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The effect of rehabilitative physical exercises to develop some aspects of muscle strength and range of motion in rehabilitating the deltoid muscle of the shoulder joint of badminton players

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Abstract

The importance of the research came in preparing rehabilitative exercises for the deltoid muscle in the shoulder joint using exercises with different resistances and angles. The researchers believe that the problem is that the rehabilitation programs that suffer from a lack of reliance on various exercises, devices and weights, as well as angles to determine the degree of pain, which is one of the most important factors in the speed of the process Rehabilitation and symmetry of recovery Therefore, the researcher decided to prepare rehabilitative exercises for the deltoid muscle injury using some different resistance, weights and angles, and try to benefit from them to rehabilitate these injuries to return the injured to practicing sports activity in the shortest possible period. The research aims to:

1. Preparing rehabilitative exercises for the deltoid muscle injury using some different resistances, weights and angles for the subjects of the research sample.
2. Identifying the effect of rehabilitative exercises for the deltoid muscle injury by using some different resistances, weights and angles among the members of the research sample.

The experimental method was used with one group and the number of injured (4) badminton was advanced in Wasit governorate for the 2018-2019 season, and the researchers concluded that the proposed rehabilitative exercises have a positive effect by restoring the normal range of motion on the muscle groups working on a joint, and it is recommended that the means should be used. Therapeutic and auxiliary means to rehabilitate muscle injury in carrying out rehabilitative exercises in line with the level of injury.

Keywords: Rehabilitative physical exercise, deltoid muscle, shoulder joint and badminton.

Introduction

The ability of this joint to move is very large as it moves in all directions, but it lacks some strength and consists of the humerus joint with the muscular fossa of the scapula. The shoulder blade injury is one of the common injuries in badminton, where many occur either as a result of a strong movement such as sending or when pressing over the

Research Objectives

1. Preparation of a proposed rehabilitation approach to rehabilitate the deltoid muscle injury in badminton players.
2. To recognize the effectiveness of rehabilitative exercises in rehabilitating the deltoid muscle injury of badminton players.

Hypothesis

- Rehabilitation exercises have a positive effect in rehabilitating the partial rupture of the deltoid muscle in badminton players.

Fields of Research

- The human field: a sample of advanced badminton players in Wasit governorate clubs.
- Timing range: 5/1/2019 to 15/7/2019.
- Spatial domain: badminton playgrounds in Wasit Governorate.

Research methodology

The researcher used the experimental method for its relevance to the nature of the research.

The research community and its sample

The researcher selected the research sample in an intentional way to include a number of players injured in the semantic muscle of the shoulder joint, and their number reached (4) injured players playing badminton for Wasit Governorate for the 2018 season and they were homogeneous in the research variables as in Table (1) .

head, especially when the player neglects the appropriate warm-up procedure to prepare the joint muscles well, which leads to the rupture of the joint fibers and the occurrence of internal bleeding that results in the passage of time Calcium calcification, which requires removal by surgery, so attention must be paid to warm-up exercises, especially strength and flexibility exercises, in addition to performing some real movements of sending or pressing during the warm-up period without a ball first and then using the ball in order to increase the readiness of the joint muscles and prepare them for the performance of physical effort, and the importance of the research came In using rehabilitative exercises to injure the deltoid muscle in badminton players for the purpose of subjecting them to this type of rehabilitation and in order to achieve complete recovery.[1]

The researcher believes that the problem is that the rehabilitation programs that suffer from a lack of reliance on various exercises, devices and weights, as well as angles to determine the degree of pain, which are considered one of the most important factors in the speed of the rehabilitation process and the symmetry of recovery. And try to benefit from them to rehabilitate these injuries, to return the injured to practicing sports activity in the shortest possible period.[2]

Table 1. shows the homogeneity between individuals of the research sample in the morphological measurements and the study variables

Variables	measuring unit	mean	standard deviation	Mediator	Coefficient of torsion
Length	cm	181.75	5.377	182.50	-0.574
Weight	kg	65.25	1.708	65.50	-0.753
Biological age	Year	21.50	5.802	21	0.491
Tide forward shoulder	Degree	17	1.826	17	0.000
Shoulder movement	Degree	35	3.559	34	0.842
Explosive force	mater	4.754	0.45	4.902	-0.986
Fast power	Number	6.416	0.523	6.250	0.952

Shoulder Extension Forward

- The laboratory sits facing the device, with its arm at an angle (90) between the upper arm and the forearm.
- The arm is placed on the device and on the far side of the arm.
- The lab pushes its arm forward.
- The arm fixed on the device is parallel to the torso.
- The moving arm on the device is parallel to the hummers.
- Read and record the degree achieved from the extent of the arm's reach to the highest point of the degree of pain and the measurement with the tape attached to the device.
- The ideal range of motion for shoulder flexion motion is (0-60) degrees.

Extended Shoulder Movement

- The laboratory sits facing the device, with its arm at an angle (90) between the upper arm and the forearm.

The results of Table (1) show that the values of the torsion coefficients for the variables contained in it were specified between (± 1), and that they are within the (kaus) curve of the normal distribution, which means the homogeneity of the search sample.

Methods of gathering information

- Arab and foreign references and sources.
- Standardized tests for some physical characteristics and the normal range of motion of the shoulder joint.
- Stopwatch .
- Height and weight measuring device.
- The geometer.
- Tape measure.
- Medicine balls of (3 - 5) Kg.
- Various sports iron weights and equipment.

Tests of the normal range of motion of the shoulder joint [3]

The dynamic range of the shoulder joint was measured.

forward during the throwing of the ball with the hands, so that the process of throwing the ball with two hands without using the trunk Each laboratory is given three attempts to score the best.

- Scoring: The distance between the front edge of the chair and the closest point the ball makes on the floor is calculated.

From the front support position, bend the arms and extend them in (10) seconds[5]

- The purpose of the test: to measure the velocity characteristic of the muscles in the arms.
- Tools used: a verifier to evaluate and calculate the correct attempt, stopwatch.
- Performance description: From the front stand position, the tester bends the elbows until it touches the ground with the chest, then returns again to the stand. The performance is repeated as many times as possible within (10) seconds according to the specified conditions.
- It is not allowed to stop during the test.
- The body must be straight during the performance.
- The necessity to bend the elbows completely and extend them to their maximum extent
- Any violation of the conditions, the attempt will be canceled
- The arm is placed on the device and on the far side of the arm.
- The laboratory is removing his arm out of the body.
- The arm fixed on the device is parallel to the torso.
- The moving arm on the device is parallel to the hummers.
- Read and record the degree achieved from the extent of the arm's reach to the highest point of the degree of pain and the measurement with the tape attached to the device.
- The ideal range of motion for off-shoulder extension motion is (0-60) degrees.

Muscle strength tests

Test of throwing a 3 kg medicine ball with two hands from a sitting position on a chair [4]

- The purpose of the test: to measure the explosive power of the muscles of the arms and shoulder.
- The tools used: a medicine ball weighing (3) kg, a measuring tape, and a chair with a strap for fixing the trunk.
- Description of the test method: The laboratory sits on the chair and the medical ball is carried by hands over the head and the torso is adjacent to the edge of the chair, the belt is placed around the trunk of the laboratory and held from the back in a controlled manner for the purpose of preventing the laboratory from moving

sequence of rehabilitative exercises placed therein.

4. Conducting a rehabilitation unit to know the time and recurrence.

Pre-tests

The researcher conducted the pre-tests procedures (before the rehabilitative curriculum) after taking the magnetic resonance rays and then determining the severity of the injury by reading the resonance by a specialist doctor. The pre-tests were done on Thursday 9/5/2019 at exactly five o'clock in the afternoon in Wasit Stadium on the search group after That the test is shown to the research sample in order to obtain all the variables through performance.

The proposed rehabilitation curriculum (the main experiment)

The researcher prepared the rehabilitative exercises using the proposed device and using multiple means and added weights (weights) for a period of two months and at three rehabilitative units per week, then he presented them to the experts to see the suitability of the exercises that he applied to the injured:

- The prepared rehabilitation curriculum includes performing exercises to rehabilitate shoulder joint injuries. The purpose of these exercises is to rehabilitate the deltoid muscle of the shoulder joint as well as increase the range of motion and try to return the range of motion to the normal range and in all directions of movement.
- Recording: Counts the number of times the correct performance is repeated within (10) seconds.

Pilot study

In order to identify the positive and negative aspects that may appear in the future and for the purpose of avoiding them and developing, deleting or modifying some research steps and to ensure the suitability of the proposed period of time for the rehabilitative unit and for the purpose of ensuring the safety of the work of devices and tools and identifying the validity of the measurements and tests used in the research and the ability of the researcher and the work team On its performance and implementation, the researcher conducted a preliminary exploratory experiment on a sample of (2) individuals from infected patients on Saturday (4/5/2019). When conducting the pilot experiment, the same conditions and conditions as the main experiment must be met as much as possible so that Taking its results .[6]

An exploratory experiment was conducted as follows:

1. An exploratory experience to see the success of the tests in the curriculum, validity, equipment and tools, their safety, and the assistant staff.
2. Knowing the difficulties and obstacles that the researcher may face while applying the exercises.
3. Making some adjustments to the vocabulary of the rehabilitation curriculum in terms of repetition and

that would rehabilitate the working muscles on the shoulder joint in general and the deltoid muscle in particular, and it depends on the strength and flexibility of the muscles working on it. The exercises to increase the range of motion and rehabilitate the working muscle that are very necessary in sports such as tennis, badminton, handball and swimming,[7] the researcher took care of the diversification and change in the rehabilitative exercises used in terms of the type of exercises and their basic conditions.

The content of the rehabilitative exercise was

1. The exercises included work on pain control, rehabilitation of injured tissues, and focus on correcting joint function and returning to normal position.
2. The difficulty of rehabilitative exercises was adopted from (50%) to the arrival of the injured similar to severe recovery (80%) for strength and range of motion exercises, and the number of repetitions and groups depending on the source[8].
3. The time period for implementing the rehabilitative exercises amounted to (8) consecutive weeks.
4. The number of rehabilitative units per week reached (3) sessions on (Saturday, Monday,

- The researcher took into account the principle of a gradual increase in the resistance position, from easy to difficult, by using passive exercises at the beginning of the curriculum (the first week), then gradually increasing the difficulty of exercises in the following weeks, using self-resistance exercises (weight and body parts) with the development of external resistances.
- The rehabilitative unit included physical exercises and the exercises were using body weight and weights, and the focus was on the use of resistance and then exercises using medical balls in order to give the body an opportunity and sufficient time to recover from the injury before the injured muscle returns to its normal state before the injury as much as possible and to engage in any physical activity that requires effort. Physical level of intensity, in addition to performing various movements in different directions that would give the injured shoulder joint the ability to restore the normal range of motion that was determined by the injury, especially when the members of the sample are among the players who suffer from a specific injury, as for physical exercises The researcher was keen on preparing a method

and devices in order to fix the variables as much as possible.

Statistical methods

The researchers used the social statistical bag (SPSS) to calculate each of the values of:

- mean .
- Mediator .
- Standard deviation .
- Coefficient of torsion.
- t-test for cross-linked samples.

Results and discussions

Presentation and analysis of the results of the pre and post test for the range of motion and physical tests of the deltoid muscle of the shoulder joint for the research group

and Wednesday) days of the week.

5. The total number of college rehabilitative units (sessions) is (24) rehabilitative units.
6. The rehabilitation unit time (30) minutes.

Post test

After the end of the qualifying curriculum, the post-test was conducted on the research sample on Thursday 4/7/2019 at 5 p.m., taking into account the same pre-test conditions on a laboratory, as the researcher was keen to create the same conditions for testing in terms of time and place and the assistant work team Same (in the pre and post tests), tools

Table 2.Shows the means, standard deviations, and the calculated value (t) and the significance of the kinematic and physical range test for the pre and post tests.

Variables	Measuring unit	Pretest		Posttest		p	P e	(t) Calculated	Moral value	Indication
		mean	St.d	mean	St.d					
Tide forward shoulder	Cm	17	1.826	22.75	1.708	5.75	1.258	9.139	0.003	moral
Shoulder movement	Cm	35	3.559	39.75	3.304	4.75	1.708	5.563	0.011	moral
Explosive force	Mater	4.613	0.395	5.261	0.263	0.64	1.649	3.724	0.014	moral
Fast power	Number	6.416	0.523	7.816	0.447	1.4	1.716	3.355	0.035	moral

Significance when (Sig)> (0.05), degree of freedom (n - 1) = 4 - 1 = 3, significance level (0.05)

of the shoulder joint, which indicates that the differences are in the post test, meaning that there is an effect of the experimental variable, and to know the truth of this Change and its statistical significance The researcher used the (t) test for the correlated samples, as we find that the mean of the tide variable

Table (2) shows us the values of the mean and the standard deviation and the extent of their difference before and after the implementation of the rehabilitative curriculum for the tests of the normal range of motion and the muscle strength of the deltoid muscle

characterized by velocity) in the pre-test was the value (416.6) and a standard deviation of (523,0), while we find that the mean in the post test of the variable itself was the value (816,7) and a standard deviation Its value is (047,0) and when calculating the value of (t), we find it with a value of (355,3), and since the statistical significance is (013,0) and it is less than the level of significance (05,0), this indicates the presence of significant differences between the pre and post tests For the benefit of the post test.

By looking at the results of Table (2), the two researchers note that there are differences in the mean between the two pre and post tests in the variables of the kinematic range (extension backward, forward bending, transmission) for the research group and in favor of the post test compared to the pre-test, [9]"That the increased range of motion means an improvement in the elasticity of the muscles and ligaments surrounding the joint as well as an improvement in the work of the neuromuscular in controlling the work of the sensors responsible for providing the sensory information to the brain about this range."[10] From here as if the proposed device and the application of applied exercises prepared have a positive effect in improving The kinematic ranges of the corners of the shoulder joint and its reflection on their athletic level, their return to the fastest period of time, and their activity again, "It is necessary to obtain a situation in which the main parts of the body are balanced

forward in the pre-test reached (17) with a standard deviation (1.826), while the mean in the post test reached (22.75) and with a standard deviation (1.708). The calculated value of (t) reached (9.139), which is greater than its tabular value of (3.182) under the level of significance (0.05) and at the degree of freedom (3), which indicates the existence of a significant difference between the pre and post tests and in favor of the post test.

Table (2) shows us that the mean of the outward tide variable in the pre-test reached (35) with a standard deviation (3.559), while the mean in the post test reached (39.75) and with a standard deviation (3.304), and the calculated value of (t) reached (5.563) and it is greater than its tabular value of (3.182) below the level of significance (0.05) and at the degree of freedom (3), which indicates the existence of a significant difference between the pre and post tests and in favor of the post test.

While we find that the mean of the variable (explosive power) in the pretest was a value of (613.4) and a standard deviation of (395.0), while we find that the mean in the post test of the variable itself was a value (261.5) and a standard deviation of (263.0), and when calculating the value of (t), we find it with a value of (724.3) and since the statistical significance is (014.0) and it is less than the level of significance (05,0), this indicates the presence of significant differences between the pre and post tests and in favor of the test Post. Whereas we find that the mean of the variable (force

addition to gradual physical pregnancy and exercises using weights gradient in the last weeks of the curriculum, which had a clear effect on the development and increase of strength. Future progress will be linked first of all, not to an increase in training reluctance. It will relate to the most effective selection of training methods and how to focus on synthesizing training doses that achieve the best results, and this in itself will require accurate knowledge of the vital effects of the exercises used in training ".[14]

Conclusions

1. Rehabilitation exercises have an effect by restoring the normal range of motion and flexibility of the deltoid muscle of the shoulder joint among the subjects of the research sample.
2. The development in the motor ranges of the shoulder joint is related to the disappearance of pain. Therefore, the positive effect of the rehabilitative approach in reducing or eliminating pain resulted in a clear improvement in the range of motion.

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and regular above the fulcrum and the organizational relationship between these parts Sound so that it can carry out its functions efficiently and with less effort ".[11]

By reviewing the results, the researcher found that the improvement between the pre-test and the post test led to a remarkable improvement in the forward bending test, which the researcher attributes to that the rehabilitative exercises that contain different types of methods of developing the range of motion before exercises of fixed and moving flexibility and the work of these exercises slowly and broadly Mobility helped in obtaining these results as (obtaining sufficient flexibility for the muscles, tendons, and ligaments of a particular joint or a group of joints in a particular movement or activity depends on the amount and intensity of the exercises that perform in a wide range of movement as well as on the degree of flexibility acquired prior to the individual) .[12]By reviewing the results, the researcher found that the significant change in the range of motion and passing most of the variables to the minimum range of the ideal range of motion to the effectiveness of the rehabilitative exercises on the proposed device in rehabilitating the affected area of the deltoid muscle because the exercises increase the body's flexibility and activity and increase the neuromuscular compatibility .[13]

We also note that the development of force resulted from the use of auxiliary means, where the researcher used, in

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