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# *The Effect of Strength Training on the Level of Handstand Performance on the Junior Floor Movement Mat*

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## *ABSTRACT*

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**Keywords**:
***Strength Exercises - Standing Motions - Juniors.***

The importance of the research lies in the preparation of strength exercises (explosive strength of the arms – force characterized by speed for the legs) and the effect of these exercises on the skill level of the player in the movement of standing on the hands on the floor movement of the juniors and thus improving the general skill level of the player, because the sport of gymnastics requires a great deal of strength and the movement of standing on the hands is a basic base for many movements on other devices.

Thus, it is possible to achieve a scientific benefit for the coaches and to the specialized centers of gymnastics as well as the sub-federations in the game of gymnastics.

The purpose of the research was to identify the effect of strength training on the level of handstand performance on the floor movement mat device for juniors.

The researcher reached a set of conclusions, the most important of which are:

An improvement in both the explosive power of the arms and the characteristic speed of the legs directly affects the improvement of the posture of the hands.

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**- Introduction to the research**

**1-1 Introduction and Importance of the Research:**

The process of sports training is an important means of moving the player from one situation to another because it works on the development and integration of the player in all aspects for the purpose of reaching the desired goal or the level to be reached, and sports training has many concepts and have been circulated by many scientists and specialists to clarify what sports training is, that the sports achievements achieved in various sports are the result of the combination of several interrelated and complementary factors to each other, such as realistic planning, the provision of scientific training staff, and the use of training means to develop The physical, skillful, and psychological aspects of that game, and the development of training curricula that suit the player's ability, and reaching athletic achievements that satisfy the ambition of both coaches and players.

The exercises that the coach sets for one player or for the players are many within special rules for the development of the player physically, skillfully, and strategically. Special exercises are the exercises that affect the technical performance to develop the ability of players with the speed and strength required by the gymnast to interfere with basic skills, physical and even psychological qualities and their foundations. [1]

Gymnastics is one of the sports that rely heavily on physical qualities to meet the requirements of this sport, and these qualities are strength and speed that form a large part of movements and on all devices, especially ground movements, because they have a great impact on improving the level of technical performance of many movements.

The term strength refers to the ability of an individual to exert muscular strength and the possibility of using it, which is the basic physical attribute that determines the individual's adequacy in athletic performance, and the use of force varies from one sport to another according to the requirements of performance, and strength is the most important element of the necessary physical variables through which the athlete excels, and can be the most important element of athletic performance. [7]

The importance of the research lies in knowing the effect of strength exercises on improving the performance of the obese standing movement on the floor movement of the juniors.

**1-2 Research Problem:**

Sports training has become a science that works to raise the training status of the athlete, through which the levels of the players are affected towards positivity and achieve advanced and distinguished results, and thus the use of targeted exercises is intended to raise the level of the players and achieve achievements in the future, especially when these exercises are used with young young people and in games that require high physical and skill qualities, as happens in gymnastics. Paying attention to the juniors is the cornerstone of this sport, as well as considering this stage as one of the most important stages of training, so we must pay attention to them and prepare them correctly based on scientific foundations. Through the work of the academic researcher and as a coach in the training centers and observing the weakness of the level of the players in the movements that are considered the cornerstone of the kinetic chain in gymnastics, his work is to introduce strength exercises that are intended to raise the physical condition of the

players, and consequently the level of performance of the movements, including the movement of standing on the hands.

**1-3 Research Objectives:**

1- Identifying the effect of strength exercises on the level of performance of the standing movement on the floor movement mat for juniors.

**1-4 Imposing the Research:**

1- There are statistically significant differences between the pre- and post-tests in the level of performance of the handstand movement on the floor movement mat for juniors.

**1-5 Research Areas:**

**1.5.1 Human Field: Athletes** for the Specialized Center for Gymnastics in Samawa.

**1-5-2 Temporal Domain: Period** from 20 / 6 / 2023 to 5 / 9 /2025

**1.5.3 Spatial Field: Sawa** Gymnastics Hall in Samawa **.**

**Research Methodology and Field Procedures**

**2-1 Research Methodology:**

"The experimental method is the closest research method to solving problems in the scientific way, as it is an attempt to control all the basic variables and factors except for one or more variables that the researcher changes in order to determine and measure its scientific impact." []

The researcher used the experimental method and the design of (the two equal groups) control and experimental to suit the nature of the problem to be solved, and it is required that the groups be completely equal.

**2-2 Research Population and Sample:**

The research population consisted of the players of the Specialized Center for Gymnastics in Samawa (Savah Center / Junior Category) The researcher selected his research community by the deliberate method consisting of (8) players who meet the research conditions, and then the sample was divided into two control and experimental groups, each of which has four players by random method using the lottery method, and players selected to the exploratory experiment, and all the sample members are of the same age group, which are juniors (10-13) years old and with a training age of one year.

**2-3 Research Methods, Devices and Tools Used:**

**2.3.1 Research Methods:**

1- Arab and foreign sources and references.
2- The Internet.
3- Tests.
4- Personal interviews ·
5- Note.

**2.3.2 Devices and Tools Used:**

1- Simple.
2- HP type computer.
3- Electronic stopwatch.
4- Whistle.
5- Medical ball.
6- Camera

**2-4 Field Research Procedures:**

**2.4.1 Identification of variables:**

The researcher has carried out a set of scientific steps through which the researcher was able to identify the research variables as shown below:

1. The researcher is informed of many sources, references, and previous studies.
2. Conducting personal interviews with specialists in the sport of gymnastics and some experienced professors in this field.

Accordingly, the types of strength associated with the skill were selected and tested.

As for the skill, the skill (standing on the hands) on the floor movement mat was determined, in order to enter the skill into the curriculum used in the center.

**2.4.2 Description of the Tests:**

**First: Handstand Skill Test:**

**Purpose of the test:** Measuring the skill performance of standing on the hands.

Tools used: Rugs, (1) camera, tripod, numbered papers, whistle.

Performance method: A camera is placed at a distance of (4) meters from the laboratory, and after the start whistle, the laboratory performs a hand-standing movement, as each student is given two attempts and the best one is chosen by the specialists.

Calculation of the Grade:

The performance of each student was presented to four specialists in the subject of gymnastics for the purpose of evaluating the technical performance, and the researcher excluded the highest grade and the lowest grade, and the researcher adopted the arithmetic mean of the middle two grades, and a special form was made to facilitate the task of the referees, knowing that the final grade is (10).

**Second: Explosive Force Test** [8]

**- Test (2 kg medical ball throw with hands)**

**Objective:**Measuring the explosive force of the arms and shoulders.

**Tools used:**

Hardware and tools: medical ball (3 kg), measuring tape, chair with strap to secure the torso securely on the chair.

Performance Method:

The tester sits on the chair and holds the medical ball in his hand from above the head and the torso adjacent to the edge of the chair, the belt is placed around the stem of the lab and tied to the back edge of the chair for the purpose of preventing the tester from moving forward while

throwing the ball with the hands, so that the ball is thrown with the hands without the use of the torso

Registration: Each lab is given three attempts and the best of them are scored

Third: Speed Strength Test for Legs [5]

**Knee flexion and extension test in 20 seconds**.

- Objective of the test: Measuring the force of speed of the legs.

-Instruments: Stopwatch.

- Conducting the test:

From a standing position, bend and extend your knees completely in a time of twenty seconds.

**Registration**:

The number of times in a time of (20) seconds.

**2-5 Exploratory Experiment:**

For the purpose of determining the accuracy and validity of the research work, and to avoid the obstacles that may appear when conducting the main experiment, and to know its efficiency, and to determine the performance of the devices used and to test them, the researcher, with the help of an assistant team, conducted the reconnaissance experiment on a group of (3) center players on Tuesday , 29/6/2023, and on the center hall, and the experiment showed the following:

1. Suitability of devices and tools used in tests.
2. The testers' readiness to take the test.
3. Identify and avoid errors that occur during the execution of the main experiment.
4. The adequacy of the support staff in performing their task during the conduct of the tests.
5. Knowing the time it takes to conduct and execute the test.

**6.2 Research Procedures:**

**2.6.1 Exercises**

- The application of the exercises used took (8) weeks, with (3) training units per week (Sunday, Tuesday, Thursday), (24) training units with a time limit of (90) minutes for the allocation of (**14-32**) minutes for the exercises used, and the capabilities, level and physical ability of the research sample were taken into account, and the exercises used were applied to the experimental group, while the control group applied the vocabulary of the training curriculum followed by the trainer.

**2.6.2 Pre-Tests:**

The researcher conducted the pre-tests on Friday , 1 / 7/ 2023 at the hall of the Specialized Center for Gymnastics in Samawa, the test of explosive power and the distinctive force by speed was conducted, and then the skill performance of the (standing on the hands) movement was tested on the floor movement mat device, and the researcher relied on evaluating the level of the player's skill performance by photographing the performance of each player from the research sample and then presenting it to four of the Those with experience and specialization in the field of gymnastics to evaluate the movements, and after the evaluation, the researcher excluded the

upper and lower grades for each student, and then the arithmetic mean of the two middle grades for the evaluators was extracted.

2.6.3 Work of the control and experimental groups:

The research sample was divided into two groups, and each group performed its work as follows:

Control group: This group applied the existing exercises in the curriculum prescribed by the center coach and was training in the gymnastics hall in the center.

Experimental group: The experimental group used the required movement in its training on the days allocated to it by two units per week and using exercises to develop the explosive power of the arms and the force characterized by speed of the legs, and this exercise was prepared in cooperation between the researcher and some of the specialists.

2.6.3. Post-tests:

The researcher conducted the post-tests on the research sample on Sunday , 29/ 8 / 2023 in the hall of the Specialized Center for Gymnastics in Samawa, and used the same tools, devices, conditions, and method in which the pre-test was carried out.

**2-7 Statistical Methods:**

The obtained data were processed using a number of statistical methods that are compatible with the objectives of the study to reach the results through the use of the statistical package (SPSS).

**3- Presenting, analyzing and discussing the results:**

**This chapter deals with presenting, analyzing, and discussing the research results.**

**3-1- Presenting, analyzing and discussing the results of the differences in the values of physical and skill variables:**

**3.1.1. Presenting, analyzing and discussing the results of the differences in the values of physical and skill variables of the pre- and post-tests of the control group:**

Table ( 1 )

Shows the differences in the pre- and post-tests in the physical and skill variables of the control group

| Significance Level | T Calculated | Post-testing | | Pre-test | | Variables |
|---|---|---|---|---|---|---|
| | | on | Going to | on | Going to | |
| **0.04** | **2.54** | **1.78** | **10.39** | **0.99** | **8.35** | Explosive power of the arms |
| **0.03** | **2.82** | **1.51** | **12.00** | **1.04** | **10.25** | Leg speed power |
| **0,01** | **7,00** | **1,11** | **5,38** | **0,95** | **3,63** | Handstand |

In the light of the data extracted for the research sample members, Table (1) shows the differences in the values of some physical and skill variables in the pre- and post-tests of the control group, and as shown in the table above, the nature of the sample members showed a difference in the differences between the pre- and post-tests of the control group.

In the explosive power of the arms, using the (T) test of the correlated samples to extract the differences, they showed significant differences, where their calculated value was (**2.54**) at the significance level of (**0.04**) and the degree of freedom (3) between the pre- and post-tests of the control group and in favor of the post-test.

While the force characterized by the speed of the two men and using the (T) test of the correlated samples showed significant differences, as its calculated value was (**2.82**) at the significance level of (**0.03**) and the degree of freedom (3) between the pre- and post-tests of the control group and in favor of the post-test.

As for the hand-standing movement and using the (T) test of the correlated samples to extract the differences, it showed significant differences where its calculated value was (7.00) at the significance level of (0.01) and the degree of freedom ( 3) between the pre- and post-tests of the control group and in favor of the post-test.

By observing the values (t) shown in Table (1) of the variables of the explosive force of the arms, the force characterized by the speed of the legs, and the movement of standing on the hands, it was found that it showed a difference in the differences between the pre- and post-tests of the control group and in favor of the post-test. The researcher attributes the reason for this development to the method used by the trainer in the control group, as this approach included some different exercises to develop (explosive power and force characterized by speed), and that following any training can lead to the development of These variables when following exercises are proportional to the type of effectiveness and can have no development or relatively when the training is relatively less.

This is confirmed by Muhammad Ali Al-Qatt from "Focused sports training through which the desired goals can be achieved by reaching the athlete to the best levels" []

**3.1.2. Presenting, analyzing and discussing the results of the differences in the values of some physical and skill variables of the pre- and post-tests of the experimental group:**

Table ( 2 )

Shows the differences in the pre- and post-tests in the physical and skill variables of the experimental group

| Significance Level | T Calculated | Post-testing | | Pre-test | | Variables |
|---|---|---|---|---|---|---|
| | | on | Going to | on | Going to | |
| **0.03** | **2.83** | **0.99** | **12.03** | **1.83** | **9.73** | Explosive power of the arms |
| **0.04** | **2.59** | **1.81** | **13.88** | **2.39** | **11.00** | Leg speed power |
| **0,00** | **7,83** | **0,41** | **8,00** | **1,19** | **4,25** | Handstand |

In the light of the data extracted by the research sample members, Table (2) shows the differences in the values of some physical and skill variables in the pre- and post-tests of the

experimental group, and as shown in the above table, the nature of the sample members showed significant differences between the pre- and post-tests of the experimental group.

In the explosive power of the arms, using the (T) test of the correlated samples to extract the differences, they showed significant differences where their calculated value was (**2.83**) at the significance level of (**0.03**) and the degree of freedom (3) between the pre- and post-tests of the experimental group and in favor of the post-test

While the force characterized by the speed of the two legs and using the (T) test of the correlated samples showed significant differences, as its calculated value was (**2.59**) at the significance level of (**0.04**) and the degree of freedom (3) between the pre- and post-tests of the experimental group and in favor of the post-test.

As for the hand-standing movement and using the (T) test of the correlated samples to extract the differences, it showed significant differences, as its calculated value was (7.83) at the significance level of (0.00) and a degree of freedom (3) between the pre- and post-tests of the experimental group and in favor of the post-test.

It was found by observing the values of (t) in Table (2) of the variables of the explosive force of the arms, the force characterized by the speed of the legs, and the movement of standing on the hands, that it showed significant differences between the pre- and post-tests of the experimental group.

This indicated an increase in the explosive power of the arms and the velocity of the legs in the experimental group. The researcher believes that the reason for this development is due to the exercises used by the researcher that the team coach applied by supervising the application of these exercises, and this is in line with the principles of sports training that indicate that training programmed according to scientific foundations has a positive effect on the trainee individuals. Training is [a] constructive process that develops and develops physical abilities to achieve a certain achievement. []

The reason is also due to the development of the muscles of the arms as a result of the use of exercises, as it led to the stimulation of the necessary muscle fibers, which led to the development of these qualities, because the muscle when exposed to an influencer, it is either affected in its entirety or part of it may be affected, this depends on the distinctive intensity, in addition to this, these exercises were effective and directed, and (Been) states that strength improves as a result of regular training, especially if this training contains weights suitable for the abilities of the players with the gradual progression in these Loads according to the improvement of their abilities . [12]

Special exercises use the development and development of the correct performance of special motor skills in gymnastics, as these special exercises contain a quality similar to the basic technical performance of the exercise. [6]

**3.1.3. Presenting, analyzing and discussing the results of the differences in the values of physical and skill variables in the post-test of the control and experimental groups:**

Table ( 3 )

Shows the differences between the control and experimental groups in the post-tests of some physical and skill variables

| Significance Level | T Calculated | Experimental Group | | Control Group | | Variables |
|---|---|---|---|---|---|---|
| | | on | Going to | on | Going to | |
| **0.04** | **2.27** | **0.99** | **12.03** | **1.78** | **10.39** | Explosive power of the arms |
| **0.04** | **2.25** | **1.81** | **13.88** | **1.51** | **12.00** | Leg speed power |
| **0.00** | **4.44** | **0,41** | **8,00** | **1.11** | **5.38** | Handstand |

In the light of the data extracted by the members of the research sample, Table (3) shows the differences in the values of some physical and skill variables in the post-test of the control and experimental groups, and as shown in the above table, the nature of the sample members showed significant differences between the control and experimental groups in the post-test.

In the explosive power of the arms, using the (T) test of the independent samples to extract the differences, it showed significant differences where its calculated value was (**2.27**) at the level of significance (**0.04**) and the degree of freedom (6) between the control and experimental groups in the post-test and in favor of the experimental group.

While the force characterized by the speed of the two legs and using the (T) test of the independent samples showed significant differences, as its calculated value was (**2.25**) at the significance level of (**0.04**) and the degree of freedom (6) between the control and experimental groups in the post-test and in favor of the experimental group.

As for the hand-standing movement, there were differences between the control and experimental groups, where the value of (T) reached (4.44) at the level of significance (0.00) and the degree of freedom (6), which indicates the significance of the differences between the control and experimental groups in the post-test and in favor of the experimental group.

By observing the values of (t) shown in Table (3), it is clear that some physical and skill variables, namely the explosive power of the arms, the force characterized by the speed of the legs, and the movement of standing on the hands, as they showed significant differences between the control and experimental groups in the post-test and in favor of the experimental group.

The researcher attributes these differences between the control and experimental groups in some physical and skill variables to the exercises that were used for the experimental group

In addition, the intensity of the training used had an impact on this development, as it did not aim to increase the intensity of the exercise performance, and therefore the volume decreased as the positive rest increased, but it remained incomplete. [11]

Marwan Abdel Majeed confirms that strength and speed are among the most important physical abilities in gymnastics.10 []

This means that the exercises used in the curriculum by the researcher have achieved a better improvement than the method followed by the trainer, as these movements need specificity in learning and adjusting them in terms of educational steps and training to perform correctly, and this is what the (LNB) mechanism pointed out that the principle of privacy in education and

training means that education and training include movements similar to the nature of performance in the practiced activity.[13]

The use of new exercises in an organized and continuous manner and for a period of time leads to the development of the optimal performance of these movements, and this is what (Qasim Hassan and Abd Ali) said that the level of athletic achievement rises rapidly during the use of new exercises that the athlete is not used to and carries special doses. [4]

**4.1 Conclusions:**

**In light of the researcher's findings, he came to the following conclusions:**

1- The exercises used had a positive effect on the development of the explosive power of the arms.
2- The exercises used had a positive effect on the development of the strength of the legs.
3- An improvement in both the explosive power of the arms and the characteristic strength of the speed of the legs directly affects the improvement of the movement of the hand-standing.

4-2 **Recommendations:**

**In light of the conclusions reached by the researcher, he recommends the following:**

1- Use exercises that develop the level of explosive power of the arms for players because they help improve the skill level.
2- Use exercises that develop the strength level of the legs as fast for the players, as they help improve the skill level.
3- Emphasizing the importance of using modern means in training in order to reach objective results in order to serve the skill level of the players.
4- Coaches should do a lot of similar skill exercises because of their importance in developing a player's level in movements.
5- Conducting a similar study in other devices as well as other age groups (applicants).

**Sources**

[1] Thamer Mohsen and Wathiq Naji: Special Games in Football Training , (Baghdad, Central Company for Printing and Media, 1975).

[2] Sami Mohamed Melhem: Research Methods in Physical Education, 1st Edition, Amman, Dar Al-Masra for Publishing and Distribution, 2000.

[3] Suleiman Ali Hassan, Introduction to Sport Training, Mosul, Mosul University Press, 1983.

[4] Qasim Hassan and Abd Ali: Principles of Sport Training, 1st Edition, Baghdad, Higher Education Press, 1988.

[5] Qais Naji Abdul-Jabbar and Bastoisi Ahmed: Tests, Measurement and Principles of Statistics in the Field of Sport (University of Baghdad, University of Baghdad Press, 1987).

[6] Mohamed Ibrahim Shehata: A Guide to Modern Gymnastics, Alexandria University, Dar Al-Ma'arif, 1992.

[7] Mohamed Hassan Allawi: The Psychology of Training and Competitions (Cairo, Dar Al-Ma'arif, 1983).

[8] Mohamed Hassan Allawi, Muhammad Nasr Al-Din Radwan: Motor Performance Tests, 3rd Edition (Cairo, Dar Al-Fikr Al-Arabi, 1994).

[9] Muhammad Ali Al-Qat. Sport Physiology and Swimming Training , Arab Center for Publishing, Vol. 2, Cairo, 2002.
[10] Marwan Abdul Majeed, Muhammad Jassim Al-Yasiri, Modern Trends in Sport Training, Al-Warraq Press, Amman, 2004.
[11. ] Mufti Ibrahim Hammad, Modern Sports Training, Planning, Application and Measurement, 1st Edition, Dar Al-Fikr Al-Arabi, Cairo.

[12] Been.C: the effect of depth jumpand weight traing on errtical jump research uarterly sport medicine 1994 .
[13]. Lanb. D. physical of Exercise. Respo- use and Adaptaions Mac Mill on publishing New York. 1984.

**Appendix No. (1)**
**Training module model**

| Total time for an exercise | Comfort between groups | Rest between repetitions | Collection | Repetition | Performance Time | Exercises Used | Unit Departments |
|---|---|---|---|---|---|---|---|
| 5.30m | 1.30D | 1D | 3 | 2 | 15th | Rope climbing exercises by opening the legs and joining them | Main Section |
| 7d | 1D | 1D | 3 | 3 | 20s | From the front support position (Shanaw) with the legs above high and the arm opening shoulder-width apart, the exercise is | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | performed by bending and extending the arms while maintaining the leg position. | |
| 7.40m | 1D | 40 seconds | 3 | 3 | 30s | Deep oblique reclining held by fellow walking hand forward | |
| 8.30m | 1.30D | 30s | 3 | 3 | 30s | Attach to the stairs and pass them by hand, and the stairs are 1.5 m high and 1 m long | |
| 6.20m | | | | | | Performance of hand-holding by players | |