



E-ISSN: 2707-7020  
P-ISSN: 2707-7012  
JSSN 2022; 3(2): 01-04  
Received: 04-04-2022  
Accepted: 05-05-2022

Ali Abdulkadhim Shayyal  
General Directorate of  
Education, Missan, Iraq

## The effect of interfering electric waves and special rehabilitation exercises according to different angles in rehabilitating the range of motion and reducing the degree of pain in the frozen shoulder joint for diabetic patients men aged (50-55) years

Ali Abdulkadhim Shayyal

DOI: <https://doi.org/10.33545/27077012.2022.v3.i1a.87>

### Abstract

Understand the effect of interfering electric waves and exercises. Special Qualifications restoring range of motion and reducing shoulder pain levels in a set of methods with some of the variables used in the experimental approach to some different angles. A device to accurately produce those values in this study, including a video camera to photograph the sample members in the pre and post-tests and use the (goniometer) to find out the angle of the range of motion, and the pain degree from, Then the sessions, were applied to qualification afterward Remote imaging after the completion of the work application individually for each injured individual since there is a difference in the date of injuries for the research sample. The results were statistically processed using the program (SPSS) version 22, and several conclusions were reached, including:

- Restore the motor range well through the values achieved in the post-test results of the motor range test and the decrease in the level of pain when performing the movement.

**Keywords:** Range of motion, shoulder joint frozen, interfering electric waves

### Introduction

The use of therapeutic and rehabilitative means is appropriate to rehabilitate some cases, such as frozen shoulder joints, in which some people have diabetes. It is associated with these injuries, and patients usually suffer from such injuries due to excessive inactivity, immobility, or diabetes. In itself, and what accompanies these daily activities is sometimes the presence of inflammation in the joint. Frozen shoulder injury, also known as adhesive capsulitis, is a condition characterized by pain and stiffness in the shoulder joint. Signs and symptoms usually begin gradually. Sometimes, this injury occurs without tearing or signs of injury, that is, only limited joint movement, or it gets worse over time and then subsides, usually from one to three years (Brealey, Armstrong, & Brooksbank, 2017) <sup>[3]</sup> (CH & Walker-bone, 2015) <sup>[4]</sup>.

The importance of this study is restoring the range of motion and relieving the degree of pain in the frozen shoulder joint. Therefore, this study applied (the effect of the overlapping electric waves and special rehabilitation exercises according to different angles in the range of motion rehabilitation and relieving the degree of pain in the frozen shoulder joint for diabetic patients of men aged 50-55 years old).

### Objectives of the study

1. Preparing rehabilitation sessions that include (electrical waves and physical exercises). Special Rehabilitation for patients with frozen shoulder
2. It was knowing the effect of the rehabilitation sessions that included (electrical waves and exercises) Special rehabilitation) according to different angles to restore the kinetic ranges and reduce the degree of pain for frozen shoulder.
3. We are identifying the level of improvement of the rehabilitation sessions between the pre and post-tests of the research sample of patients with the frozen shoulder joint.

Corresponding Author:  
Ali Abdulkadhim Shayyal  
General Directorate of  
Education, Missan, Iraq

### Study assignment

1. There are significant differences between the rehabilitation sessions and the overlapping electrical waves in the frozen shoulder joint.
2. There are significant statistically significant differences between the pre and remote tests of the study variables, the range of motion, and the degree of pain in the joint of the frozen shoulder.
3. There are significant statistical differences in the percentage of improvement of the study variables, the range of motion, and the degree of pain in the frozen shoulder joint.

### Material and Methods

Rehabilitation sessions are one of the most important ways to solve the problem, so the researcher adopted the experimental approach in a one-group style. The study sample included some diabetic patients with frostbite of the shoulder (6) injured; some of the study variables used for the shoulder were confirmed by physicians whose ability to verify the period and extent of the injury. The researcher used Arab and foreign sources, a video camera, and some measuring tools for angles. The sample was photographed before the qualifying sessions were held. To measure the range of motion and the degree of pain, implement the rehabilitation sessions that include (electrical waves and exercises). Particular qualifying (series of shoulder exercises at 0-45, 0-90, and 0-180 degrees, training continued until (8 weeks), all recorded casualty rehab on Monday, May 20 17th 21b of the shoulder joint in the same position and at the same time for each sample size tested and tested after the application deadline, using the rehab course and then taking the measurements (angle of motion range) by the test set for the study and by the World Health Organization-approved medical forms for measuring pain levels (zero to ten) and statistical program (SPSS) versions for understanding pain levels used 22.

### Tests used in the research

#### Range of motion tests (clair, 1987) <sup>[5]</sup>

1-flexion test 2- Extension test 3- Adduction test 4- Abduction test 5- Internal rotation test (internal rotation) 6- External rotation test (lateral rotation) 7- Test shoulder elevation

#### Degree of pain Sied Youssef, Mervat, (2005) <sup>[11]</sup>

#### PRE- tests

After conducting pre-tests on time, at four o'clock in the afternoon in one of the treatment and rehabilitation centers and with the help of the assistant team on the research sample on Saturday, 14/5/2021 and taking into account the particular circumstances of all the study tests in terms of the tools and devices that were used in the study, as well as the application and implementation.

#### Post-Tests

After completing the application of the preparatory sessions for the group of patients with frozen shoulder joint injury, the researcher conducted the post-tests on 7/18/2021, corresponding to Tuesday at four o'clock in the afternoon, under the same conditions that were set for the pre- tests to preserve the accuracy of the results.

### Components of the rehabilitation session

After preparing and providing all the requirements for applying the preparatory sessions and controlling all the variables for that study, the researcher designed the introductory sessions with (interfering electrical waves and exercises). (Special qualification) where the researcher relied on the survey to analyze all the results, data, and scientific references that are relevant to this study:

- Determining the number of weeks for the qualification sessions to be (8) weeks and at a rate of (4) qualification sessions per week, i.e., the total of the qualification sessions (32) training sessions, the duration of the qualification session throughout the three stages ranges from (30 - 60) minutes. The researcher worked at the preparatory sessions on the principle of gradation from easy to difficult, time, and repetition of the exercises.

### The qualifying sessions were divided into three phases

The first stage included (12) preparatory sessions, the duration of the rehabilitation session (20-30) minutes, the time of the interfering electrical waves (10) minutes, and the rehabilitation exercises (20) minutes.

### Where is the goal of the first stage?

Reduce the degree of pain. Improvement of the range of motion of the kinetic joint (flexibility). Developing muscle strength and lengthening the muscles surrounding the shoulder joint. The second stage included (10) rehabilitation sessions, and the duration of the rehabilitation session was (30-45) minutes, where the period of the interfering electrical waves was (15) minutes, and the rehabilitation exercises (were 30-45) minutes.

### The goal of the second stage

Save the degree of pain. Development of a passive range of motion of the shoulder joint. Resistance and balance exercises. Shoulder joint return to normal by 50%  
The third stage included (10) rehabilitation sessions, and the duration of the rehabilitation session was (45-60) minutes, where the period of the interfering electrical waves would be (20) minutes and the rehabilitation exercises (30-60) minutes

### The goal of the third stage

Achieving range of motion, strength, and muscle lengthening surrounding a joint close to the normal condition of the shoulder. Achieving complete stability and balance. Doing daily business and activities normally  
The researcher used the statistical group (spss) version v 22 to extract the following values: - Percentage - Arithmetic mean - standard deviation - T-test of correlated samples - percentage improvement.

### What does this study add?

- The use of overlapping electric waves of more than one electrode or current on the frozen shoulder joint is highly effective in relieving pain and then giving great freedom to perform motor exercises without feeling excruciating pain in that joint through the use of those waves that work to alert, and stimulate cells in the body Or the area around the frozen shoulder, which in turn releases morphine from the body. This morphine reduces some of the chemical secretions responsible for feeling pain and inhibits activities in the nerve fibers,

- the carrier, and the feeling of pain relief.
- The use of special rehabilitation exercises, gradual in repetitions, according to the gradation of the patient's range of motion angles.
- The use of rehabilitation exercises for angles according to the level of range of motion of the joint.

**Discuss Results**

Values circles Arithmetic and the computed value (t) for every from the exams pre and dimensionality in some (extension, bending, approximation, dimensions, rotation, flexibility, pain)

Statistics	Pre-test				Post-test			
	M	Std	M	Std	The difference	t-test	Gain%	Sig
Flexion	38.358	0.484	43.610	0.530	5.252	13.072	%56.39	0.000
Extension	168.580	0.751	176.295	1.0388	12.715	15.311	%76.29	0.00
Addition	35.996	0.648	38.171	0.496	2.175	6.415	%61.82	0.01
Abduction	165.808	0.728	176.858	0.648	11.05	25.131	%76.85	0.00
lateral rotation	84.941	0.602	88.483	0.803	3.542	8.613	%11.51	0.00
internal rotation	84.550	0.709	88.091	0.546	3.541	10.307	%86.90	0.00
shoulder elevation	41.918	0.540	51.350	0.498	9.432	34.640	%48.64	0.00
Pain degree	5.333	0.816	2.666	0.516	2.667	8.000	%97.33	0.000

It is clear from the table and their analysis that the statistical processes of the kinematic range measurement tests according to the angles of the shoulder joint were significant for the research sample and showed signs of improvement for those results in the kinetic range and pain relief in the frozen shoulder joint. Which expressed the values of the different angles appearing in progress, as the improvement was the result of the electric waves, and (special qualifying exercises) used in those rehabilitation sessions, which included gradual activities with (Strength, elongation, flexibility, and balance) at specific angles and according to the rehabilitation sessions and recovery periods, which gave better ranges of movement and more minor pain relief, and that working with the principle of gradual movement with different angles works effectively For rehabilitation in such a type of injury, since this method is usually used with any motor joint, where a certain amount of force can be applied in the rehabilitation sessions so that it does not cause damage to the joint and works with a simple gradual range of motion within the different angles designated for each A stage in the sessions, taking into account the pain in the shoulder joint, then it returns to the zero point and continues to perform for specific periods until it reaches the normal range of motion.

The methods and means of electrotherapy (also known as electric waves) are considered a type of physical therapy and rehabilitation that aims to reduce pain and improve function by increasing the energy of currents (electrical, sound, light, and heat) in the body. Examples of this are waves Therapeutic Ultrasound, Low-Level Laser Therapy (LLLT), Interferential Current, Transcutaneous Electrical Nerve Stimulation (TENS), and Pulsed Electromagnetic Field (PEMF) Therapy. Rarely do patients with frozen shoulder receive a single modality of electrical therapy independent of the components. Other physical therapy (for example, manual therapy, exercise), i.e., exercises and waves, have an influential role in improving the frozen shoulder .(J Page, Green, & A Mrock, 2014) [7].

Patients with frozen shoulders often report painful and unpleasant onsets with a gradual increase in pain. Then the use and application of the wave therapy sessions will be a gradual decrease in the range of pain and activity in the shoulder movement. (Kelley, 2009) [10] (Gaspar P & WILLIS B, 2009) [6].

For this reason, low weights and repetitions were used at the beginning of this Phase (0-90 degrees) (Kaghem, Adel, & Abdul, 2019) [9].

The researcher attributes following the suitable and scientifically studied rehabilitation methods represented by electric waves and special rehabilitation exercises. These exercises contain (flexibility, lengthening, resistance, strength, and balance) which gave precise results with improvement within the suitable gradual ranges of movement, and through the application of rehabilitation exercises with waves according to different angles to rehabilitate the injury that led to the emergence of the results of this study after the post-tests, which It gave apparent credibility to this study by increasing the muscle elasticity of the injured, and increasing the flexibility of the joints.

"Resistance exercises for one group separately lead to an increase in strength if these resistance contractions of the primary motor muscles are alternated with the corresponding muscles. is due to the recruitment of the largest possible number of muscle tissue and motor units. (Muhammad Hassan Allawi, 1994) [1].

The muscle's ability lies in the possibility of generating force. Individuals vary among themselves in the production of power due to the following factors: motor units and muscle size), the angle of the joint, the length of the muscle, and the speed of work. Salama, (2000) [2].

confirms that the technology of interfering electric waves therapy comes from among the essential and auxiliary means that work to emit emissions of the necessary, harmless activity to restore vitality and blood supply to cartilage, muscle tendons, and ligaments, as well as the treatment of interfering electric waves, helps in the processes of renewal and restoration in cells The joint.

The sooner the patient implements therapeutic and rehabilitation sessions with waves and exercises, the greater the chances of recovery become.

Hence, the researcher also sees that these pulses in the overlapping electrical waves work by directing those pulses according to standards on scientific grounds, where the process of sending electrical impulses through transmitters is carried out and headed towards the affected area, and thus will lead to stimulation, and activation of the cells of the area infected patients without any complications for those with chronic diseases or Side effects, and the period of treatment or rehabilitation sessions with ultrasound depends on the target area and the degree of injury. Pain-carrying neurotransmitters lead to the release of natural analgesic endorphins in the body (Kans 2009) [8].

**Table 1:** Special rehabilitation exercises in the rehabilitation of a frozen shoulder joint injury note: All these exercises were used at angles (20-30) to rehabilitate the frozen shoulder common injury

Rest between repeats	Number of sets	Rest between repeats	repeats	Time of performance	Exercises
25	-	sec 35	3	sec 35	(45°) (warm-up) forward rotation
=	-	22	5	sec 22	Dowel assisted shoulder flexion(45°)
=	-	sec 25	5	seconds 25	Dowel assisted shoulder abduction(45°)
=	-	sec 22	5	sec 22	Dowel assisted shoulder extension
=	-	sec 21	5	sec 21	Dowel assisted internal shoulder rotation
minute 10					Interfering electric waves

**Conclusions**

1. Rehabilitation exercises and electrical waves at different angles have an apparent effect on improving the restoration of the typical ranges of motion for the injured in the frozen shoulder joint.
2. Pain relief was significantly improved in patients with stiff shoulders.
3. The sessions prepared in the rehabilitation have directly contributed to reducing the rehabilitation period for those with frozen shoulders.

10. Kelley M. Frozen Shoulder: Evidence and a proposed model guiding rehabilitation. *J Orthop Sports Phys Ther.* 2009;39:135-148.
11. Sied Youssef, Mervat. *Sorts medicine problems.* Alexandria: Sgahbani Library, 2005.

**Recommendations**

1. Attention should be paid to applying the qualification sessions and following the gradual sessions, from easy to complex.
2. The researcher recommends conducting similar studies on some frozen joints to know the extent of the effectiveness of this study on other frozen joints.
3. The researcher recommends spreading awareness and health education among the community, especially those with diabetes, to practice healthy and correct sports activities to prevent injuries.

**References**

1. Muhammad Nasr, al-Din Radwan Muhammad Hassan Allawi. *Motor performance tests.* Cairo: Arab Al fakir dar, 1994.
2. Bahaa El Din Ibrahim Salama. *Sports physiology and physical performance blood lactate.* Cairo: Arab AL fakir dar, 2000.
3. Brealey S, Armstrong A, Brooksbank A. effectiveness of early structured physiotherapy versus manipulation under anaesthesia arthroscopic capsular release for patients referred to secondary care with a primary frozen. *Technium Social Sciences,* 2017, 614.
4. CL, Walker-bone K. *Shoulder Disorders and occupation,* 2015, may 8. Retrieved from PMC4836557: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4836557/>
5. Clair C. *Measurement of joint.* Philadeohia: Clair, 1987.
6. Gaspar P, WILLIS B. Adhesive capsulitis and dynamic splinting: a controlled, cohort study. *BMC Musculoskeletal Disorders.* 981 Lomas Santa Fe: Free PMC article, 2009.
7. J Page M, Green S, Mrock AM. *Electrotherapy modalities for adhesive capsulitis (frozen shoulder).* Retrieved from Cochrane database, 2014, Oct 1. <https://cochrane.altmetric.com/details/2731680>
8. Jeffrey ANN Kans. *Treat back pain.* kungdom of saudi Arabia: al Jezzeri library, 2009.
9. Kaghem L, Adel E, Abdul Y. *Impact of rehabilliative exercises according to gradual kinatic aparxia from*