Effect of Rehabilitation Program for Shoulder Dislocation Post Arthroscopy Reconstruction on Patient Expected Outcome

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Abstract

Background: Shoulder dislocation occurs when the "ball" of your humerus (upper arm bone) is pulled out of its normal position in the shoulder "socket" (glenoid labrum). A dislocation is accompanied with extreme pain and an inability to move the arm until it is relocated back into the socket **Objectives**: was to assess The effect of rehabilitation program for patient with shoulder dislocation post arthroscopy reconstruction. Setting: The study was conducted in orthopedic unit on Nasser Institute. Affiliated to the secretariat of specialized medical centers, Ministry of health, Cairo, Egypt. **Subjects**: The study. Comprised a purposive sample of 40 adult patients with shoulder dislocation scheduled for arthroscopic repair was included and assigned alternatively into two equal groups; The patients were divided randomly into two equally groups each of (control and study group) 20 patients.. **Tools**: four tools were used Tool I: Patient's Assessment Structure Interview sheet**:** Tool II: Mobility Index of the shoulder, this tool was divided into two parts, part I: Muscle strength assessment scale, Part II: shoulder range of motion assessment sheet. Tool III Shoulder Pain and Disability Index, and tool IV: The disabilities of the arm, shoulder, and hand (DASH) outcome questionnaire. **Results**: the pain scale after three months of applying of exercise program; 60% of the intervention groups patients had no pain and control group (60%) suffer from moderate pain; was statistically significant as FEP=0.000., in relation to DASH, there were statistically significant difference between both groups second and third month postoperative for control and intervention groups (p=0.002) and (p=0.000) respectively. **Conclusion**: Applying rehabilitation program for patients with shoulder dislocation post arthroscopy reconstruction significantly improved the studied patients' pain intensity, shoulder muscle strength, range of motion, disabilities during active activities postoperatively than their control**.**

Keywords: Rehabilitation program, shoulder dislocation**,** arthroscopy reconstruction, expected outcome.

Introduction

One of the most frequent severe injuries to the shoulder is a dislocation. The shoulder is the joint most prone to dislocation since it is the bodily part with the greatest range of motion and mobility **(Kauta et al., 2023).**

A "ball and socket" joint makes up the shoulder joint. The glenoid, a portion of the scapula, is where the ball at the top of the arm bone (humerus) glides and rotates to cause shoulder mobility. Normally, soft tissue that fits over the joint like a sock holds the shoulder in its socket. The surrounding muscles and ligaments, as well as the fibrous tissue inside the joint capsule, further stabilize this (**Rybski, 2024).**

Because of the shoulder's wide range of motion and relatively shallow shoulder socket, falls and vigorous sports activities can cause the shoulder to become unstable and dislocate. Robust muscles are essential for stabilizing the shoulder joint. The force responsible for a shoulder dislocation frequently tears the surrounding tendons, ligaments, and muscles. In the expanding population, instability is a common issue that affects the shoulder **(Micheo et al., 2023).**

Shoulder dislocation occurs when the glenoid labrum, the shoulder "socket," or upper arm bone, wrenches the humerus, or "ball," out of its normal position. Shoulder dislocation occurs when the glenoid labrum, the "socket" that houses the ball" of the humerus, or upper arm bone, is wrenched out of its normal position. When an arm dislocates, it hurts so much that it is immobile

until it is put back into its socket (**Hibberd et al., 2023).**

Trauma accounts for the majority of shoulder dislocations, and if the injury results in structural damage, it may set off recurring instability. Between 15.3 to 56.3 main shoulder dislocations occur for every 100,000 person-years. Most dislocations are caused by sporting injuries, and most patients are men under 40 **(Ashri & Alon, 2021).** Given these two realities, shoulder dislocation and the potential for chronic instability may pose a significant health risk to young, active individuals and the medical professionals who treat them. Closed reduction is the first line of treatment for a dislocated shoulder, and it should be done as soon as possible in an emergency room or on the field. Even during routine activities, some individuals experience recurring dislocations or symptomatic subluxations. This has led to recommendations that, following the initial dislocation, surgical stabilization might be necessary. For this group of people, surgery is usually advised to repair the damaged structures, particularly if they are young and active **(Jayakumar et al., 2020**).

Results from arthroscopic Bankart repair (ABR) for shoulder instability are tolerable. Recent research, however, indicates recurring rates ranging from 4% to 19%. A number of variables have been connected to recurrent instability: Male gender, early age at surgery, hyperlaxity of the joints with participation in contact sports, early return to contact sports, and extent of the humeral defect (Hill-Sachs lesion), and bone abnormalities. Furthermore, a recent study revealed that the recurrence rate dropped for up to five years after ABR, with 55% of re-dislocations occurring within the first year (**Jayakumar et al., 2020**).

Therefore, in order to enhance patient outcomes, prevent further dislocations, and emphasize the need for comprehensive rehabilitation, it is essential to strengthen and rehabilitate the deep shoulder muscles. Rehabilitation can begin as soon as the shoulder has been returned to its normal position. Rehab is necessary and can take up to a year to finish completely. In the first three weeks after a shoulder dislocation, shoulder pain and trouble sleeping can be problematic; beyond that, the recurrence rate can drop for up to five years **(Goldenberg et al., 2021).**

More than 50% of individuals under conservative management will frequently become disoriented. Consequently, a move toward prompt surgical intervention has occurred to reduce the incidence of recurrent dislocation. Currently, the most popular procedure for anterior shoulder instability is arthroscopic Bankart repair. The Laterjet is becoming more and more common when osseous glenoid abnormalities are present **(Rutgers et al., 2022).**

The healing of damaged or repaired soft tissues is protected by improved post-operative outcomes, which may also lower the risk of future re-injury or recurrence. These outcomes include the return of painless range of motion and strength, stability, and soft tissue mobility, in addition to dynamic stability, balance, and strength surrounding the shoulder glen humeral joint. These are the main objectives of postsurgical arthroscopic shoulder dislocation rehabilitation. As a result, the necessity of rehabilitation increases, and patients who have had arthroscopic shoulder dislocations require highly skilled multidisciplinary teamwork to act quickly and effectively as well as to enhance the results of their surgery **(Kauta et al., 2023**).

The nurse uses the patient outcomes as a benchmark to determine whether goals have been reached and, consequently, whether the treatment has been successful. In order to achieve the intended and favorable results, Nurses possess a unique opportunity to establish rehabilitation programs that improve patient compliance and suitably equip patients for post-hospital self-care at home. It is difficult and complex to deliver healthcare in a timely, professional, and economical manner **(Lewis, et al., 2016).** One important component in the effectiveness of arthroscopic dislocation surgery is pre- and post-operative rehabilitation. Rehabilitation nurses offer care that minimizes problems and aids in function restoration and maintenance. They also offer counseling and education to patients and their families. But nursing is crucial to the patient's healing and advancement; without skilled nursing care, the rehabilitation may not be successful **(Hydeetal, 2021).**

The training and guidance of patients on range of motion and exercise techniques by

nurses is widely regarded as a crucial aspect of their recovery and advancement in their condition. The primary objectives of the nurse are to alleviate pain and stiffness in the shoulder, restore normal joint motion, and fortify the muscles surrounding the shoulder. Additionally, they monitor the patient for any indications of difficulties or issues and monitor their progress after surgery **(Rutgers et al., 2022).**, so we conducted the present study to assess the effect of the effect of rehabilitation program for shoulder dislocation post arthroscopy reconstruction.

Materials and Method

Research design:

In this study, a quasi-experimental design was employed. Prospective study design was employed in the research.

Setting: The study was conducted in orthopedic unit on Nasser Institute. Affiliated to the secretariat of specialized medical centers, Ministry of health, Cairo, Egypt.

Subjects:

40 adult patients with shoulder dislocations planned for arthroscopic treatment were enrolled in the study and randomly assigned to two equal groups using a purposive sample; Randomly selected patients were split into two equal groups (control and research group). 20 patients. For six months, **the study group (I**) adhered to a nursing rehabilitation program**. The control group (II)** received standard hospital treatment. The following characteristics were used to estimate sample size using Epi info 7:(Total number of populations was 60 in 2022; Expected frequency: 50%; Maximum error margin: 10%; 95% confidence coefficient; Approximate sample size: 38.

Patients' inclusion criteria:

Patients with cancer of shoulder dislocation, over 18-60 years of age and scheduled for arthroscopic repair; Free from A clinical diagnosis of glenohumeral osteoarthritis (OA)& adhesive capsulitis; Having no previous shoulder surgery and physically fit to follow rehabilitation exercises.

Tools

Tools:

After reviewing pertinent literature, the researcher employed four instruments to gather the required data:

Tool I: Patient's Assessment Structure Interview sheet:

Researchers created this tool after reviewing the literature **(Ezell& Malcarney,2021& Akhtar et al., 2021)**, to gather the necessary baseline data and was divided into two sections: A **sociodemographic feature** This section was used to gather patient personal information, such as age, gender, place of residence, educational attainment, and employment, as well as **clinical information**, such as trauma mechanism, prior hospitalization, medical history, surgical history, current health issues, and preoperative physical therapy.

Tool II: Shoulder Mobility Index:

This tool, which was created to gather mobility data, is composed of three components.

Part I: Scale for assessing muscle strength: This section was adapted from **(Brandsma et al ;1995)**. to evaluate muscle strength. The deltoid, biceps, and triceps muscles were evaluated as part of this. The scale consisted of six points, with zero denoting neither paralysis nor muscle contraction, there are five types of ranges of motion: The first two represent range of motion in passive form; the third represent range of motion that is active against gravity; the fourth represent entire range of motion up against some opposition; and the fifth represent full active range of motion with total resistance. One represents felt muscle contraction but no limb movement.

Part II: Assessment sheet for shoulder range of motion: This section was adapted from **(Carter et al., 2008 & Yang et al., 2015**). In the current study, the researcher employed a goniometer to determine the active or passive joint range of motion in degrees using joint angles. Only the surgically repaired shoulder's range of motion was examined, and patients were positioned while active shoulder flexion and extension were assessed. Joint range of motion readings were categorized as normal, limited, or non-existent based on comparison to the typical value for each range.

Tool III: Shoulder Pain and Disability Index (SPADI)

This tool was adopted from **(Roach K et al 1991)** and updated by **(Christensen et al., 2019),** It is a self-administered questionnaire with two sections: one measuring functional activities and the other pain. Five questions on the intensity of a person's pain make up the pain dimension. Eight questions are used to evaluate functional activities, gauging how difficult it is for a person to perform different daily tasks involving the use of their upper extremities. The only accurate and dependable region-specific measure for the shoulder is the 5-to 10-minute SPADI, which patients may complete in that amount of time. Patients express their response to each question by marking it on a 10-cm visual analogue scale. "No difficulty" and "so difficult it required help" are the verbal anchors for the functional tasks, whereas "no pain at all" and "worst pain imaginable" are the verbal anchors for the pain dimension. The final score is calculated as the average of the two dimensions' scores. The two subscales' averages are averaged to get the overall score, which goes from 0 (best) to 100 (worst).

Tool IV: The disabilities of the arm, shoulder, and hand (DASH) outcome questionnaire

The DASH18 is a symptom and disability assessment tool that is region-specific and can be used by individuals with one or more upper limb musculoskeletal illnesses. The questionnaire asks about the following: how difficult it was to perform different physical activities in the previous week due to shoulder, arm, or hand problems (21 items); how severe pain, activity-related pain, tingling, weakness, or stiffness is (5 items); how the problem affected social activities, work, and sleep; and how it affected one's mental health (4 items). Each item has five response options: 1 (easy to do, no symptoms, no impact) to 5 (impossible to complete, extremely severe symptom, significant impact). After adding up all the replies to the 30 questions, a raw score is created. This raw score is then multiplied by 25 to create a 0-to-100 scale using the formula [(sum of score/n) – 1] × 25. Greater disability is reflected in a higher score. The average of the answers to the questions that were completed and used to replace each missing item if the respondent leaves less than 10% of the items blank.

Method

The following was done to complete the study: The Ethics Research Committee of the Faculty of Nursing at Modern University granted approval, and the Faculty of Nursing at Nasser Institute provided an official document outlining the study's objectives. The researchers created tools and translated them into Arabic based on a recent survey of pertinent literature.

Validity and reliability: A panel of three orthopedic surgery specialists and five medical surgical nursing professionals evaluated the validity of the study instruments. The Cronbach's alpha was used to test the study tools' reliability. All of the tools had reliability coefficients of (0.781) for tool I, (0.917) for tool II, (0.946) for tool III, and (0.090) for tool IV.

Pilot study: Prior to the main study, a pilot study involving four (10%) patients was carried out to determine the viability and applicability of the various tool items, determine the most efficient and thorough method of gathering the required data, and pinpoint any potential challenges that might arise. The instruments were modified.

Data collection: The researcher used one-on-one interviews to gather data for each patient. Ten months of data collection, from May 2022 to February 2023, were completed. An hour was allotted for each interview. Regarding the sessions, each patient was expected to spend 20 minutes covering theoretical knowledge and the remaining 40 minutes on shoulder exercise demos and redemonstrations.

The research was conducted in four stages:

Assessment phase: The researcher conducted individual interviews with each patient in the study and control groups to ensure that all information was kept private and used solely for research purposes. An initial assessment of every patient (control group and study group) was carried out prior to the commencement of the rehabilitation program. The glenohumeral joint will be immobilized in an internally rotated and adducted posture for two to six

weeks to allow the wounded capsule to scar. Numerous investigations concluded that immobilization in external rotation dramatically lowered the instability recurrence rate in both chronic and first-time dislocaters. This phase's objectives are to reduce discomfort, inflammation, and spasms in the muscles; restore dynamic stability and pain-free range of motion; postpone the atrophy of the muscles; enhance proprioception; and safeguard the repairing capsular structures.

Assessment was carried out two, four, and six months after the rehabilitation program was put into place to assess its impact on the functional ability of the arthroscopic rotator.

Planning phase: - The researchers created an instructional handout booklet in simple Arabic based on the data gathered from the assessment phase and a study of pertinent recent literature **(Berton et al :2020, Kim& Lee:2022)** to bolster the information provided. This pamphlet included straightforward graphics in color. Simple notes about the anatomy and functions of the shoulder are included, along with information on shoulder arthroscopy, signs and symptoms, causes of repair, treatment options (medical or surgical), pre- and post-operative instructions, exercise regimens (types, frequency, and duration), and complications signs and symptoms. - Among the teaching techniques employed were the following: interactive talk/discussion, with demonstrations of shoulder exercises and a follow-up.

Implementation phase: (The study group's nursing rehabilitation sessions included the following: Using demonstration, redemonstrations, and colored booklets, every patient in the patient department received the personalized rehabilitation program that was designed. It was then continued in the outpatient clinic and rehabilitation center linked with the hospital. Until the investigator was satisfied that the patient had acquired the abilities, patients were asked to repeat the activity. During the early recovery phase, each exercise was done for 10 to 15 minutes, twice or three times a day.

There were four phases to the program, which were as follows:

First session; immobilization in the weeks following surgery Protecting tendon restoration and fostering tendon-to-bone healing are the main objectives. A workout scenario including a 6-week period of immobility with a sling Elbow AROM (no active elbow ROM for 4-6 weeks) and hand, wrist Exercises for scapular mobility with a sling and neck exercises.

Second session: passive range of motion (6-10 weeks after surgery) goal of this exercise Reducing pain, prevent postoperative scar adhesions and stiffness, Sling can be gradually removed example of exercise for this period: Supine passive shoulder elevation with patient or assistant 0-100 degrees Seated Passive External Rotation with PT or assist a forward elevation. At this time, pendulum exercises are started. At six weeks, scapula workouts start. Exercises for the scapula should include protraction, retraction, depression, and shrugs.

Third session: Active Assisted range of motion (Weeks 10-14) goal of this exercise increase shoulder range of motion, strengthen muscles, reduce stiffness, and improve arm control. The patient elevates their stricken arm forward, rotates it externally, and abducts it using their other arm, a cane, or a stick while they remain supine. Week 10 is spent with the patient supine; Week 11 finds them 45 degrees upright; and Week 12 finds them fully upright. After week 12, the patient can utilize pulleys for forward elevation when doing Wall Slide and Wall Walk.

Fourth session: active range of motion (14–18 weeks): While continuing to focus on active assisted motion, the patient begins active range of motion in forward elevation, external rotation, and abduction. External rotation of the shoulders AROM when standing and side-lying Exercises for isometric strengthening also start at this point.

Five session: **Initial Strengthening exercise (18-22 weeks after surgery)**; Returning to regular functional activities of daily living, full-time employment, and reduced recreational activities are the objectives of this exercise throughout this phase. Example of exercise Internal Rotation Stretch: Shoulder extension

with straight arm Biceps Curls, Triceps Extension

Evaluation phase: Using all study instruments, every patient in both cohorts underwent three assessments: once before the program was implemented, and once more three and six months later (Tools I, II, III & IV).

Ethical consideration:

Patients' written informed consent will be obtained both prior to and after the study's goal is explained; confidentiality of the information gathered will be guaranteed; The study participants' privacy will be protected, and the researchers will stress that participation is completely optional and that leaving the study won't have an impact on the care they receive from the hospital or the study itself.

Results

Regarding Scio demographic a clinical presentation of two groups; (table 1) shows patients' age, the mean ± SD age was 33.36 ± 8.65 years and 32.28± 8.84 years for control and intervention groups respectively. There was no statistically significant difference between both groups (t = 0.43 P = 0.66). In relation to patients' gender, the highest percentages in both groups were male patients 55.0 % and 60.0 % for control and intervention groups respectively. As dislocation. However, (95-100%) in both groups had not a pervious shoulder surgery; in both groups as shown (85- 80%) did not suffer from any associated diseases

Table (2) shows muscle strength in both groups; After one month of surgery, every patient in both groups had sufficient muscle strength to resist gravity. 80% of the intervention group's patients were still holding against their maximal resistance three months after the procedure, compared to eighty-nine percent of the group two months later. Yet, after three months, 60% of the control group (eliminated by a hole against gravity) showed a highly significant difference (p=0.000) between the two groups.

Table (3) shows shoulder ROM, the table shows that, the range of motion measurement, in control group the mean ± SD one month post-operative was ($\overline{X}$ = 179.68±0.80) while after two months postoperative, it was ($\overline{X}$ = 171.36 ± 10.82) and after three months, it was ($\overline{X}$ = 177.80± 3.31) . While in the intervention group, the mean ± SD two weeks post-operative was ($\overline{X}$ = 179.64±1.03) while after two months postoperative and performing exercise, it was($\overline{X}$ = 156.88 ±8.59) and after three months of preforming exercises, it was($\overline{X}$ = 157.56± 7.57). In the first month following surgery, there was no statistically significant difference observed in the range of motion measurement between the two groups (t=--0.153 p= 0.879). However, in the second and third months following surgery, there was a statistically significant difference observed between the active exercise group and the self-exercise group (t= -5.238 p= 0.000 and t= -12.242 p= 0.000), respectively.

As evident from the **table (4)**, the pain scale after three months of applying of exercise program; 60% of the intervention groups patients had no pain and control group (60%) suffer from moderate pain; was statistically significant as **FE**P=0.000.

Assessment of shoulder disabilities during activities reveled that: **Pain at its worst**, 60% of the control group patients suffer from severe pain, while 75% of the intervention group patients suffer from mild pain. Additionally, 90% of patients in the control group and 75% of patients in the intervention group reported having mild pain when they were lying on the affected side, respectively. Ninety-five percent of the patients in the control and intervention groups experienced moderate pain when reaching for an item on a high shelf, while eighty percent of the study group experienced mild pain. Conversely, when the back of the neck is touched, 60% of the patients in the control group experience moderate pain, and 60% of the patients in the intervention group experience mild discomfort. However, 90% of the control group experienced considerable pain while pushing with the affected arm, while 90% of the intervention group experienced mild pain.

In table (5); DASH for both groups post shoulder surgery, 1-month post-operative, percentage of DASH score was (0.82) for control group and (0.83) for intervention group, there was no statistically significant difference between both group (P = 0.592). While, there were statistically significant difference between both

groups second and third month postoperative for control and intervention groups (p=0.002) and (p=0.000) respectively.

Table (1): Socio-demographic characteristics and clinical data of patients in the control in terms of education, the majority of patients (30.35%) in both groups had a high level of education. Regarding the patients' occupations, professional work accounted for the largest percentages in both groups (50.0 % and 55.0 %, respectively). Concerning mechanism of trauma, shows (50.0 %) of control group patients and (65.0 %) of intervention group suffer from anterior shoulder dislocation

Bio sociodemographic characteristics & clinical data	Control Group (n=20)		Intervention Group (n=20)		Significance test
	Number (N)	Percent (%)	Number (N)	Percent (%)	
Age Mean ± SD	33.36 ± 8.65		32.28± 8.84		T = 0.43 P= 0.66
Sex					
Male	11	55.0	12	60.0	χ^2 = 0 .082 P = 0.75
Female	9	45.0	8	40.0	
Educational Level					
Illiterate	3	15.0	0	0.0	
Read and Write	3	15.0	3	15.0	
Primary	0	0.0	5	25.0	FET = 4.25 P = 0.54
Preparatory	5	25.0	3	15.0	
Secondary	3	15.0	2	10.0	
University	6	30.0	7	35.0	
Occupation					
Professional	10	50.0	11	55.0	
Manual	4	20.0	3	15.0	FET = 3.12 P = 0.396
Housewife	5	25.0	6	30.0	
Retired	1	5.0	0	00.0	
Mechanism of trauma					
Anterior dislocation	10	50.0	13	65.0	χ^2 = 0.921 P = 0.523
Posterior dislocations	10	50.0	7	35.0	
Inferior dislocations	0	0.0	0	0.0	
Previous shoulder surgery					
Yes	1	5.0	0	0.0	χ^2 = 0.001 P = 1.001
No	19	95.0	20	100.0	
preoperative physiotherapy.					
Yes	0	5.0	0	0.0	χ^2 = 0.00 P = 1.00
No	20	95.0	20	100.0	
medical history					
No Associated disease	18	90.0	17	85.0	FET = 4.462 P = 0.335
DM	1	5.0	2	20.0	
Hypertension	1	5.0	1	5.0	

Table 2: Muscle testing for patients in two studied groups.

Dates	Muscle strength	control Group (n=20)		intervention Group (n=20)		Test	(P)
		N	%	N	%		
One month post-operative	holds against gravity eliminated	20	100	20	100	-	
Two months postoperative	holds against maximal resistance	8	40.0	16	80.0	$\chi^2 = 9.441$	(0.002) **
	holds against moderate resistance	8	40.0	2	10.0		
	holds against gravity eliminated	4	20.0	2	10.0		
	able to move full ROM	0	0.0	0	0.0		
	no visible movement	0	0.0	0	0.0		
	no palpable muscle contraction	0	0.0	0	0.0		
Three months postoperative	holds against maximal resistance	12	60.0	18	90.0	$\chi^2 = 40.25$	(0.000) **
	holds against moderate resistance	5	25.0	2	10.0		
	holds against gravity eliminated	3	15.0	0	00.0		

X^2: Chi-Square test *significant at P≤0. 05

Table 3: ROM of two groups post shoulder surgery

Dates	Control group Mean ± SD	Intervention Group Mean ± SD	T	(P)
One-month post-operative	179.68±0.80	179.64±1.03	-0.153	(0.87)
Two months postoperative	171.36 ± 10.82	156.88 ±8.59	-5.238	(0.00) **
three months postoperative	177.80± 3.31	157.56± 7.57	-12.242	(0.00) **

X^2: Chi-Square test *significant at P≤0. 05

Table (4): Assessment shoulder pain and disabilities during active activities during activities of patients in two studied group after three months postoperative of shoulder surgery.

Pain assessment		categories	Control group (n=20)		Intervention group (n=20)		Significance
			count	%	count	%	
Shoulder Pain		No pain	1	5.0	12	60.0	^{FE}P=0.000*
		Mild	5	25.0	8	60.0	
		Moderate	12	60.0	0	00.0	
		Sever	2	10.0	0	0.0	
shoulder pain during activities	**At its worst**	No pain	0	0.0	0	0.0	^{FE}P=0.001*
		Mild	3	15.0	15	75.0	
		Moderate	5	25.0	1	5.0	
		Sever	12	60.0	4	20.0	
	When lying on the involved side	No pain	0	0.0	1	5.0	^{FE}P=0.000*
		Mild	18	90.0	15	75.0	
		Moderate	2	10.0	4	20.0	
		Sever	0	0.0	0	00.0	
	Reaching for something on a high shelf	No pain	0	0.0	1	5.0	^{FE}P=0.000*
		Mild	1	5.0	16	80.0	
		Moderate	19	95.0	3	15.0	
		Sever	0	0.0	0	0.0	
	Touching the back of neck	No pain	1	5.0	7	35.0	^{FE}P=0.000*
		Mild	7	35.0	12	60.0	
		Moderate	12	60.0	1	5.0	
		Sever	0	0.0	0	0.0	
	Pushing with the involved arm	No pain	0	0.0	0	0.0	^{FE}P=0.00*
		Mild	2	10.0	18	90.0	
		Moderate	18	90.0	1	5.0	
		Sever	0	0.0	1	5.0	

Table (5): Total score of DASH score, 2nd months and 3rd month postoperative among two groups

Dates	Control group %	Study group %	(P)
First month postoperative	0.82	0.83	(0.592)
Two months postoperative	0.90	0.95	(0.002)
third months postoperative	0.92	0.98	(0.000)

Discussion

The most common displaced joint in the human body is the shoulder, particularly in young individuals. Treatment with nonsurgical standard care was inferior to shoulder stabilization surgery and postsurgical shoulder rehabilitation **(Coyle et al.,2022)**, Research on injury prevention and rehabilitation is important since inadequate care following a dislocated shoulder might result in subsequent joint instability **(Salamon, 2021)**. High rates of recurrent displacement, between 37% and 90%, have been shown in the absence of therapy. Preventing long-term instability of the shoulder joint is the aim of therapy following an acute shoulder dislocation **(lkhatib et al., 2022)**, so the aim of our study to evaluate the effect of rehabilitation program for shoulder dislocation post arthroscopy reconstruction on patient.

Concerning mechanism of trauma, the present study shows (50.0 %) of control group patients and (65.0 %) of intervention group suffer from anterior shoulder dislocation, these results in line with **(Kraus et al ,2020)**, who stated that the most frequent injury we sustain on a daily basis, particularly in young people, is anterior dislocation, **also** (**Coyle et al., 2022) reported that the** most frequent dislocation observed in accident and emergency rooms and trauma centers is traumatic anterior shoulder dislocations (TASD), which comprise 80% to 90% of all shoulder dislocations.

According to this study, there were statistically significant variations in muscular strength between the two subject groups**.** In this context **(Izquierdo et al, 2021)** concluded the exercises are thought of as a component of a rehabilitation program to address measurable physical inadequacies that are linked to pain and dysfunction. Therapeutic exercise is widely recommended to address mobility, muscle activation, strength, and strength dysfunctions. It is utilized in the treatment and management of a wide range of shoulder diseases. Also, reported the six weeks' physical rehabilitation program has improved the dislocation 'patients muscle power and muscle strength (**Meehan et al., 2020).**

In relation to shoulder ROM, this study showed that an improvement of shoulder ROM in the follow up periods for the intervention group whereas in the second and third postoperative months, the active exercise group and the self-exercise group differed statistically significantly in this regard, leading Ribeiro et al. (2019) to conclude that strengthening activities in addition to range of motion exercises increased shoulder flexion, abduction, and external rotation.

The results supported by **Yuan et al ,2021** who determined that following the training regimen for the damaged arms, shoulder range of motion had improved. Additionally, individuals with frozen shoulders experienced a significant improvement in their range of motion for shoulder flexion, abduction, internal rotation, and external rotation after completing a 4-week rehabilitation program.

The results of the current investigation showed that there was a statistically significant difference in the degree of pain after application of rehabilitation program for the intervention group during follow up periods. In this respect, a randomized controlled trial was done by **Holmgren et al., 2013** found that a 12-week exercise program significantly improved shoulder function and reduced pain in patients with proximal humeral fractures who had undergone surgery. The authors concluded that exercise therapy can be an effective treatment for improving shoulder function and reducing pain after surgery

These results disagreed with **(Rummel et al., 2021)** who studied " Shoulder function

improved shoulder function and reduced pain intensity and Based on these findings **Martinez-Catalan, (2023)** concluded that a shoulder exercise program is effective in improving shoulder function in patients with proximal humerus fractures who undergo surgical treatment

The current study's results on the impairments of the arm, shoulder, and hand demonstrated a statistically significant difference between the control and intervention groups in the second and third postoperative months, these results in line with **(Ramadan& amer, 2021)** who revealed that there were notable improvements for the study after surgery in regard to the arm's impairment and notable disparities between the study and control groups**.** These outcomes were also corroborated by those who described customized, progressive rehabilitation regimens meant to restore the shoulder's dynamic stabilizers' strength and normal range of motion. In this regard, **Thigpeetal (2016),** who reported that early exercise program participation after surgery appeared to have a good effect on shoulder range of motion, muscular strength, and increase functional capacity of arm, supports this result.

Despite the high frequency of shoulder dislocations to date the majority of evidence suggests that exercise therapy can be effective in improving shoulder function and reducing pain after arthrscopy and also improve outcomes .Generally exercise therapy can be a valuable component of rehabilitation after surgery, and healthcare providers should consider incorporating exercise therapy into their treatment plans for patients with these injuries

Conclusions

The results of the present study suggest that implementation of rehabilitation programs contribute to recovery of pain, disability, improve range of motion, and muscle strength of the shoulder following post arthroscopy reconstruction.

Recommendations

1- Rehabilitation program for patient with dislocation should be carried out immediately post arthroscopy reconstruction on individual basis to prevent shoulder dysfunction
2- All patients scheduled for arthroscopy reconstruction should have easy access to printed copies of the rehabilitation exercises in both the orthopedic department and clinic.
3- For the results to be more broadly applicable, the current study needs be repeated on bigger study populations.

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