

THE EFFECT OF SPECIAL EXERCISES TO REHABILITATE THE DELTOID MUSCLE INJURY ACCORDING TO DIFFERENT ANGLES IN IMPROVING THE RANGE OF MOTION AND THE ACCURACY OF TRANSMISSION IN TENNIS FOR YOUNG PEOPLE

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Abstract

The importance of the research in the use of special exercises to qualify a injury in some deltoid muscles for tennis players contributed to their full recovery and the researchers see that the research problem is the lack of clarity in the qualifying approaches designed to treat players in this injury from the therapeutic point of view because these therapeutic exercises are of great importance for coaches and players. Whether as the occurrence of any injury to the shoulder joint will inevitably lead to injuries in the soft tissues of the joint and consequently will affect its movement and may lead to a decrease in movement, the researchers considered going into this study and preparing exercises and applying them in order to qualify the injured player with a picture Ment so as to ensure complete his recovery, which accelerates the return to training and competition depending on the exact diagnosis of the injury. The aim of the research is to:

- Preparing special exercises to rehabilitate the deltoid muscle injury according to different angles in improving the range of motion and the accuracy of serving in tennis for young.
- Recognizing the effectiveness of special exercises to rehabilitate the deltoid muscle injury according to different angles in improving the range of motion and the accuracy of transmission in tennis for young.

Since the nature of the problem determines the approach the researcher chooses to arrive at the results, he chooses the experimental approach in a one-group design method to suit its nature of the research. The research community included (6) injured players, while the research sample was selected intentionally and among patients with shoulder pain (deltoid muscle) after the diagnosis of the specialist doctor. The sample size was (4) players from Baghdad Clubs for the sports season 2020-2021.

The researchers concluded that special exercises have an effect by restoring the normal motor range and elasticity of the deltoid muscle of the shoulder joint in the individuals of the study sample. It is recommended to pay attention to the principle of diversification of exercises and the type of tools used when qualifying to avoid boredom in the injured.

Key words: Sports Psychology. Sport Exercise. Rehabilitation. Motor range. Tennis

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Introduction and importance of research

The field of sports activity is free from the possibility of injuries, and even the inevitability of their occurrence of all kinds and severity, which often include injury to joints, tendons and muscles, and sometimes injuries may occur in broken bones. Among the injuries that are related to high effort, poor physical fitness and physical construction are joint injuries, including (shoulder joint). Shoulder injuries of all kinds occur frequently in athletes as a result of work or repeated stress on the muscle. As for the treatment methods (rehabilitation), their means and methods varied, including the therapeutic exercises developed by specialists and researchers, which also differed in terms of time, intensity, frequency, and the quality of tests that measure the extent of the development of injury recovery, according to the type of injuries that occurred, and the general health status of the injured individual in terms of pain relief, activity and delay. The emergence of fatigue and range of motion, as the repetitive injuries of the deltoid muscles in the shoulder are the most common injuries that tennis players suffer from, for their use of the upper extremities from friction or rapid movements, and for the purpose of contributing to the rehabilitation and return of the injured to the stadium in a record period, it was necessary to devise means, devices or exercises. It is for the purpose of assisting workers in the field of rehabilitation and benefiting from it, and the importance of the research lies in the use of special exercises to rehabilitate an injury in some deltoid muscles of tennis players as a contribution to their full recovery.

Research problem

As a result of the lack of clarity in the rehabilitation curricula prepared to treat players in this injury from a therapeutic point of view, these therapeutic exercises are of great importance for coaches and players alike, as any injury to the shoulder joint will inevitably lead to injuries in the soft tissues of the joint and thus will affect its movement and may lead to a drop in movement. The researchers decided to go into this study and prepare and apply exercises in order to rehabilitate the injured player in a safe manner so as to ensure his full recovery and which speeds up his return to training and competition depending on the accurate diagnosis of the injury.

Research objectives

- Preparing special exercises to rehabilitate the deltoid muscle injury

according to different angles in improving the range of motion and the accuracy of serving in tennis for young people

- Recognizing the effectiveness of special exercises to rehabilitate the deltoid muscle injury according to different angles in improving the range of motion and the accuracy of transmission in tennis for young people.

Research assignments

There are statistically significant differences between the pre and post test of motor range and transmission accuracy in tennis for young people.

Research field

- The human field: a sample of advanced tennis players in Baghdad governorate clubs.
- Time range: 23/8/2022 to 19/11/2022.
- Spatial domain: Tennis courts at Al Shaab International Stadium.

Research Methodology and Field Procedures

Research methodology

Since the nature of the problem is what determines the method chosen by the researcher to reach the results, the experimental method was chosen in the style of a single group design to suit the nature of the research.

Research community and sample

The researcher's choice of the sample is one of the important steps and stages of the research. There is no doubt that the researcher determines the research sample from the beginning of defining the research problem, its objectives, research hypotheses, hypotheses and plan controls the steps and selection of its tools such as the sample, questionnaires and necessary tests. (Obeidat and Abdel Rahman, 1988, 109), and it included a community. The research was conducted on (6) injured players, while the research sample was chosen by the intentional method and from patients with shoulder pain (deltoid muscle) after the diagnosis of the specialist doctor (Table 1).

The results of Table 1 show that the values of the skewness coefficients for the

Table 1: Shows the homogeneity of the research sample in the research variables (tidal forward, approximation, dimensions, transmission) of the research sample.

Variables	Meas unit	Arithmetic mean	standard deviation	Mediator	skew modulus
Height	cm	181.75	5.377	182.5	-0.574
Weight	kg	65.25	1.708	65.5	-0.753
Age	year	21.5	5.802	21	0.491
Tide forward shoulder	cm	17	1.826	17	0
Shoulder abduction movement	cm	35	3.559	34	0.842
Send	Degree	12	1.826	12	0

variables contained in it were determined between (± 1), and they are within the (Kaoss) curve of the normal distribution, which means the homogeneity of the research sample in it.

Research tools and devices used

Research tools: It is the means by which the researcher can solve a problem, whatever those tools, data, samples, devices: (Wajeeh Mahjoub, 1993, 279).

Means of collecting information

- Arab and foreign sources.
- Direct personal interviews with specialists.
- A form to unload the data.
- The International Information Network (Internet).

Means, devices and tools used in the research:

- Electrical stimulation device (Tens).
- Thermal kit for heating and cooling kit for hospitalization.
- Medical tape to fix the electrodes of the electrostimulation device.
- Rubber ropes.
- A ruler for measuring range of motion.
- A legal tennis court.
- Racket and 10 tennis balls.
- Medical balls of different weights.

Tests of the normal range of motion of the shoulder joint

The range of motion of the shoulder joint was performed

Forward tidal movement of the shoulder

The laboratory sits facing the device and its arm is at an angle of (90) between the upper arm and forearm.

The arm is placed on the device and on the lateral side of the arm.

- The lab pushes his arm forward.

The arm fixed on the device is parallel to the torso.

The movable arm on the device is parallel to the humerus.

- Read and record the degree achieved by the arm's reach to the highest point of the degree of pain and measured through the tape installed on the device.

The ideal range of motion for shoulder flexion is (0-60) degrees.

Abduction movement out of the shoulder

The laboratory sits facing the device and its arm is at an angle of (90) between the upper arm and forearm.

The arm is placed on the device and on the lateral side of the arm.

The laboratory removes his arm from outside the body.

The arm fixed on the device is parallel to the torso.

The movable arm on the device is parallel to the humerus.

- Read and record the degree achieved by the arm's reach to the highest point of the degree of pain and measured through the tape installed on the device.

The ideal range of motion for the abduction movement outside the shoulder is (0-60) degrees.

Transmission Evaluation Test (Ali Makki, 2007, 89)

Actions:

- The player must hit (8) services, two services to the wide area of the first service box and two services to the center area for the first service as well, two services to the center area for the second service and two services to the wide area of the second service.
- Points shall be calculated based on the first ball falling.
- If the ball falls anywhere within the correct serving area, the player is not given a second attempt to serve because the first serve is correct, and if the ball touches the net (Let), the transmission is repeated.

Calculation of Transmission Accuracy

First transmission

1. Two points when the ball lands in the correct service area (the center area).
2. Four points when the ball lands in the area to which the first service is intended (in the side wide area of the service area).

Second transmission

1. 1 point when the ball lands in the correct serving area (the middle).
2. Two points when the ball lands in the target service area (the side area of the service area).
3. The points and the highest possible result for the first and second service are totaled and equal to (18) points.

Experimental experiment

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 time period for the qualifying unit and for the purpose of ensuring the safety of the work of devices and tools and to identify 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) infected patients on Monday (15/7/2019). take its results. (Abdul Rahman Essawy, 1974, 58)

Two exploratory experiments were conducted as follows:

1. An exploratory experience to know the success of the tests in the curriculum and the validity of the devices, tools and assistant staff.
2. Knowing the difficulties and obstacles that the researcher may face while applying the exercises.
3. Knowing the suitability of the device for the application of rehabilitative exercises.

The results of the pilot experiment resulted in

1. The safety and validity of the used tools and devices to which the research sample will be subject.
2. Make some modifications to the vocabulary of the qualifying curriculum in terms of repetition and the sequence of qualifying exercises placed therein.
3. Conducting a qualifying unit to know the time and frequency.

Tribal tests

The researcher performed the tribal tests (before the qualifying curriculum) after taking the magnetic resonance imaging and then determining the severity of the injury by reading the resonance by a specialist doctor. After the test is clarified to the research sample in order to obtain all the variables through performance.

The main experience (Qualifying Curriculum):

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

The prepared curriculum includes performing exercises to rehabilitate shoulder joint injuries. The purpose of these exercises was to rehabilitate the deltoid muscle of the shoulder joint, as well as increasing the range of motion and trying to return its range of motion to the normal range and in all directions of movement.

1. The researcher took into account the principle of gradual increase in the resistance situation, from easy to difficult, by using passive exercises at the beginning of the curriculum (the first week) and then gradually increasing the difficulty of the exercises in the subsequent weeks using self-resistance exercises (weight and body parts) with the development of external resistances.
2. The researcher used the exercise with heat (the thermal kit) for the purpose of heating and preparing the muscle to perform the exercises, and the use of the thermal kit was instead of physical exercises to warm up to avoid aggravation of the injury and increase the pain. The degree of swelling by improving blood flow in the blood vessels and the speed of building soft tissue by regenerating cells and improving the range of motion of the joints by increasing the sensitivity of the routine materials found in the connective tissues and bones, which reduces the degree of contraction and contraction of the accompanying bone and reduce the intensity of pain by reducing the degree of swelling Excitation of sensory receptors in the skin. (Wael Muhammad Omar, 2017, 221).
3. The researcher used a device (Tens) for electrical stimulation of the muscle for the purpose of reducing the pain sensors that the muscle sends to the central nervous system. The work of this device leads to an increase in the frequency and the patient does not feel pain, and it is used from the first week and excluded at the end of the third week in order to adapt the muscle to perform Exercising without feeling pain.
4. The researcher used the exercise by cooling (cold kettle) for the purpose of muscle recovery as a result of exerting effort in performing the exercises on the device, and the use of the cold kettle was to heal the affected part instead of full recovery of the body, and cooling works to reduce the degree of swelling, bleeding and inflammation due to contraction Blood vessels that reduce the speed of cell metabolism and disrupt the inflammatory reaction and stop pain as a result of the effect of cold on sensory receptors and nerve endings in the area of injury, which reduces the property of expansion of connective tissue and increases muscle viscosity. (Wael Muhammad Omar, 2017, 222).
5. The exercises were to increase the range of motion and rehabilitate the working muscle, which are very necessary in sports such as tennis, badminton, handball and swimming. (Al-Fadli and Al-Majidi, 2017, 448).
6. The researcher took into account the diversification and change in the rehabilitation exercises used in terms of the type of exercises and their basic conditions.
7. The rehabilitation curriculum was implemented by the assistant work team and under the direct supervision of the researcher.
8. The research sample members were instructed not to expose the affected area to any external stress or shock in order to avoid complications from the injury.
9. Gradual exercise in repetitions through the weights used in the curriculum.

The content of the qualifying exercises was

1. The exercises included working to control pain, rehabilitating the affected tissues, and focusing on correcting the work of the joint and

returning it to the normal position.

2. The difficulty of the rehabilitative exercises was adopted from (50%) until the injured reached a severe recovery (80%) for strength and range of motion exercises, and the number of repetitions and sets depending on the source. (2007,311K. Lee Lerner and Brenda Wilmoth Lerner).
3. The researcher's role was to supervise and follow up the progress of the application of the exercises in the qualifying sessions.
4. The time period for applying the qualifying exercises amounted to (8) consecutive weeks.
5. The number of qualifying units per week is (3) sessions on (Saturday, Monday, and Wednesday) of the week.
6. The total number of qualifying units (sessions) totaled (24) qualifying units.
7. The qualifying unit time is (30) minutes.

Post-test (final)

After the end of the qualifying curriculum period, the post-test was conducted on the research sample on Thursday, 12/9/2019 at five o'clock in the afternoon, taking into account the same conditions for the pre-test on a laboratory, as the researcher was keen to create the same conditions for the test in terms of time, place and the auxiliary work team The same (in the pre and post-tests) and tools and devices in order to stabilize the variables as much as possible.

Statistical means

The researchers used the Social Statistical Package (SPSS) to calculate each of the values of:

- Arithmetic mean.
- Mediator.
- Standard deviation.
- Coefficient of skewness.
- T-test for correlated samples.

3. Presentation, Analysis and Discussion of the Results

Presentation of the results of the pre and post test of the range of motion and transmission tests of the deltoid muscle of the shoulder joint for the research group and its analysis (Table 2).

Discussing the results

The researchers note, by looking at the results of Table 2, that there are differences in the arithmetic means between the two tests, the pre and post-tests, in the variables of motor range (extending backward, flexing forward, transmission) for the research group and in favour of the post-test compared to the tribal test, as mentioned (2009, 185, Hamill, Joseph) "Increasing the motor range means an improvement in the elasticity of the muscles and ligaments surrounding the joint, as well as an improvement in the neuromuscular work in controlling the work of the sensors responsible for providing sensory information to the brain about this range." Hence, the proposed device and the application of practical exercises prepared have a positive effect. In improving the motor ranges of the angles of the shoulder joint and its reflection on their athletic level and their return in the fastest period of time and their activity again, as indicated by Sorour Asaad, quoting (Matthews) "It is necessary to obtain a situation in which the main parts of the body are balanced and organized above the fulcrum, and the organizational relationship between These parts are intact so that it can perform its functions efficiently and with minimal effort." (Sorour Mansour, 1985, 15).

By reviewing the results, the researcher found that the improvement between the pre-test as well as the post-test led to a significant development in the forward-flexing test, which the researcher attributes to the rehabilitation exercises that contained different types of methods for developing the range

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

processors Variables	Meas unit	test before		post test		T	Sig	Indication
		Mean	St.d	Mean	St.d			
Tide forward shoulder	cm	17	1,826	22,75	1,708	99,139	0.003	Moral
Shoulder abduction movement	cm	35	3,559	39,75	3,304	5,563	0,011	Moral
Send	Degre	9	1,414	13,75	0,957	7,550	0,005	Moral

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

of motion before the static and mobile flexibility exercises, and the work of these exercises slowly and with the widest range Kinetic helped in obtaining these results as (obtaining sufficient flexibility for 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 performed in a wide range of movement as well as on the degree of flexibility previously acquired by the individual). (Al-Tikriti and Al-Hajar, 1986,118) By reviewing the results, the researcher found that the moral change in the range of motion and passing most of the variables to the minimum of the ideal range of motion to the effectiveness of the rehabilitation exercises on the proposed device in rehabilitating the affected area of the deltoid muscle because the exercises increase the flexibility and activity of the body It increases neuromuscular coordination. (Ahmed Al-Sabahi, 1973, 221) (Fouad and Hashem Al-Samarrai, 1988, 222) The researchers believe that the development that took place came as a result of the effectiveness of the vocabulary of the preparatory curriculum, which was prepared according to the correct scientific foundations and which depend on the efficiency of the exercises used in the preparatory curriculum prepared according to the proposed apparatus for it. From strengthening the muscle groups surrounding the affected shoulder joint. The researchers believe that accuracy in tennis skills is one of the priorities that the player must master in a high degree in all basic skills and most of the secondary skills, whether it is for the skill of serving or for the skill of the front and back ground strikes. The player's accuracy is the service strokes by raising the player's ability to place the sent balls inside the sending rectangle, first for the player's success in placing the ball inside the area designated for sending and secondly to increase the difficulty by placing the balls in areas that complicate the sending player to reach and return the ball and whenever The accuracy of the balls sent by the sending player increases, the more difficult it is to return the ball to the receiving player, and even if it is returned by the receiver, the ball is easy and within the reach of the sending player to finish and earn the point, in addition to the great role that fitness elements play in raising the level of skill performance (Al-Tikriti and Al-Hajar, 1986, 68) indicate that accuracy is positively affected by the development of other fitness components, and these are For a result consistent with what scientific sources indicate that quickly performing skills is at the expense of accuracy. When performing a skill at a speed that is not proportional to the nature of this skill, the performance result will be with little accuracy, and the movement time increases when accuracy is the primary goal for the player. (2011,164Lasazal Sazabo).

Conclusions and Recommendations

Conclusions

In light of the results of the statistical treatment of the data collected in the tests (cardiac and dimensional) of the variables, the research reached the following conclusions:

- Special exercises have a positive effect in rehabilitating the deltoid muscle in the shoulder joint.
- The special exercises have an effect by restoring the normal range of motion and the flexibility of the deltoid muscle of the shoulder joint among the members of the research sample.
- The development in the motor ranges of the shoulder joint is related to the demise of the pain, and therefore the positive effect of the rehabilitation approach in reducing or eliminating pain in it led to a clear improvement in the motor range.

Recommendations

Based on his conclusions, the researcher recommends the following:

- The necessity of using special exercises to rehabilitate the deltoid muscle injury of the shoulder joint and rehabilitate it in the treatment and rehabilitation centers for sports injuries.
- Paying attention to the principle of diversifying exercises and the type of tools used during rehabilitation to avoid boredom among the injured.
- The necessity of using the therapeutic and auxiliary means to rehabilitate the muscle injury in implementing the rehabilitative approach in a way that is compatible with the level of injury.

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