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Maximum strength of legs pushing to the axial rotation skill and its relationship to the 100 m breaststroke achievement for juniors

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Abstract
The performance of rotation is one of the important skills and has importance in the achievement in the types of swimmers and is characterized by rotation in breaststroke with kinetic and technical performance that enters into the daily training of swimmers, because the correct rotation accomplished by the player earns him greater progress than his peers in fractions of a second and because swimming is one of the digital games, so it is important to follow up and identify all the details of performance from the moment of beginning to the end and highlights the importance of research in identifying the maximum force to push the two legs in the skill of rotation The axial and its relationship to the achievement of swimming 100 m breaststroke. The research problem revolves around that when rotating in the race, the work of the two men has the largest role in the forces that shed on the wall of the swimming pool and what has to do with the forces that shed on the results of that force inside the water after rotation and flow inside the water for the largest possible distance and in the shortest possible time Where the problem of research lies in identifying that maximum force by the two men outside and inside the water by rotation and to identify their relationship to the achievement of swimming 100 breaststroke and in order to emphasize the interest in the training of the maximum forces of the two legs in swimmers, especially when rotating for swimmers. The objectives of the research was to prepare a test to measure the force of the axial rotation entered the water and to identify the maximum strength of the two men inside the water either the research approach used the researcher descriptive approach with correlation relations either the research sample was the players of the youth team swimming and their number (6 players) and they represent 60% of the original community of 11 swimmers and the results indicate a relationship of strength for the axial rotation and the completion of swimming 100 meters breaststroke.

Keywords: Maximum strength, axial rotation, skill, breaststroke

1. Introduction
Swimming is one of the most popular sports in the world because of the large number of practitioners, which is not limited to a specific age group, and rotation is one of the important skills and has importance in achievement in the types of swimmers, and the rotation in breaststroke is characterized by motor and technical performance that enters into the daily swimmers' training, because the correct rotation accomplished by the player earns him greater progress than his peers in fractions of a second and because swimming is one of the digital games, so it is important to follow up and learn about all the details of the performance from the moment The beginning to the end and the force is the main and basic element in sports and the output of the force is the speed and the uses of force vary according to the use of effectiveness and performance time, hence the importance of research in identifying the maximum force to push the two men in the skill of axial rotation and its relationship to the completion of swimming 100 m swimming on the chest.

1.1 Research problem
The muscular strength and its output is one of the success of most sports and knowing whether the maximum force of the legs is important in the flow of the body after rotation because the axial rotation depends on pushing the legs to the wall of the pelvis, and this is the reason for working inside the water while we see that when rotating in the race the work of the legs has

the largest role in the forces that shed on the wall of the swimming pool and what has to do with the forces that affect the results of that force inside the water after rotation and flow Inside the water for the largest possible distance and the least possible time, where the problem of research lies in identifying that maximum force by the two men outside and inside the water by rotation and to identify their relationship to the achievement of swimming 100 breaststrokes and in order to emphasize the interest in the training of the maximum forces of the two men among swimmers, especially when rotating for swimmers.

1.2 Research objectives
1. Preparing a test to measure strength of axial rotation in water.
2. Identify the maximum strength of the legs in the water.
3. Identify the relationship between the legs maximum strength in water and achievement time of breaststroke 100 meters.

1.3 Research hypothesis
There is a statistically significant relationship between legs maximum strength in water and breaststroke swimmers (100) meters achievement.

2. Research methodology and Field procedures
2.1 Research methodology
The researcher used the descriptive approach in the style of correlation relations to suit it with the research problem.

2.2 Research community and sample
The author used a sample of juniors team swimming players (6 players), who represent 60% of the original community of 11 swimmers, freestyle and back swimmers were excluded because they do not use the axial rotation and the butterfly and breaststroke swimmers remained.

2.3 Tools and devices used
1. Water foot scanner.
2. Distance measuring tape.
3. Canon camera.
4. Stopwatch.
5. Data form.

2.4 Tests used
Most of the tests that measure the strength of the two legs are located outside the water and the author has chosen a modern standardized measurement method to measure the maximum force or the force of pushing the two men inside the water, which is the foot scanner device (Foot Scan) to give real data to the reality of the game simulated for real performance.

2.5 Foot scan device
It is a device made to identify the variables of strength and pressure imposed by the foot that press on the platform and is used for scientific, sports, and therapeutic purposes, and there are several types of it that differ in measurement, namely:
- Metric foot scanner.
- Two-meters foot scanner.
- Half metric foot scanner.
- Water Half Metric Foot Scanner.

These devices are different lengths, but similar in terms of width and thickness, they are (40 cm) wide and thick (1 cm), and there are two types of these devices, the first is equipped with a USB connection in which the device is linked to the computer, because its work is linked to its own program that is downloaded to the computer and this program can be run on all the measurements mentioned above, and Figure (1) shows this type.

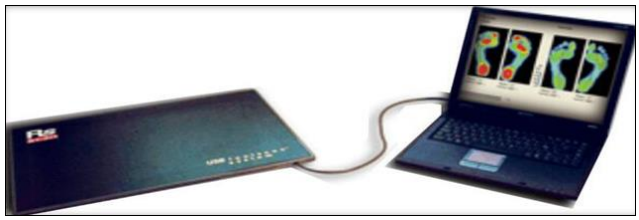

Fig 1: Shows the foot scanner device with computer connection

2.6 Exploratory experiments
The researcher conducted two exploratory experiments for the purpose of determining the accuracy and validity of the work and identifying the obstacles that will be faced during the main experiment procedures, as well as training on how to do the experiment procedures better in order to increase the accuracy of the measurement and the results that will be obtained.

2.7 Tests used
The researcher used the standardized achievement test and entered the amendment, which is the addition of the means of measurement of the maximum force through the water foot scanner device at the end of the first 50 meters of the completion distance of 100 meters, where the device was placed inside the water on the wall of the basin at a distance of 50 cm below the surface of the water so that when performing the rotation of the swimmer and wrapping the body and the payment process is done on the platform installed on the end of the rotation wall to give the amount of push force in newtons for each swimmer separately has been taken ray Experts and specialists about the modification of the test as well as conducting peaceful scientific foundations for it.

2.7.1 100 m breaststroke achievement test using the foot scanner
Objective of the test: Measuring the time of 100 meters breaststroke and axial rotational force.

Tools used: Stopwatch, Whistle: 50-meter pool.

Test method: The laboratory stands at the standing platform and when hearing the word (your place) from the divorcee, he takes the starting position and waits to hear the whistle of the divorcee, and when he hears the whistle, he jumps from the platform to the water and travels a distance of 100 meters by performing breaststroke and at full speed, in order to record the least possible time.

Recording: Records the time it took the swimmer to finish a distance of 100 meters as well as the force applied in newton when rotating.

2.8 Scientific foundations of tests
2.8.1 Test objectivity
In order to demonstrate the truthfulness of the tests, the researcher used the sincerity of the content, as the truthfulness of the content aims at the extent to which the test represents the phenomenon or subject.

Which is intended to be measured. The tests were presented to specialists and experts, and the answer of specialists with the validity of the tests in measuring strength was under study. In order to ensure the validity of the tests, the researcher calculated the coefficient of self-truthfulness, which is related to the coefficient of stability of the test.

2.8.2 Test Stability

The researcher chose the method of testing and re-testing to find the stability coefficient of the test and under the same conditions in which the first test was conducted as the re-test after seven days of the main experiment, and this is what he pointed out (Marwan Abdul Majeed Ibrahim) that "to know the stability of the test is re-applied after seven days of the first test" (2). If the researcher used the simple correlation coefficient (Pearson) to find out the correlation between all tests, and the results showed that it has a high degree of stability. As shown in Table 1.

Table 1: Shows the coefficient of stability and honesty of test

Test	Stability coefficient	Subjective honesty
Axial rotational strength measurement	0,95	0,97

2.8.3 Objectivity

The tests in the research were easy and understandable by the sample members, and since the tests used in the research far from self-evaluation as the registration was calculated strength quantitatively with a codified electronic device, so the tests used are highly objective.

2.9 Statistical procedures

The author used the statistical bag program SPSS to extract the statistical results of the research variables

3. Results presentation and discussion

3.1 Results presentation of the 100 breaststroke test to measure axial rotational strength

Table 2: Shows the values of the median, mean, standard deviation and torsion coefficient of the results of measuring the strength variable of axial rotation in swimming (100) meters breaststroke

Axial rotational	Measurement test	Mean	Median	Standard deviation	Torsion coefficient
strength	Newton	761.67	745.00	-0.59133	0.615

Table 3: Shows coefficient correlation between the 100-breaststroke swimming achievement and maximum strength of axial rotation

Statistical procedures variables	Measurement test	Mean	Standard deviation	Calculated correlation coefficient	Significance
Achievement	Sec.	75.0833	0.72778	-0.943**	High
Strength	Newton	761.67	0.59133		

3.2 Results discussion of correlation relations between research variables of maximum strength, and achievement of the types of Olympic swimmers

Through the results that appeared for the research variables studied for each of the force and their relationship to the achievement of 100 meters backstroke we found that there is a high correlation between strength and achievement through the results we found that the link inversely bin maximum strength and time of achievement for breaststroke, and the researcher attributes that the greater the strength had an impact on the increase in speed and since the speed is measured by time, the relationship is inverse. Also, continuing with the perfect technical performance during the competition time is also one of the important reasons for not losing strength. "Because increasing the speed of short-distance swimmers is achieved in increasing the amount of driving force produced by developing the mechanics of strikes and recruiting the largest number of muscle fibers during effort" [1]. As pointed out by Osama Kamel Rateb and Ali Mohamed Zaki, "The only way to help the swimmer to continue the momentum is to increase the speed of his arms to push the water back" that "speed increases with increasing muscular strength, because any sports movement requires an amount of thrust that is the link of speed with force, so it is necessary to develop the force in order to increase the speed" [2].

4. Conclusion

Swimming's widespread popularity spans all age groups, with rotation being a crucial skill for competitive swimmers. Proper breaststroke rotation can significantly enhance a swimmer's performance by crucial fractions of a second. Understanding the maximum force applied during rotation is vital, as it directly impacts a swimmer's speed and efficiency. This study aimed to identify the relationship between leg strength during axial rotation and performance in the 100-meter breaststroke. Using a foot scanner device, the research measured the push force in water and found a significant inverse correlation between maximum leg strength and race time. This underscores the importance of strength training for swimmers to improve their rotational efficiency and overall performance.

5. References

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