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# The impact of strength training activities on treatment of the a nterir deltoid muscle of the shoulder joint in junior wrestlers

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**Abstract**. Preparing exercises according to the principle of torque is one of the new things that works to rehabilitate the injured working muscles and the effectiveness of this joint. Through the researcher's follow-up of the game of wrestling and his work in the field of rehabilitation and physical therapy, he noticed that most of the wrestling players suffer from pain in the shoulder joint despite their visit to the doctor. The specialist took the treatment, so the researcher decided to study this problem and restore the recovery of the injured through strength training exercises according to an appropriate rehabilitation program for the muscles of the shoulder joint. The aim of the research is to Preparing exercises according to the principle of torque is one of the new things that works to rehabilitate the injured working muscles and the effectiveness of this joint For junior wrestling players, the researcher assumed that there are statistically significant differences between... The three tests (pre-medial and post-test) for qualification The anterior deltoid muscle of the shoulder in the research sample The experimental approach was used in a single group design on a sample of junior wrestling players. Special tests were used to measure the degree of pain, the range of motion of the arm, and to test the maximum strength of the arm. After applying the rehabilitation approach for strength training, the researchers reached a set of conclusions, the most important of which is Exercises had a positive effect on the relief of pain for people with shoulder joint injuries in the research sample. Momentum training led to an improvement in the range of motion, and the improvement in the range of motion of the shoulder joint was associated with the disappearance of pain and led to a clear improvement in the range of motion.

**Keywords**. strength training, Treatment shoulder joint, wrestling

## Introduction:

Shoulder joint injury is one of the most common injuries that wrestling players suffer due to the nature of this game and the high physical and skill capabilities it requires, as there are many injuries to ligaments and muscle tendons, as the shoulder joint is one of the joints that is relied upon in all skills that require the use of the upper limb of the body (Mahmood et al., 2023), and joint injuries, including the shoulder joint, are among the injuries that are related to high effort, as the shoulder joint is one of the synovial joints that has a wide range of motion in various directions, especially in some games in which the player uses the arm to perform the motor duty, including Wrestling game (Salman et al., 2022) and these movements are linked to the integrity of the ligaments, muscles, and capsule located in the shoulder joint, and this

requires that the strength of these muscles be the main problems for these players due to the nature and requirements of these skills (Jawad Kadhim, M., & Salman Ahmed, 2016), so it is very important to take into account the rehabilitation exercises when preparing them so that they are very appropriate according to the skill performance related to the working moments of these muscles. The shoulder joint is a typical ball-and-acetabular joint (acetabular ball joint), which means that the head of the humerus is completely spherical and rests in the glenoid fossa. The shallow depth of the shoulder bone and this glenoid fossa deepens slightly due to the presence of a circular bundle of fibrocartilaginous tissue surrounding it (Kzar & Kadhim, 2020). Given the importance of this for those injured in the joint, as it is the joint that contributes a large proportion to the instantaneous movement of the throwing arm, so preparing exercises according to the principle of moments is one of the matters. The new method that works to rehabilitate the injured working muscles and the effectiveness of this joint (Kadhim, 2012), and through the researcher's follow-up of the game of wrestling and his work in the field of rehabilitation and physical therapy, he noticed that most of the wrestling players suffer from pain in the shoulder joint despite their visit to the specialist doctor and taking treatment ( Son et al., 2022) Therefore, the researcher decided to study this problem and restore the recovery of the injured through strength training exercises according to an appropriate rehabilitation program for the muscles of the shoulder joint. The aim of the research is to Preparing exercises according to the principle of torque is one of the new things that works to rehabilitate the injured working muscles and the effectiveness of this joint For junior wrestling players (Easa et al., 2022) The researcher assumed that there are statistically significant differences between... The three tests (pre-medial and post-test) for qualification The anterior deltoid muscle of the shoulder in the research sample. In this field, many studies have been conducted in this field, including a study that aimed to prepare special physical exercises for young volleyball players and to know the effect of physical exercises on developing the torque of the arms among young volleyball players. The study found a significant development in the torque variable for the arms as a result of the exercises. . (Fadel et al., 2021)

**Method**

The experimental approach was used with a single experimental group design The experimental method is a method that the researcher follows to achieve a goal he seeks. (Khalil, 2011) As for the research sample, it was represented by junior wrestling players, numbering (6) players who were intentionally selected from those who suffer or have injuries in the shoulder joint, as they were diagnosed by a specialist doctor. The researchers used a group of means of collecting information, including the Internet, Arabic sources, testing and measurement, devices and tools. Search them Shoulder wheel. A wooden runway for practicing finger walking on the wall. Calibrated medical scale for measuring weight. A device for measuring length. Goinometer device to measure the range of motion of the joint. The multicam device, and various gymnastics devices. The research tests and measurements included the following:

First: A test to measure the degree of pain based on the clinical examination. The pain degrees were as follows (Nassif, 1980).

1. Pain during rest (1 degree).
2. Pain when moving the arm up to the side at an angle (60 degrees - 2 degrees).
3. Pain when moving the arm up to the side at an angle (90 degrees - 1 degree).

Thus, the total pain score is (4 degrees).

Second: A test to measure the range of motion of the arms:

1. Adduction test: It is the movement of any part of the body close to the deep axis of the body, such as bringing the arm closer to the longitudinal axis of the body, and the degree of flexibility is (0-90 degrees).

2. Dimensional test: The degree of flexibility is (0 - 180 degrees) and the dimensions are starting from placing the arm next to the body (zero position). The movement is free to the farthest point from the torso and upwards, that is, the deltoid muscle (middle fibers), the supraspinatus muscle, and the biceps brachii muscle participate. (long head) in this movement (Aqel, 1989) .

Third: Testing the strength of the muscles at the moment of throwing: using the multitool device, where the pull handle is held as it is when preparing for throwing and pulled to the maximum possible resistance.

Recording: The laboratory records the number of weights in kilograms that the injured person overcomes when pulling. The researcher conducted the pre-, mid- and post-tests for these tests for each individual separately, according to the sequence of review of the injured and the history of their injury.

Before starting the main experiment, the researcher conducted a pilot experiment for the rehabilitation program according to strength training exercises on a sample of (2) patients with shoulder injuries for the period (12/1/2021) until (1/25/2022) to ensure the suitability of the devices, tools, and auxiliary personnel and to know the severity. The volume and frequency of exercises.

The researchers conducted the first pre-test on 1/27/2022, the first intermediate test on 2/13/2022, and the first post-test on 3/1/2022.

AndThe researchers prepared physical exercises specifically to rehabilitate the working muscles of the shoulder joint and according to the type of injury. These are resistance exercises with rubber ropes, pull-ups on the multiaxial device, resistance exercises, and angular movements according to the nature of the work of the injured muscles and controlling the radius of the arm when performing the exercises. The purpose of these exercises is to try to return the range of motion to The normal range, and the duration of the training was four weeks, and I started using exercises without resistance, then using resistance (rubber ropes), then exercises using weights such as (iron dumbbells and a barbell). The researchers used the parallel device and the moving barbell, to develop the special muscles, as the movement was done in parallel. The arms are extended beside the body so that the movement is with the wrists of the hands, as well as resting on the parallel bar with the armpits and bending and extending the upper arm... etc.

Show results:

Table (1)
Analysis of variance between the three measurements (pre-, mid- and post-) regarding the research variables

| (g) | (f) F value | | (e) Mean squares | (d) | (c) Sum of squares | (b) Source of variance | (a) variable |
|---|---|---|---|---|---|---|---|
| | (i) | (h) Calculated | | | | | |
| Dal | 0,001 | 15,53 | 39.115 | 2 | 78.23 | (k) Between groups | (j) Degree of pain |
| | | | (o) 2,519 | (n) | (m) 37.789 | (l) Within groups | |
| | | | (s) 6.40 | (r) | (q) 95.616 | (p) Within groups | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Dal | 0,005 | 8.265 | 540.993 | 2 | 1081,987 | (u) Between groups | (t) Dimensions |
| | | | (y) 65.46 | (x) | (w) 981.839 | (v) Within groups | |
| Dal | 0,002 | 7.945 | 454,211 | 2 | 908,423 | (aa) Between groups | (z) Rounding |
| | | | (ee) 57.170 | (dd | (cc) 857.543 | (bb) Within groups | |
| Dal | 0,000 | 12.452 | 59.50 | 2 | 119.005 | (gg) Between groups | (ff) Maximum strength |
| | | | (kk) 4.96 | (jj) | (ii) 74.378 | (hh) Within groups | |

* Significant at d.g (2, 15) and the significance level ≤ (0.05)

Table (2)
The calculated L.S.D value and the significance of the differences between the three research tests (pre-medial-post)

| Meaning of differences | Calculated L.S.D value* | Arithmetic teams | Arithmetic circles | Totals | Variables |
|---|---|---|---|---|---|
| slab (middle) | 0.54 | 1.88* | 4.80 – 2.92 | Tribal-central | Degree of pain |
| slab (next) | | 2.88* | 4.80 – 1.92 | Pre-post | |
| slab (next) | | 1.00* | 2,92 – 1.92 | Medial - lateral | |
| slab (middle) | 9.82 | -35.00* | 104.06 – 139.06 | Tribal-central | Dimensions |
| slab (next) | | -58.13* | 104.06 – 162.19 | Pre-post | |
| slab (next) | | -23.13* | 139.06 – 162.19 | Medial - lateral | |
| slab (middle) | 6.01 | -19.37* | 30.88 – 50.25 | Tribal-central | Rounding |

| | | | | | |
|---|---|---|---|---|---|
| slab (next) | | -26.56* | 30.88 – 57.44 | Pre-post | |
| slab (next) | | -7.19* | 50.25 – 57.44 | Medial - lateral | |
| slab (middle) | 0.68 | -1.33* | 15.14 – 16.47 | Tribal-central | Maximum strength |
| slab (next) | | -3.64* | 15.14 – 18.78 | Pre-post | |
| slab (next) | | -2.31* | 16.47 – 18.78 | Medial - lateral | |

Discussion

From Table (1) it is clear that there are significant differences between the three tests (pre - mid - post) and for the research variables. The reason for the emergence of these differences is the effect of rehabilitation exercises according to force torques, which clearly affected muscle adaptation and rehabilitation, and this is what caused a decrease in the degree of pain, especially in Posttest: These exercises provided the opportunity to recover and qualify in a limited or limited period of time, as torque training requires the injured person to work with wide ranges of the joint and with high flexibility of the muscles, which is linked to overcoming the stage of pain and (with health) and performing work to its maximum rate, and the lack of flexibility of the joints and muscles limits of the individual's efficiency at work). (Jawad, M., & Jabbar Shinen, 2016) The differences also appeared significant in the (forward lift) test, the (backward pull) test, the (dimensional) test, and the (approximation) test if the significance level of the (F) values was less than the 0.05 error level. Significant differences also appeared in the (maximum strength) test. The researcher attributes the emergence of these results to the effectiveness of the exercises used in rehabilitating the working muscles and improving the working ranges of the shoulder joint for the research sample. The increase in maximum strength is also due to the diversity in the implementation of the qualifying exercises according to the force moment exercises. Using different tools, this is consistent with a study (Kesiktas et al., 2021) on the effectiveness of rehabilitative exercises in treating and rehabilitating the body's joints (shoulder and knee) by increasing the muscle strength of those joints after injury and also increasing their range of motion (Prof. Dr. Mohammed Jawad Kadhim, Prof. Dr. Ghadah Muayad Shihab, 2021), and in order to identify the significance of the differences between the results of the three tests, the researcher conducted the least significant difference test, and its results are presented in Table (2). The values of the least significant difference (L.S.D), respectively, indicate the significance of the differences in favor of the test. The post-test, then the middle test, then the pre-test, at a significance level less than (0.05).

The development that occurred in the results of the research variables, with a preference for the post-test, is due to the nature of the rehabilitation exercises, which had a positive effect on increasing the blood supply to the working muscles and improving the work of the working muscles and the strength output after rehabilitation, as it is known that many of the body's joints only allow the individual to A certain degree of flexibility and in proportion to their anatomical structure. These exercises for those injured in these games have given the opportunity for recovery and rehabilitation in a shorter period of time (Moayed, A., Moayed, G., & Jawad, 2019), as these exercises are characterized by the similarity of their paths to the paths of muscular action related to performance. Hitting and throwing in these games depends on the principle of gaining strength and gaining speed within the system of torques and levers, which depends on the principle of appropriate muscle elongation (kinetics), which contributed to The direct effect of developing this strength in the sample members and reducing the degree

of pain (Majid, S., & Jawad, 2023), and the use of gradual training loads had a clear effect in not repeating the development of the sample members, as it is an effective method (to prevent internal disorders in the joints). And muscle tendons, in other words, the dimensions of the state of rupture and muscle spasm) and (obtaining a sufficient degree of flexibility for the muscles, tendons, and ligaments of a particular joint or group of joints in a particular movement or activity depends on the amount and intensity of exercises that are performed in a wide range of motion, as well as on the degree of previous acquired flexibility. per capita (Weiss et al., 1970)

After presenting the results, a set of conclusions were reached, the most important of which are:

1. Exercises had a positive effect on the relief of pain for people with shoulder joint injuries in the research sample.
2. Moment exercises improved range of motion.
3. The improvement in the range of motion of the shoulder joint was associated with the disappearance of pain and led to a clear improvement in the range of motion.

In light of the conclusions, the researcher recommends the following:

1. Diversify the selection of strength exercises according to the torque and achieve the desired elongation and range of motion.
2. It is necessary to conduct research and studies on other injuries according to the specificity of each injury and prepare its rehabilitation exercises.
3. The necessity of regulating intensity, volume, and comfort when using rehabilitation exercises according to determination for those injured in various sports.

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