



THE EFFECT OF A REHABILITATIVE PROGRAM ON THE STRENGTH ENDURANCE OF THE SCAPULA MUSCLES INJURED BY THE TEAR OF ATHLETES

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Abstract

Physical and sporting activity is an urgent necessity of life to keep pace with the tremendous scientific progress in various areas of life in our time as a result of the introduction of modern technologies into most facilities of life and the availability of amenities, which has led to a lack of physical activity and thus a decline in the individual's resistance to diseases and injuries, as well as weak activity. Vital devices. Many countries of the world have paid attention to physical exercises in particular and sports activities in general, as great educational and health values, and one of the requirements of modern life is the human dependence on mechanization, so practicing sports has become a necessity that cannot be dispensed with, and one cannot even avoid thinking about it, and sports injuries are considered one of the obstacles. The danger facing players may often cause them to be excluded from practicing sports due to the difference in the nature of their bodies, their measurements, their physical composition, and the type of activity on the one hand. There are also many causes of injury, including equipment, tools, sports shoes, stadium floors, insufficient warm-up, and errors in training curricula, overload, and other factors. On the other hand, the individual must take care while performing the exercise to avoid health injuries as much as possible Physical exercise is necessary for every individual of both sexes and has a positive impact on the recreational, health and psychological aspects and is therefore a factor in progress, in addition to its effective contribution to delaying the onset of fatigue by improving the level of efficiency of the functional systems. Among the injuries related to high effort and poor physical fitness and body construction are joint injuries, including the shoulder blade muscles.

Introduction

The same applies to ordinary people and the pain that this injury may cause. The muscles of the shoulder blade have a wide range of motion in various directions, and this movement is closely linked to the integrity of the ligaments, muscles, and capsule present in the shoulder joint. Therefore, therapeutic exercises are one of the most important ways to remove Cases of muscle and joint dysfunction, as well as interest in understanding body movements and proper posture through performing exercises to develop muscle strength, joint flexibility, and the degree of nervous compatibility to restore normal condition.

Shoulder plate muscle injuries of various types occur frequently in athletic individuals as a result of work, stress, or accidents, as they result in degrees of partial tearing of the affected

muscle. Therefore, rehabilitation is an important aspect of treatment, and choosing the method that is not appropriate for the type and severity of the injury can affect the speed of recovery and then return to the playing fields as quickly as possible. As for the methods of treatment (rehabilitation), their means and methods differed, including therapeutic exercises and electrical activity developed by specialists and researchers, as they differed. The other is through its time, intensity, repetitions, and type of tests that measure the extent of the development of injury healing, according to the type of injuries sustained, and the general health status of the injured athletes in terms of pain relief, activity, delayed onset of fatigue, and range of motion. The duration also differed between (4-6-8) weeks in terms of pain relief and in terms of the patient's activity and the delayed appearance of fatigue while performing daily duties, whether at work or at home. Hence the importance of research in developing a proposed rehabilitation approach for some physical variables and electrical activity for injuries of partial rupture of the shoulder blade muscles using electrical stimulation and rehabilitative exercises, because these muscles are important in helping individual athletes in performing their sports duties, since the movement of the upper extremity depends primarily on safety. And the effectiveness of this muscle.

Research problem

The research problem lies in answering the following questions:

- Does the rehabilitation program have a role in rehabilitating a shoulder blade muscle injury?
- Does the prepared rehabilitation program have a role in influencing some physical variables, electrical activity, and range of motion of the shoulder blade?
- Is there a difference in the rehabilitation of the shoulder blade muscles between the rehabilitation program prepared by the researcher and the rehabilitation program prepared by the physical therapy unit at Al-Hussein Teaching Hospital in Dhi Qar Governorate?

Research objectives

1. Prepare a rehabilitation program and apply it to those with shoulder blade muscles.
2. Identify the effect of the rehabilitation program on force tolerance of the shoulder blade muscles.
3. Identify the preference in rehabilitating a shoulder blade muscle injury between rehabilitation using the rehabilitation program prepared by the researcher and the rehabilitation program prepared by the physical therapy unit in the hospital.

Research hypotheses

1. The prepared rehabilitation program has a positive effect on the force tolerance of the shoulder blade muscles.
2. There are differences in rehabilitation for shoulder blade muscle injury between rehabilitation using the rehabilitation program prepared by the researcher and the rehabilitation program prepared by the physical therapy unit in the hospital.

Research areas

First - the human field: athletes with shoulder blade muscles.

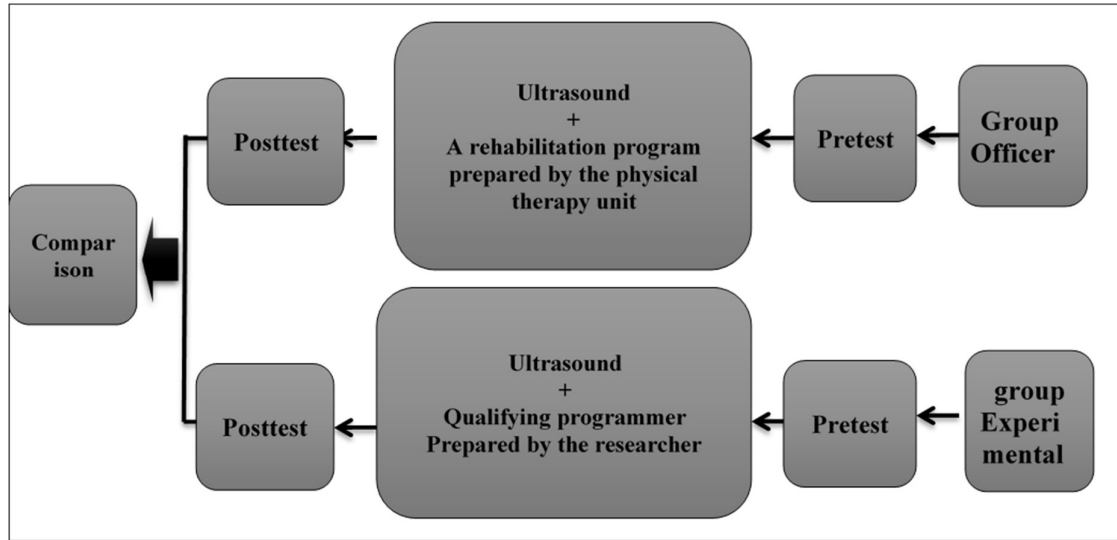
Second - Temporal scope: for the period from 11/13/2022 AD until 5/20/2023 AD.

Third: Spatial field: Dhi Qar

Research methodology and field procedures

Research methodology

“ The experimental method is the closest research method to solving problems by the scientific method. It is an attempt to control all the basic variables and factors with the exception of one or more variables, which the researcher changes with the aim of determining and measuring its scientific effect and because the nature of the research requires knowledge of a (specific) effect, so the researcher used the experimental method and designed (Two equal groups): control and experimental, and Figure (1) shows this



Research community

The researcher identified his research population, represented by athletes with shoulder blade muscles for sports clubs in Dhi Qar Governorate, who numbered (8) players distributed from (2) wrestling, (2) volleyball, and (4) handball. In a random manner, the The community was divided into two control groups and an experimental group with (4) players for each group. These injured players were obtained by distributing questionnaire forms to the governorate’s clubs, governmental and private physical therapy centers, and specialized clinics.

Research tools and devices used

What is meant is the means or method by which the researcher can solve the problem, whatever it may be, such as tools, data, samples, or devices, and therefore he used many of them in order to achieve this:

Methods of data collection

- Arab and foreign sources.
- Tests and measurement.
- Registration Form.

Tools and devices used in research

- EMG device to measure muscle activity.
- Magnetic resonance imaging device (A.R.M)
- LENOVO electronic calculator.
- Genometer to measure range of motion.
- Weights of different weights from (1 kg - 20 kg)

- Office stationery, pens.

Research procedures

Diagnosis of the injury

At the beginning of the injury, a magnetic resonance imaging machine (A.R.M) is used, as well as after recovery, because it is sufficient to detect the type of damage and the rate of recovery occurring in the injury to the muscles of the shoulder blade. One of the most prominent reasons for using MRI is because such an injury may lead to a tear. The area of origin is therefore taken (A,R,M), as it has an effective role in the accurate diagnosis process, and through clinical examination and MRI, the type of injury was determined, which is of the (moderate) type.

Test of raising the extended arm to the side and lowering it (30 seconds)

- Purpose of the test: to measure the force endurance of the deltoid muscle.
- Equipment and tools: a 50 cm high bench, an electronic stopwatch. Dumbbells weighing 1.5 kg.
- Performance specifications:

Sitting on a bench with the torso straight, with the affected arm hanging down next to the body and the fingers of the hand pointing towards the body, holding a dumbbell weighing 1.5 kg. Raising the arm to the side of the body, that is, when the upper arm becomes in a horizontal position and forms a 90 degree angle with the body at the shoulder joint and the arm returns to the bottom, fully extended. Repeat the performance as many times as possible.

Test conditions

- It is not allowed to stop during the test.
- The straightness of the torso is observed during the performance stages.
- Correct attempts are made only when the arm reaches a horizontal position and forms a 90 degree angle with the body at the shoulder joint.

Recording: The tester records the number of correct attempts he makes within 30 seconds.



Description of the test to measure the range of motion of the shoulder joint (basic movements)

- The aim of the test: to measure the range of motion of the shoulder joint in the basic (6) movements.
- Tools used: Goinometer to measure range of motion (ROM)

- Description of the test: The affected person performs the test by performing 6 different movements in order to measure the range of motion of the shoulder joint, as the angles for each movement range as follows:
 - Forward flexion: The movement is carried out on an axis and at a degree (0 - 180) on a transverse axis, the humerus moves forward and rotates to the medial side.
 - Extending backwards: Moving along a transverse axis at a degree (0 - 60), the humerus moves backwards and rotates to the lateral side.
 - Dimensions: The degree of flexibility is (0-180) and the dimensions are starting from placing the dangling limb next to the body (resting position). Movement is free and easy for a range of (180 degrees) from the torso.
 - Adduction: The degree of flexibility is (60-0) and adduction begins from placing the dangling limb next to the body (resting position). Movement is free and easy for a range of (60) from the torso towards the lateral side.
 - Inward rotation: The degree is (0-90) degrees if the arm is rotated inward.
 - External rotation: The degree is at a distance of (0-90) degrees from the body.
 - Recording: The degree of angles of the movements is recorded in the player's form as he performs these movements to the maximum range of motion that the joint can reach, stopping when he feels pain.

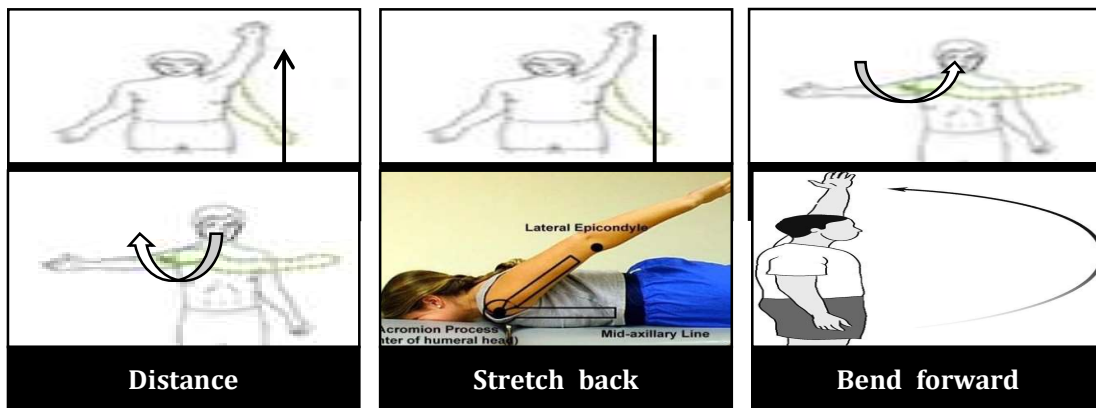


Figure (8) shows the six motor range movements

Exploratory experience

Scientific research experts recommend conducting exploratory experiments for the tests used in research in order to obtain the necessary reliable results and information, to benefit from them when conducting the main experiment, as well as in order to arrive at the best way to conduct the selected tests. The exploratory experiment is “revealing the mysterious or missing links in The sequence of human thinking, which helps in analysis, linking, and accurate scientific interpretation, avoiding negatives, and adding scientific knowledge to new pillars when implementing the main experiment in the research” Accordingly, the researcher conducted an exploratory study on (2) players with scapula muscles, as this experiment was applied in a hall Al-Anwar in Dhi Qar Governorate on Monday 12/19/2022 AD at three in the afternoon, as the players were tested with variables of strength endurance and range of motion.

Pretests

Pre-tests for the research sample were conducted in Al-Anwar Hall in Dhi Qar Governorate. They were conducted on different dates because the sample was not available in groups, but it came sequentially, one after the other, because the sample with shoulder blade muscles is not easy to obtain in one batch. However, the researcher confirmed all the circumstances. related to time and place for the purpose of benefiting from and applying them during the pre-test period, as well as to provide the same conditions in the post-tests, as the pre-tests were conducted in the strength tolerance and range of motion of the shoulder blade muscles.

Post-test

After completing 8 weeks for each patient, the researcher conducted the post-tests under the same conditions and capabilities as the pre-tests, that is, in a consistent manner as in the pre-tests. They were examined by the specialist doctor and a clinical examination was conducted. After that, the researcher conducted the post-tests. The researcher was keen as much as possible to provide the same conditions. In terms of place, time, tools, and the supporting team, as in the pre-test, the tests were carried out in Al-Anwar Hall in Dhi Qar Governorate at three o'clock in the afternoon, as post-tests were conducted in the force endurance and range of motion of the shoulder blade muscles.

Statistical methods

The researcher used the statistical program (SPSS v.27) for statistical processing, as well as the program.

Presenting, analyzing and discussing the results of the pre- and post-tests for the control group
 Displaying and analyzing the results of the pre- and post-tests for the physical variables of the control group

Table (1) Arithmetic means, standard deviations, t value, and significance of the differences between the pre- and post-tests of the physical variables for the control group

Statistical significance	Significance level	(value) Calculated	Posttest		Pretest		measuring unit	variable
			A	s	A	s		
moral	0.037	3.573	2.217	17.250	4.349	7.250	kg	Withstand strength

The results of the table above show that the significance level values of the (t) test for the correlated samples for the variable (strength endurance) were smaller than the error rate (0.05) at a degree of freedom (3). This means that there are differences between the pre- and post-tests and in favor of the post-test for the control group sample.

Presenting and analyzing the results of the pre- and post-tests on the range of motion movements of the control group

The arithmetic means, standard deviations, t value, and significance of the differences between the pre- and post-tests of the six movements of the motor range of the control group

Statistical significance	Significance level	(value) Calculated	Posttest		Pretest		measuring unit	Variables
			A	s	A	s		

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moral	0.005	7.653	4.19 3	168.7 5	14.36 1	98.750	degree	Forward bend
moral	0.007	6.685	2.38 0	52.50 0	3.775	32.750	degree	The tide is for slippers
moral	0.008	6.355	4.50 9	169.5 0	17.32 8	100.25 0	degree	Dimensions
moral	0.035	3.690	1.91 5	39.50 0	6.292	26.250	degree	Rounding
moral	0.016	4.963	3.09 6	79.25 0	6.449	55.750	degree	Outward rotation
moral	0.022	4.376	3.58 1	79.20 0	7.024	56.050	degree	Inward rotation

The results of the table above show that the significance level values of the (t) test for the correlated samples for the six movements of the range of motion of the shoulder muscles (forward flexion, backward extension, abduction, adduction, external rotation, backward rotation), were smaller than the error rate (0.05) at degrees of freedom (3) This means that there are differences between the pre- and post-tests, in favor of the post-test for the control group sample.

Presenting, analyzing and discussing the results of the pre- and post-tests for the experimental group

Presenting and analyzing the results of the pre- and post-tests for the experimental group's physical variables

Table (3)Arithmetic means, standard deviations, t value, and significance of the differences between the pre- and post-tests for the physical variables of the experimental group

Statistical significance	significance level	(value) Calculated	Posttest		Pretest		measruin g unit	variable
			A	s	A	s		
moral	0.002	10.349	1.29 1	20.50 0	3.77 5	6.25 0	kg	Withstand strength

The results of the table above show that the significance level values of the (t) test for the correlated samples for the variable (strength endurance) were smaller than the error rate (0.05) at a degree of freedom (3). This means that there are differences between the pre- and post-tests and in favor of the post-test for the experimental group sample.

Presenting and analyzing the results of the pre- and post-tests on the range of motor movements of the experimental group

Table (4) The arithmetic means, standard deviations, t value, and significance of the differences between the pre- and post-tests of the six movements of the motor range of the experimental

group

Statistic al signific ance	Signif icance level	(valuet) Calculat ed	Posttest		Pretest		measru ing unit	Variables
			A	s	A	s		
moral	0.002	10.009	2.217	176.75	13.672	100.250	degre e	Forward bend
moral	0.003	9.394	1.708	57.250	3.531	33.025	degre e	The tide is for slippers
moral	0.004	8.052	1.422	177.325	18.046	102.500	degre e	Dimensions
moral	0.015	5.093	1.291	43.500	5.909	27.750	degre e	Rounding
moral	0.009	6.050	2.872	86.750	7.411	56.250	degre e	Outward rotation
moral	0.011	5.683	2.754	87.250	8.284	56.700	degre e	Inward rotation

The results of the table above show that the significance level values of the (t) test for the correlated samples for the six movements of the range of motion of the shoulder muscles (forward flexion, backward extension, abduction, adduction, external rotation, backward rotation), were smaller than the error rate (0.05) at degrees of freedom (3) This means that there are differences between the pre- and post-tests and in favor of the post-test for the experimental group sample.

Presentation and analysis of the results of the control and experimental groups for physical variables in the post-tests

Arithmetic means, standard deviations, t value, and significance of differences between the control and experimental groups for physical variables in the post-test

Statistic al signific ance	Signif icance level	(valuet) Calculat ed	Posttest		Pretest		measru ing unit	variable
			A	s	A	s		
moral	0.044	2.533	1.291	20.500	2.217	17.250	kg	Withstand strength

The results of the table above show that the significance level values of the (t) test for the independent samples of the variable (strength endurance) were smaller than the error rate (0.05) at a degree of freedom (6). This means that there are differences between the control and experimental groups in the post-test and in favor of the experimental group .

Presenting and analyzing the results of the control and experimental groups for range of motion movements in the post-tests

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The arithmetic means, standard deviations, t value, and significance of the differences between the control and experimental groups for the six movements of the motor range in the post-test.

Statistic al signific ance	Signif icance level	(value) Calculat ed	Posttest		Pretest		measr uing unit	Variables
			A	s	A	s		
moral	0.015	3.373	2.217	176.75	4.193	168.75	degre e	Forward bend
moral	0.018	3.243	1.708	57.250	2.380	52.500	degre e	The tide is for slippers
moral	0.016	3.310	1.422	177.325	4.509	169.50	degre e	Dimensions
moral	0.013	3.464	1.291	43.500	1.915	39.500	degre e	Rounding
moral	0.012	3.552	2.872	86.750	3.096	79.250	degre e	Outward rotation
moral	0.012	3.564	2.754	87.250	3.581	79.200	degre e	Inward rotation

The results of the table above show that the significance level values of the (t) test for the correlated samples for the six movements of the range of motion of the shoulder muscles (forward flexion, backward extension, abduction, adduction, external rotation, backward rotation) were smaller than the error rate (0.05) at degrees of freedom (6). This means that there are differences between the control and experimental groups in the post-test and in favor of the experimental group.

Conclusions and recommendations

Conclusions

1. The range of motion and strength of the shoulder joint developed well for the first group that used therapeutic exercises and the physical therapy device.
2. There were significant differences in favor of the group that used therapeutic exercises and physical therapy devices in developing the range of motion and strength of the shoulder joint compared to the group that used therapeutic exercises only.
3. The significant differences that were in favor of the post-test in range of motion and strength indicate that the focus of physical therapy equipment and exercises in the proposed rehabilitation approach has a significant impact on the affected area as well as the muscles working on the shoulder joint.
4. Attention, follow-up, and focus on the work of physical therapy devices through the number and time of sessions has a significant impact in the first stage of treatment.

Recommendations

1. The necessity of using physical therapy devices at the beginning of the injury to get rid of pain, tumor, and damaged cells, and then practicing therapeutic exercises.

2. Continue to perform exercises from time to time, especially the affected area and the muscles surrounding it, after completing treatment with the devices. .
3. The necessity of treating the injury the moment it occurs. This leads to accelerating the healing process by using physical therapy devices according to the type of injury, as well as developing appropriate and scientifically well-studied therapeutic exercises based on the intensity and extent of their impact on the affected area.
4. The necessity of opening centers for sports medicine and physical therapy in all governorates and paying attention to the cadres working in those centers through external development courses.
5. The need to hold intensive seminars in the field of sports medicine, with the need to include athletes in these seminars to educate them about how to avoid risks.

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