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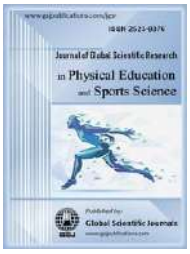

The Effect of Physical and Therapeutic Exercises on Functional Rehabilitation in Shoulder Joint Injury for Basketball Players

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ABSTRACT

The study aimed to identify the effect of physical and therapeutic exercises on functional rehabilitation in the injury of the shoulder joint for basketball players. Research impose : There are statistically significant differences between the results of the pre and post tests for the research variables and in favor of the post tests. The experimental method was used for its relevance to the nature of the research, and the two researchers conducted their research on players with shoulder joint injuries, who numbered (8) players from basketball clubs, the category of applicants in the province of Baghdad. Weeks of (18) rehabilitation units and applied in (3) units per week (Saturday, Monday, Wednesday) and main conclusions that the rehabilitation curriculum led to an improvement in the results of the dimensional variables, which represent the range of motion of the shoulder joint, and it was reached that the rehabilitation curriculum has a positive effect. In restoring the range of motion of the affected joint and improving the performance of the players.

1. Chapter One -Definition of Research:

1-1 Introduction and the importance of research:

The development and continuous scientific advancement have a clear and significant impact on the development of all fields, including the sports field, where this field has taken a wide space in the lives of peoples in all their interests, which required attention to the therapeutic sports movement to achieve the highest levels of sports achievement, whether using theoretical and applied sports sciences or Modern scientific and technical means.

Rehabilitation and therapeutic exercises are among the sciences that fall under the umbrella of sports medicine, in which man has become interested in research in many of its branches and departments to find the best and harness it in the service of mankind., in addition to the methods of training, prevention and treatment of injuries, nutrition ... and all the variables that occur inside the body during physical activity (Adel Ali Hussein, 1995) (1).

Rehabilitation, according to the World Health Organization (WHO), is defined as making use of a set of organized services in the medical, social,

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educational and professional fields in order to train or retrain the individual and bring him to the maximum level of functional ability (Majid Saeed Obaid, 2000) [(2)] .

The shoulder joint is one of the synovial joints that has a wide range of motion in various directions , and this movement is closely related to the integrity of the ligaments, muscles, and wallet in the shoulder joint. To develop muscle strength, joint flexibility and the degree of neurological compatibility to restore a normal state.

The methods of treatment (rehabilitation) have different means and methods, including the therapeutic exercises developed by specialists and researchers, which also differed in terms of time, intensity, frequency and quality of tests that measure the extent of the development of injury recovery and 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 Appearance of fatigue and range of motion .

The importance of research in the use of physical and therapeutic exercises for some shoulder joint injuries for basketball players, because this joint is of importance in helping individuals perform their skill and physical duties, since the movement of the upper limb depends mainly on the safety and effectiveness of this joint.

1-2 ***Research Problem****:*

The researchers, who are specialists in the sports field, confirm that the number of injuries is increasing day by day among athletes, up to our time, as a result of the high and continuous effort exerted on the organs and members of the athlete's body and as a result of the repetition of certain movements in many sports activities and events that require the performance of movements of medium or high intensity. With high frequency and repetition during training, in addition to the poor planning of training programs or training units in terms of increasing the number of units and disproportionate components of the training load in proportion to the player's ability to achieve, in addition to the lack of validity of the stadiums and tools used during training and competitions and the performance of exaggerated movements such as Repetition of movements in which the hand is above the level of the head that may lead to injuries, including injuries to the shoulder joint, as this joint is one of the most complex and most mobile joints and the most vulnerable to injury in athletes.

1-3 Research objective:

- The study aimed to identify the effect of physical and therapeutic exercises on functional rehabilitation in the shoulder joint injury of basketball players.

1-4 ***Research impose*** - There are statistically significant differences between the

results of the pre and post tests for the research variables and in favor of the post tests.

5 -1 Research fields:

1-5-1***The human field***: (8) players with shoulder joint injuries from the advanced club players in Baghdad governorate

1-5-2 ***Temporal field*****:** (24/9/2021) to (6/2/2022).

1-5-3 ***Spatial field*****:** Physiotherapy center for Sports medicine, Basketball Hall/ Baghdad governorate.

2- ***Chapter Two: Research Methodology and Field Procedure:***

2-1 Research method:

The researchers used the experimental curriculum with a single experimental set with tribal and post testing to suit the nature of the problem.

-2 Research Community and its sample :2

The research sample was tested by the intentional method of players with shoulder joint injuries, which numbered (8) players from the advanced clubs who represent (electricity, oil, police) in Baghdad Governorate, and their injury was of a medium degree[(*)].

-3 Means of collecting information, devices and tools used in the research:2

1- Arabic and foreign references and sources.
2- Data registration form.
3- A computer.
4- Vibrating massager.
5- The goniometer.
6- The dynamometer.
7- Infrared device.
8- Alamo device

2-*4 Tests and measurements used in the research:*

several variables and tests with different axes were selected, including physical tests and measurements of range of motion, and after they were presented to a group of experts with experience and specialization, the tests that obtained an agreement percentage (75%) and above were selected, and these tests are:

(A) test to measure the range of motion (flexion - extension - dimensions) of the arm at the shoulder joint by reading the degrees installed on the cytometer.

(B)) test to muscle strength test for the muscle group working on the shoulder joint to record the number of kilograms recorded on the dynamometer.

2-*5 Pre-tests:* The two researchers conducted the tribal tests of the search sample at the General Basketball Federation Hall/Baghdad Governorate, 2021/9/24 at 9 a.m.

2-*6 Suggested qualification program:*

After reviewing many studies, researches and references related to the topic of research and the means of physical therapy and rehabilitation used in the treatment centers, a rehabilitation curriculum was prepared, the aim of which is to strengthen the muscle group working on the shoulder joint, achieve balance between them and lengthen the ligaments related to the joint, which leads to an increase in the range of motion, The curriculum consists of six weeks with (18) qualifying units and it is applied in (3) units per week, namely (Saturday - Monday - Wednesday).

(*)The injuries were diagnosed by:

the specialist doctor Badran Abdel Razzaq / director of the specialized center for sports medicine.

The qualifying unit consists of several means and according to the order during the performance, which are:

1. Using some rehabilitation methods using physical equipment, as follows:

A - Using the infrared (infrared) device for a period of (5-10) minutes.

B - Using the magnetic waves device (ultrasound) for a period of (5-10) minutes.

C - Using the vibrating massage device for a period of (5-10) minutes.

2. Therapeutic and physical exercises:

The curriculum included exercises to increase the range of the joint and resistance exercises with the presence of repetition and with different intensity and rest periods between exercises for each device. In the sixth week, the therapeutic exercises also included a set of exercises to strengthen the muscles of the shoulder joint, which included exercises for raising, lowering and rotating the arm. These exercises are given after physical therapy devices (physical therapy).

***2-7 Post-tests**:* The two researchers conducted post-tests for the research sample . on 6/2/2022 under the same conditions as the pre-tests.

***2-8 Statistical methods**:*The two researchers used the statistical Pouch (SPSS) to find the appropriate statistical treatments.

3- Chapter Three: Presentation, analysis, and discussion of the results:

3-1 **Presentation of the results and discussion of the variables under study ;**

Table (1) shows the arithmetic means, standard deviations, and the calculated and tabulated (T) value of the pre and post tests for the variables under study.

Variables	Measuring unit	Pre-test		Post-tests		difference of Standard deviation	Level sig	Type sig
		Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
Flexion of the arm at the shoulder joint	Degree	115.0000	2.87800	147.8500	2.5230	-24.993	0.000	Sig
Dimensions of the arm at the shoulder joint	Degree	99.8750	2.03101	134.7375	2.66348	-23.653	0.000	Sig
Extension of the arm at the shoulder joint	Degree	29.1250	99.103	42.5000	1.77281	-26.870	0.000	Sig
Muscular strength	Degree	4.1250	64.087	8.0000	7.5593	-9.734	0.000	Sig
* Significant when the value of (sig) is less than or equal to (0.05) the results show that the value of the level of error (sig) is (0.000), which is less than the value of (0.05), which indicates that there are significant differences between the pre and post tests in favor of the post test for the experimental group								

Discussing the results:

The researchers attribute the moral differences of the variables under study to the effectiveness of the legalized and varied rehabilitation program, which includes different rehabilitation methods and exercises given according to correct angles of movement, which led to an improvement in the range of motion of the shoulder joint and by increasing the flexibility of the muscles surrounding the joint, as the rehabilitation curriculum helps prevent weakness And muscle atrophy, and it develops muscle strength and increases the flexibility of joints and ligaments "and stimulates the muscles and increases their ability to contract, and it regulates blood circulation in the joints and tissues and what surrounds them, and through it increases the range of

motion of the joints (Sumaya Khalil, 1990) [3] , as it is clear that this approach was appropriate For the physiological variables, enter the muscle through the shoulder joint range, which caused the emergence of the large extent of this joint in order to achieve good muscula torque fo flexing the movement.

The two researchers also indicate that the positive and effective results of the exercises applied by the sample members improved the muscular work of the main muscles working in the joints of the affected arm, represented by the movement of the shoulder girdle and elbow and then the arm as a whole, which increased the players' ability to sense movement and improve the angles of the participating body parts to serve The fluidity of the movement of the arm with a fast and elaborate motor performance, as well as the increase of coherence and motor coordination and its importance in transferring the amount of movement from the trunk to the arms through the shoulder joint, and this was confirmed by (Talha Hossam Al-Din, 1993) [4] , That the main goal in sports that contain the skill of throwing or pushing Or kicking is to achieve speed in the movement of the limb far from the body, and the mechanics of the movement of these parts must be

taken into account when choosing exercises for this type of performance ,This is what the two researchers sought to achieve through the rehabilitation approach, which worked to develop the angles and angular velocities of the affected part of the body in the research sample through various physical exercises, the most important of which are flexibility exercises. In the joint due to the changes taking place and the compliance of each of the muscle tendons, muscle fibers and connective tissues (Hazza bin Muhammad Al-Haza'a, 2009) [5], The two researchers also add that the inclusion of pregnancy in the rehabilitation program had a great impact in improving the range of motion, as the program was prepared according to the controls for muscle lengthening exercises, and then these regulated exercises led to an improvement in the range of motion, and there were no complications of injury due to the appropriate vocabulary and type of exercises used for the capabilities of The physical injured, and stated (Qasim Al-Mandalawi, Mahmoud Al-Shati, 1987) [6] , The rule of gradualness is a protection against disorders involved in the joints and muscle tendons, in other words, removing the state of rupture and muscle spasm." (Fouad Al-Samarrai and Hashem Ibrahim, 1988) [7], confirmed that stretching exercises are more effective when performed slowly and with full range of motion. Because the strong and rapid tension in stretching exercises gives negative results and may lead to injuries, and the lack of neural adaptation in the sensory receptors.

To prevent it from elongating, and that the rapid tension may cause a force in the wrong place and in the area of injury, which may increase its complications, The subacromial joint consists of the clavicle-acromial joint and the coracocamicus arch from above, the two tubercles, and the head of the humerus from below, with the subacromial bursa, which serves as a socket for this joint. (Ciullo, J. V., 1996) [8] , and this joint has two layers of muscles, the outer layer It consists of the deltoid muscle and the large rotator cuff and the muscles of the inner layer consist of the muscles of the rotator sleeve, which are: the supraspinal muscle, the subspinal muscle, the small rotator muscle and the subscapularis muscle. By the great tuberosity of the humerus and by the fusion of the rounded sleeve (1994 Marc G. Soble, Alan) [9] , The upper face of the subacromial joint consists of the arch, which consists of the clavicle from the front and continues to the acromioclavicular joint, and from the back it consists of the acromioclavicular bone and the plateau, and the anterior facet consists of the acromioclavicular belt and from below the subacromial bursa and the deltoid, and the lower facet of the joint consists of the two tuberosities and part From the anatomical neck to the head of the humerus , The subacromial and subdeltoid bursa does not have any contact with the acetabular cavity unless there is a complete rupture of the musculoskeletal tendon (Last, s anatomy 1990) [10] , (Cofield:, 1985) [11] , as the tendons of the rotator cuff muscles are combined and have the same place of impaction, The functional structure of the shoulder joint allows a high and large level of movement that differs from the

rest of the joints, this movement depends on the harmony and congruence of the head of the humerus with the acetabulum, as well as The mechanics of rotating quantum movement and the deltoid muscle (David W. Stoller, 1996).

Conclusions and Recommendations:

* The rehabilitation approach led to an improvement in the results of the dimensional variables, which represent the range of motion of the shoulder joint (flexion, extension, dimensions, muscle strength of the muscles working on the shoulder joint).

Recommendations:

* Emphasis on the adoption of the rehabilitation approach because of its role in restoring the range of motion of the affected joint, as well as in improving the form of performance.

* Adopting other rehabilitative means in treating and rehabilitating the shoulder joint and other variables, and selecting the rehabilitative curricula exercises in a manner consistent with the level of injury and fitness of the injured.

References:

[1]. Adel Ali Hussein; (1995) Sports and Health, 1st Edition, Alexandria, Dar Al Maaref for Publishing.
[2]. -Ciullo , J . V .,(1996) Shoulder injuries in Sports : Evaluation , Treatment , and Rehabilitation . Human

Kinetics,U.S.A .
[3]. -Cofield : (1985) Current Concept review – Rotator Cuff diseases of the Shoulder . Journal of bone and joint Surgery .
[4]. -David W . Stoller , and Eugene M , Wolf :(1996) , Magnetic resonance , the Shoulder in orthopedic and Sports medicine, (Second edition) , Chapter 9, . the Shoulder , Lippincott, Raven.
[5]. -Fouad Al-Samarrai and Hashem Ibrahim (1988) Sports Injuries and Physiotherapy, 2nd Edition, Jordan, Amman, Middle East Printing Company.
[6]. -Hazza bin Muhammad Al-Hazza; (2009) Physiology of physical effort Theoretical foundations and laboratory procedures for physiological measurements, Part 1, Kingdom of Saudi Arabia, King Saud University, Scientific Publishing and Press
[7]. -Last , s anatomy (1990) (eighth edition). Chapter 2 . Upper Limb .
[8]. -Marc G . Soble , Alan D . Kaye , and Robert C . Guy .(1994) Rotator cuff tear : Clinical experience with Sonographic detection . Journal of musculoskeletal radiology.
[9]. -Qasim Al-Mandalawi, Mahmoud Al-Shat(1987) Mathematical Training and Records, University of Mosul, Dar Al-Kutub for Printing and Publishing.
[10]. -Majed Saeed Obaid; (2000) Introduction to Rehabilitation of the Handicapped, 1st Edition, Amman, Dar Safaa Publishing.
[11]. . -Somaya Khalil; (1990) Therapeutic sports: Baghdad, Dar Al-Hikma
[12]. -Talha Hossam El Din; (1993) Biomechanics and theoretical and applied foundations, 1st edition, Cairo, Dar al-Fikr al-Arabi.
[13]. -Hilala Burhan Mahmoud; Comparison of the effect of using acupuncture and rehabilitative exercises to rehabilitate the partial rupture of the lateral ligament of the ankle joint in the clubs of the Sulaymaniyah Governorate Center, Letter, (College of Physical Education, University of Sulaymaniyah, 2014), pp. -.80-79

Appendix (1) Qualifying Unit Model

Machine Exercises				
Machine Name	**Frequency**	**Repetitions**	**Rest between Reps**	**Rest**
Infrared	5 – 10 Minutes	1	-	2 Minutes
Ultrasound	5 – 10 Minutes	1	-	2 Minutes
Massage	5 – 10 Minutes	1	-	2 Minutes
Warm-Up Exercises				
Warm-up Exercise	**Repetitions**	**Sets**	**Rest**	
1- Jumping Jacks	5	2	15 Seconds	
2- Front Arm Swing	5	2	15 Seconds	
3- Backward Arm Swing	5	2	15 Seconds	
4- Front Biceps Stretch	5	2	15 Seconds	
5- Backward Biceps Stretch	5	2	15 Seconds	