The importance of research lies in the development of physical and physiological performance and the development of swimming skills, including the skill of rotation speed, which allows for work and improvement in various sports. Recognizing the number of heartbeats, number of breaths and lactic acid (the subject of the study) after performing the playing exercises, will help those in charge of the training process to understand the foundations of those variables and then know how to develop training curricula and make the necessary modifications to them to ensure continuous development and improvement in the level of achievement of the players. Because these variables have a direct and basic relationship in developing the skill of spinning speed, hence the importance of the research that includes studying the effect of special exercises and an innovative device to develop some physiological variables and spin speed and the achievement of swimming 400 meters for young people.

The aim of the research is to:

Manufacturing an innovative device to develop the skill of rotational speed and some physiological variables, and the completion of a 400-meter freestyle swim for young people.

Preparing special exercises and an innovative device in developing the skill of rotational speed and some physiological variables and completing a 400-meter free swim for young people.

Identifying the effect of the innovative device and special exercises in developing the skill of spinning speed and some physiological variables, and the achievement of 400-meter free swimming for young people.

The most important conclusions reached by the researcher are:

The use of special exercises and an innovative device, directly and significantly affected the effectiveness of the swimmers' performance, which led to the development of physiological variables and rotational speed and the achievement of the 400m freestyle swimming for young people.

A clear development in the skill of rotation as a result of the use of the innovative device.

The application of flexibility exercises at the beginning of the main section contributed to a clear development in the research variables, as this characteristic constitutes (80%) of the swimmers' exercises.

The results achieved by the tests proved the validity of the training units prepared by the researcher through the clear development in the research variables.
Special exercises and an innovative device have achieved a better development than the approach followed by the trainer, thus achieving the goals and objectives that were set in order to achieve them.

1. INTRODUCING THE SEARCH

1-1 Introduction and importance of the research:
The modern era has been characterized by scientific progress in all areas of life, which came as a result of the efforts of scientists and researchers in different sciences so that people benefit from their applications in overcoming the problems that obstruct the march of scientific progress. Various levels. Studies and research related to swimming have recently increased in order to find and invent the means and methods to achieve achievement, within the scope of participation in local, international and Olympic tournaments, as it is one of the games through which the largest number of medals can be obtained.

And the swimming game is one of the individual games that has been widely spread in the world, as in the rest of the individual games, the swimming game has turned from a game that includes fun, joy, pleasure and leisure time, to a game of competitions for higher levels to achieve new records through high skill performance as well as high fitness. In order to reach a good level of performance, the coach must prepare the swimmer from all sides, so attention must be paid to developing physical and physiological performance and developing swimming skills, including the skill of rotation speed by developing exercises based on a scientific programmed planning so that we can reach good performance. Therefore, the importance of the exercises in terms of quality, quantity and how they are performed should be taken into consideration in order to provide the swimmer with special motor abilities and technical performance in free swimming.

Special exercises are among the important exercises for developing physical fitness, technical performance and physiological variables such as heart rate, lactic acid and respiratory system because of their effect on increasing the swimmer's motivation because of the excitement and suspense they contain. To develop the skill of rotation, the performance of the free swimming game requires the swimmer to move both the head, arms and legs together simultaneously and in different directions or motor paths according to the type of swimming, which requires a good level of motor compatibility (nervous-muscular), so we must search for the latest methods of learning these types.

Physiological variables are one of the necessities of developing physical capabilities, and thus achieving good numbers in Olympic swimming activities, including the 400-meter freestyle swimming activity for young people, as this activity is characterized by the necessity of movement of the arms and legs simultaneously, provided that there is a high compatibility in the movement of the limbs. The upper and lower ones with the need to exit the head from the water after the end of each cycle with the arms to take the inhale and then the head enters the water to exhale, which certainly leads to the occurrence of some adaptations in some physiological indicators of the respiratory system, the number of heartbeats and lactic acid for swimmers.

The rotational speed is one of the main factors affecting the speed of the swimmer in covering the distance and achieving a better time during the race. Thus, the importance of the research lies in the effect of special exercises and an innovative device for the development of some physiological variables and rotation speed and the achievement of 400-meter free swimming for young people.

1-2 Search problem

Through the researcher’s follow-up to training units for the skill of rotation, he noticed that there is a difficulty in the technique of rotation skill in terms of the method of performance, speed and technical performance of most club players, and this negatively affects the level of performance of the swimmer and his failure to reach the level of achievement in the skill of rotation of the swimmer, and this is a limit. It is a problem that the researcher seeks to solve.

Therefore, the researcher decided to define the research problem with the following question: Does the innovative device, accompanied by special exercises, have an effect in developing:

- Rotation skill
- Physiological variables
Reducing the swimmer's completion time in the 400-meter freestyle swim

Research aims

Manufacture of an innovative device in developing the skill of rotation speed and some physiological variables, and the achievement of a 400-meter freestyle swim for youth

Preparing special exercises and an innovative device in developing the skill of spinning speed and some physiological variables, and completing a 400-meter freestyle swim for young people.

Identifying the impact of the innovative device and special exercises in developing the skill of rotational speed and some physiological variables, and the achievement of 400 free swimming for youth

Research assumes:

There is a positive effect of the innovative device and special exercises in developing the skill of rotation and some physiological variables, and the achievement of 400-meter free swimming for young people

Research areas:

Human field: Baghdad club swimmers, youth category for the season (2020-2021)

Time domain: From the moment of the university order 12/20/2020 to approve the topic to the extent of the scientific concept

Spatial domain: Al Shaab's indoor swimming pool in Baghdad

Chapter III

II. RESEARCH METHODOLOGY AND FIELD PROCEDURES

3-1 Research Methodology:-

It is the path that the researcher takes to achieve his goals based on a set of rules and foundations, perhaps the most important of which is knowing the nature of the problem under study, which requires the researcher to choose the appropriate approach to reveal the truth at hand.

The researcher used the experimental method, in the manner of two equal groups (with a pre- and post-test) to suit the nature of the problem to be solved; Because "the most important characteristic of accurate scientific activity is the use of the experimental method" (1) and Table (1) shows the experimental design used.

<table>
<thead>
<tr>
<th></th>
<th>Post test</th>
<th>Experimental treatment</th>
<th>Pretest</th>
<th>group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiological</td>
<td>Physiological variables: rotational</td>
<td>Experimental approach</td>
<td>Physiological variables: rotational</td>
<td>experimental</td>
</tr>
<tr>
<td>variables:</td>
<td>speed and achievement of 400m</td>
<td>special exercises and an innovative device</td>
<td>speed and achievement of 400m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>freestyle swim.</td>
<td></td>
<td>freestyle swim.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Physiological variables: rotational</td>
<td>Normal syllabus</td>
<td>Physiological variables: rotational</td>
<td>Controller</td>
</tr>
<tr>
<td></td>
<td>speed and achievement of 400m</td>
<td></td>
<td>speed and achievement of 400m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>freestyle swim.</td>
<td></td>
<td>freestyle swim.</td>
<td></td>
</tr>
</tbody>
</table>

Experimental physiological variables rotational speed and completion of a 400m freestyle swim Experimental method Special exercises and an innovative device Physiological variables speed of rotation and completion of a 400m freestyle swim

Control of physiological variables, rotational speed and achievement of a 400m freestyle swim, the regular curriculum Physiological variables: rotational speed and achievement of a 400m freestyle swim .

3-2 The research community and its sample:
The research community was identified with young swimmers in the Police Sports Club, who numbered (22) swimmers for the season (2021), (6) swimmers were taken for the exploratory experiment, while the main research sample was (16) swimmers, and they were divided into two equal groups, the first experimental and by (8) swimmers, and the second is control, with (8) swimmers using the simple random method.

3-3 Research means, devices and tools used:

3-3-1 Research Methods:
The researcher used the following research methods:

Arab and foreign references and sources.
The Internet (International Information Network).
Tests and measurement.
Observation and experimentation.
resolution.

3-3-2 Equipment and tools used:

Innovative device for developing the speed of rotation.
Medical scale to measure body weight.
Manual electronic calculator, type 402kk Enako, 1 number.
Computer-Laptop

4 Field Research Procedures:-

3-4-1 Identification of some physiological variables and their tests:

After the researcher was discussed with the approval of the research topic by the Scientific Committee, and the researcher obtained the approval to conduct the research on the youth of the Police Sports Swimming Clubs in Baghdad Governorate, the researcher worked on identifying each of the following:

Physiological variables.

Physiological variables tests.

The researcher relied on determining some physiological variables, rotation speed, and the achievement of a 400-meter freestyle swim for youth

3-5 characterization of the tests:

1- Breathing test
The purpose of the test: to identify the number of breaths per minute.

Test tools: using the hand and a stopwatch.

- Description of the test: The respiratory rate of the research sample is measured through the manual method, where the hand is placed on the chest and the finger is in front of the nose of the laboratory. The number of exhalations per minute is measured using a stopwatch, and the number of exhalations per minute represents the number of breaths of the laboratory.

Scoring method:
The number of breaths per minute.
Number of breaths per minute
2- Heart rate test

Resting heart rate test for young swimmers.

Test objective: To measure the heart rate per minute.

Test tools:
1- An electronic pulse oximeter that is placed in the index finger, after which the result can be read.
2- A chair in which the player sits in a comfortable position
3- Data registration form

Test description: The player sits comfortably on the chair and puts his hand on the chair cushion and then puts the device in the index finger and after a minute the result can be read

Scoring method:
Measuring the number of heart beats per minute.

The number of heart beats per minute

3- Rotational speed test

Purpose: The test is to measure the speed of rotation.

Description of the test: The swimmer performs the spin skill while swimming 400m freestyle.
Calculation method: The swimmer is photographed and then kinematic analysis is performed to extract the rotation time.

4- A test of achievement in the 400m freestyle swimming for young people

Purpose of the test: to develop achievement.

Test description: 400m freestyle swim

Calculation method: the time recorded by the swimmer.

3-5 main research procedures:

3-5-1 Tribal tests:

The researcher conducted tribal tests for tests of physiological variables and rotation speed and the completion of 400m free swimming for the research sample during the two days of Sunday and Monday and on (14-15/2/2021) and at exactly 9 am in the Olympic swimming pool in the governorate of Baghdad. Its members (8) swimmers on Monday, while the tests were conducted for the control group, which numbered (8) swimmers on Saturday.

3-5-2 Special exercises:

The researcher prepared special exercises with auxiliary means to develop some physiological variables and rotational speed and to achieve 400 m freestyle, as shown in the following points:
The duration of the exercises took (8) weeks from (15/2/2021) to (15/4/2021).

The number of educational units is (3) units per week, and the total number is (24) educational units.

The time of the educational unit is (90) minutes, according to the training curriculum.

The time of the main section of the educational unit is (60) minutes, the time of the preparatory section is (20) minutes, and the time of the closing section is (10) minutes.

Special exercises are performed only in the main section of the training unit.

These exercises include a gradual increase in stress, as it was done with a change in the form of performance, as the researcher relied on this increase and change in form in order to develop physiological variables and speed of rotation and to complete the 400m freestyle.

3-5-4 Post-tests:

The researcher conducted dimensional tests for physiological variables, rotational speed, and the completion of the 400m freestyle. After completing the period of carrying out the exercises for the research sample for the experimental group on Thursday (10/6/2021), then the researcher conducted tests for the control group on Friday (11/6/2021), and these tests were conducted in circumstances close to the circumstances and conditions that took place. The tribal tests.

3-6 Statistical means:

The statistical bag (spss) was used in analyzing the research data and using the following statistical methods, which fit with the sample size. - median - quartile deviation - Mann-Whitney test

Wilcoxon test - Spearman's correlation coefficient for ranks

The fourth chapter:-

1-4 Presentation, analysis and discussion of the results:

The researcher presented, analyzed and discussed his findings to verify the objectives and hypotheses of the research in knowing the effect of special exercises and an innovative device for the development of some physiological variables, rotational speed and the completion of a 400-meter freestyle swim for young people aged (15-18) years.

2-4 Presenting the results of the differences between the tribal and remote tests for the most important physiological variables, rotational speed and achievement in the 400-meter freestyle swimming for the control group and their analysis:

For the purpose of achieving the objectives of the research, the researcher collected tribal and posterior data for tests of the most important physiological variables, rotation speed, and achievement for a 400-meter free swim for young people for the two research groups. Central tendency and dispersion, and in order to know the significant differences between the pre-test and the post-test for the control group, the researcher used the Wilcoxon test. As shown in Table (4).

Table (4)

It shows the values of the median and the quartile deviation of the tribal and dimensional tests of some physiological variables, rotational speed, achievement of 400m freestyle swimming for youth, the calculated Wolkoxin value and its statistical significance for the control group.
<table>
<thead>
<tr>
<th>g</th>
<th>n</th>
<th>0.01</th>
<th>2.51</th>
<th>0.90</th>
<th>30</th>
<th>0.65</th>
<th>35</th>
<th>Number</th>
<th>Number of breaths</th>
<th>Heart of rate</th>
<th>Mel/Liter</th>
<th>Lactic acid</th>
<th>Rotational speed</th>
<th>Complet 400m Freestyle swim</th>
</tr>
</thead>
<tbody>
<tr>
<td>moral</td>
<td>1</td>
<td>0.01</td>
<td>2.46</td>
<td>0.5</td>
<td>167</td>
<td>0.64</td>
<td>180</td>
<td>number</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>moral</td>
<td>2</td>
<td>0.02</td>
<td>2.23</td>
<td>0.37</td>
<td>9.5</td>
<td>0.68</td>
<td>10</td>
<td>Lactic acid</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>moral</td>
<td>3</td>
<td>0.02</td>
<td>0.27</td>
<td>0.52</td>
<td>4</td>
<td>0.43</td>
<td>5</td>
<td>th</td>
<td>Rotation speed</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moral 5</td>
<td>4</td>
<td>0.01</td>
<td>2.58</td>
<td>0.46</td>
<td>4.2</td>
<td>0.5</td>
<td>4.5</td>
<td>d</td>
<td>Comple 400m Freestyle swim</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**T-tests Unit of Tri-dimensional Measurement Wolkoxen Value Significance Level Morale Significance**

**median interquartile deviation median interquartile deviation**

1 Number of breaths Number 35 0.65 30 0.90 2.51 0.01 Significant

2 Heart Rate Number 180 0.64 167 0.5 2.46 0.01 Significant

3 Lactic acid mmol/L 10 0.68 9.5 0.37 2.23 0.02 Significant

4 s rotational speed 5 0.43 4 0.52 2.27 0.02 significant

5 Swimming Achievement 400m Freestyle D 4.5 0.5 4.2 0.46 2.58 0.01 Morale

n = 8 below the significance level (0.05)

By looking at Table (4), which shows the value of the median and the quartile deviation of the tests under discussion, and through our observation of these indicators, we see that they are different in value and amount with regard to the pre and post tests, and this indicates a development in the post test.

3-4 Presenting the results of the differences between the tribal and remote tests of the most important physiological variables, rotation speed and achievement in the 400-meter freestyle swimming for the experimental group and their analysis:

For the purpose of achieving the objectives of the research, the researcher collected tribal and posterior data for tests of the most important physiological variables and rotation speed for the two research groups, and for the purpose of describing the results of the sample members, he processed them statistically using nonparametric statistics for the purpose of identifying these data, and the median and quartile deviation were extracted as indicators of central tendency and dispersion, and in order To know the significance of the differences between the pre-test and the post-test for the control group, the researcher used the Wilcoxon test. As shown in Table (5). table(5)

It shows the median and quartile deviation values of the tribal and dimensional tests of some physiological variables, rotational speed, achievement of 400m freestyle swimming for youth, the calculated Wolkoxin value and its statistical significance for the experimental group.

www.turkphysiotherrehabil.org

16600
By looking at Table (5), which shows the value of the median and the quartile deviation of the tests under discussion, and through our observation of these indicators, we see that they are different in value and amount with regard to the pre and post tests, and this indicates a development in the post test.

4-4 Presenting the results of the differences between the two groups (control and experimental) in the post-tests of the most important physiological variables, spin speed and achievement in the 400-meter freestyle swimming and their analysis:

After collecting data from the post-test for tests of the most important physiological variables, rotational speed and achievement of a 400-meter freestyle swim for the two research groups (control and experimental), the researcher processed the data statistically using measures of central tendency and dispersion, and for the purpose

<table>
<thead>
<tr>
<th>The moral sign</th>
<th>Indication level</th>
<th>Wilcoxon value</th>
<th>dimensional</th>
<th>tribal</th>
<th>Measuring unit</th>
<th>Number of tests</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>moral</td>
<td>0.01</td>
<td>2.51</td>
<td>0.90</td>
<td>30</td>
<td>0.65</td>
<td>35</td>
<td>Number of breaths</td>
</tr>
<tr>
<td>moral</td>
<td>0.01</td>
<td>2.46</td>
<td>0.5</td>
<td>167</td>
<td>0.64</td>
<td>180</td>
<td>Number of breaths</td>
</tr>
<tr>
<td>moral</td>
<td>0.02</td>
<td>2.23</td>
<td>0.37</td>
<td>9.5</td>
<td>0.68</td>
<td>10</td>
<td>Measured with Lactic acid</td>
</tr>
<tr>
<td>moral</td>
<td>0.02</td>
<td>0.27</td>
<td>0.52</td>
<td>4</td>
<td>0.43</td>
<td>5</td>
<td>Rotational speed</td>
</tr>
<tr>
<td>Moral 5 6</td>
<td>0.01</td>
<td>2.58</td>
<td>0.46</td>
<td>4.2</td>
<td>0.5</td>
<td>4.5</td>
<td>Completed 400m free style swim</td>
</tr>
</tbody>
</table>

T-tests Unit of Tri-dimensional Measurement Wollcoxon Value Significance Level Morale Significance

median interquartile deviation median interquartile deviation

1 Number of breaths 35.5 0.62 28 0.46 2.54 0.01 Significant
2 Heart Rate Number 179 0.37 166 0.56 2.63 0.008 Significant
3 lactic acid mmol/L 10.25 0.62 9 0.62 2.71 0.007 Significant
4 s rotational speed 4 0.5 3 0.55 2.62 0.01 significant
5 Swimming Achievement 400m Freestyle D 4.2 0.56 3.5 0.46 2.55 0.01 Moral

n = 8 below the significance level (0.05)
of knowing the significant differences between the two research groups, the researcher used the Mann and Tenney test as shown in table (6).

<table>
<thead>
<tr>
<th>The moral level</th>
<th>Indicational value</th>
<th>Wilcoxon value</th>
<th>Median</th>
<th>Interquartile deviation</th>
<th>Measuring unit</th>
<th>Number</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>moral</td>
<td>0.01</td>
<td>2.51</td>
<td>0.90</td>
<td>30</td>
<td>Number</td>
<td>3</td>
<td>Significant</td>
</tr>
<tr>
<td>moral</td>
<td>0.01</td>
<td>2.46</td>
<td>0.5</td>
<td>167</td>
<td>Number</td>
<td>4</td>
<td>Significant</td>
</tr>
<tr>
<td>moral</td>
<td>0.02</td>
<td>2.23</td>
<td>0.37</td>
<td>9.5</td>
<td>Meli/liter</td>
<td>5</td>
<td>Significant</td>
</tr>
<tr>
<td>moral</td>
<td>0.02</td>
<td>0.27</td>
<td>0.52</td>
<td>4</td>
<td>th</td>
<td>6</td>
<td>Significant</td>
</tr>
<tr>
<td>Moral 5 6</td>
<td>0.01</td>
<td>2.58</td>
<td>0.46</td>
<td>4.2</td>
<td>Complete 400m free style swim</td>
<td>7</td>
<td>Significant</td>
</tr>
</tbody>
</table>

It shows the value of the median and the quartile deviation of the dimensional tests of the two research groups (experimental and control).

And the calculated Mann Whitney value, the level of significance, and the moral significance

T-tests Unit of measurement Control group Experimental group Mann value and T Level of significance
Significance

median interquartile deviation median interquartile deviation

1 Respiration Number 30 0.90 28 0.46 0.00 0.00 Significant
2 Heartbeat Number 167 0.5 166 0.56 0.00 0.00 Significant
3 mmol/L lactic acid 9.5 0.37 9 0.62 0.00 0.00 Significant
4 s rotational speed 4 0.52 3 0.55 0.00 0.00 significant
5 Swimming Achievement 400m Freestyle D 4,2 0.46 3,5 0.46 0.00 0.00 Morale

n1 = 8, n2 = 8 below the significance level (0.05)

By looking at Table (6), which shows the value of the median and the quartile deviation of the tests under consideration, and through our observation of these indicators, we see that they are different in value and amount with regard to the pre and post tests, and this indicates a development in the post-test, that is, the one who
observes the median for both groups. He sees that there is a difference and a difference between them. To clarify the reality of these differences, the researcher used the nonparametric test (Mann Whitney), and after performing the statistical treatments, the calculated Mann Whitney value reached (0.00) at the significance level (0.00), and this indicates significant differences between them and in favor of the experimental group.

Chapter Five:-

III. CONCLUSIONS AND RECOMMENDATIONS

5-1 Conclusions:-

In light of the results of the tests, their analysis and discussion, the researcher reached the following conclusions:

The use of special exercises and an innovative device, directly and significantly affected the effectiveness of the swimmers’ performance, which led to the development of physiological variables and rotational speed and the achievement of the 400m freestyle swimming for young people.

A clear development in the skill of rotation as a result of the use of the innovative device.

The application of flexibility exercises at the beginning of the main section contributed to a clear development in the research variables, as this characteristic constitutes (80%) of the swimmers’ exercises.

The results achieved by the tests proved the validity of the training units prepared by the researcher through the clear development in the research variables. Special exercises and an innovative device have achieved a better development than the approach followed by the trainer, thus achieving the goals and objectives that were set in order to achieve them.

5.2 Recommendations: -

Based on the conclusions reached by the researcher, he recommends the following: Benefiting from the special exercises and the innovative device prepared by the researcher in this study by the swimming coaches. Applying exercises on land during the training units as it contributes to the development of the various motor abilities of the swimmer and according to his swimming specialization without focusing only on exercises inside the swimming pool because it will also work to keep the athlete away from boredom.

Emphasis on the application of kinetic flexibility exercises during the warm-up and at the beginning of the main part of the training unit and according to the goal of the training plan. Studies similar to this study use exercises and other aids.

Conducting a study similar to this study on other swimming activities as well as on other age groups.

SOURCES