentioned distance.

Recording: Minute, second and parts of distance.

2.4.3 Exercises used

The training curriculum included a period (8 weeks) and was during the special preparation stage that precedes the competition stage, and by (3) units per week were days (Sunday, Tuesday, Thursday) and thus the total training units (24) The tests were conducted on the palm swimming pool in Diyala Governorate, where the two groups were working simultaneously on either the control group was in the light of the curriculum prepared by the team coach and the training units were according to the following procedures:

- The training unit is divided according to the three sections of the unit, which are the preparatory, main and final sections.
- The duration of one training unit ranged between (90-120) minutes, as the share of the preparatory section was (15) minutes and the main section between (80-90) minutes, the exercise share on the device was (30-35) minutes, and the final section (5) minutes.
- The total time of training in the main section in minutes during the two months (800).
- The training method used was interval training (high and low intensity) and the method of repetitive training in the development of strength characteristic of speed.
- Training intensity is adopted based on time and number of repetitions.

2.5 Statistical Procedures

The author used the appropriate statistical procedures to process the results of the research through the special statistical program within program system (SPSS).

3. Results Presentation and Discussion

3.1 Presentation mean, standard deviations, and (t) value for the post-tests of the experimental and control groups

Table 3: Presentation mean, standard deviations, and (t) value for the post-tests of the experimental and control groups

Variables	Control group		Experimental group		Calculated (t)	Significance
	M.	Std	M.	Std		
Arms power test for (20) seconds	18.40	0.18	17.43	0.41	3.50	Sig.
Freestyle (50) meters achievement test	26.13	0.28	26.60	0.34	3.96	Sig.

Tabular score (2.44), significance level (0.05%) and freedom n-2

3.2 Presentation and discussion of simple correlation to device training and its relationship to arms power achievement tests

Table 4: Shows the calculated (r) for the experimental group and its relationship to the achievement of 50 m

Statistical Processes	Calculated value (r)	Tabular value (r)	Significance
Experimental group arms power test	0.98	0.90	Sig.

Error rate 0.05% with N-2 freedom

Table 5: Shows the calculated (r) for the control group and its relationship to the achievement of 50 m

Statistical Processes	Calculated value (r)	Tabular value (r)	Significance
Control group arms power test	0.91	0.90	Sig.

Error rate 0.05% with N-2 freedom

3.3 Results Discussion

Table (3) shows the difference between exercises with the device used and the traditional exercises for each of the training and through the results that became clear and through the differences in the arithmetic means that show the development was in favor of training with a device and this is what he referred to (Muhammad Reda 2008: p. 617.) that training devices similar to movement with a better and faster development of physical qualities than the rest of the other exercises. Through Table (4) and (5), which shows the simple correlation coefficient for the rapid strength tests of the arms for both the training on the device and the exercises used, it became clear that there is a correlation for both methods in the rapid strength test of the arms. By looking at the calculated value (t) was the highest value in the exercises used in the device compared to the significance of the traditional training reading. And that morale that appeared to the arms is what was confirmed by Muhammad Ali al-Qat 2006: p. 108. The sport of freestyle, which confirms that the momentum and movement of the swimmer depends on a high rate of up to 90% to the arms of freestyle compared to the legs on achievement.

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Appendices

Appendix (1)

Model of Training session

Session No. (4)

Session time (30) minutes.

Sections	Time	Exercises	Exercises time-Sec.	Exercise rep.	Rest between rep.	Rest between groups	Notes
Main section Exercises using the device	30 min.	Exercise 1	30 sec.	4	30 sec.	1 min.	Using arms motor speed while maintaining the kinetic path
		Exercise 2	30 sec.	4	30 sec.		
		Exercise 3	30 sec.	4	30 sec.		
		Exercise 4	30 sec.	4	30 sec.		
		Exercise 5	30 sec.	4	30 sec.		
		Exercise 6	30 sec.	4	30 sec.		
Total		6 Exercises	180 sec.	24 rep.	180 sec.	6 min.	

Appendix (2)

A model of some of exercises used on designed:

Exercise 1: Performing arm movements on the device alternately



Exercise 2: Perform reverse reciprocal arm movements on the device



Exercise 3: Performing arm movement with trunk movement with working arm



Exercise 4: Performing the breathing movement with water with the arm exiting once to the right and the other to the left



Exercise 5: Performing movements of the arms and legs and breathing at the same time

