

**EFFECTIVENESS OF SCAPULAR STABILIZATION EXERCISE
WITH CONVENTIONAL PHYSIOTHERAPY AMONG ADHESIVE
CAPSULITIS PATIENTS ATTENDED AT CENTER FOR THE
REHABILITATION OF THE PARALYSED (CRP)**

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“EFFECTIVENESS OF SCAPULAR STABILIZATION EXERCISE WITH CONVENTIONAL PHYSIOTHERAPY AMONG ADHESIVE CAPSULITIS PATIENTS ATTENDED AT CENTER FOR THE REHABILITATION OF THE PARALYSED “

Submitted by **Mushfiqa Tabassum**, for partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B. Sc. PT)



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DECLARATION

I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also decline that same any publication, presentation or dissemination of information of the study. I would bind to take written consent of my supervisor and Head of the Physiotherapy department, Bangladesh Health Professions Institute (BHPI)

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CONTENTS

Topic	Page No.
Acknowledgement	I
Acronyms	II
List of tables	III
List of figures	IV
Abstract	V
CHAPTER I: INTRODUCTION	
1.1 Background	1-2
1.2 Rationale	3
1.3 Aim	4
1.4 Study Objective	4
1.5 Alternative Hypothesis	5
1.6 Null Hypothesis	5
1.7 List of Variable	6
1.8 Operational Definition	7-8
CHAPTER II: LITERATURE REVIEW	9-18
CHAPTER III :METHODOLOGY	
3.1 Study design	19-20
3.2 Study Site	21
3.3 Study Area	21
3.4 Study Population and Sample Population	21
3.5 Sampling Technique	22
3.6 Inclusion criteria	23
3.7 Exclusion criteria	23
3.8 Treatment Regime	23-24
3.9 Sample Size	25
3.10 Method of data collection	25

3.11 Measurement tools	26
3.12 Data collection procedure	27
3.13 Data analysis	27
3.14 Ethical Considerations	32
CHAPTER IV : RESULTS	
4.1 Socio-Demographic Information	36-38
4.2 Result of Pain In Different Position	39-41
4.3 Result of ROM	42-47
4.4 Result of difficulty in Different Activities	48-51
CHAPTER V : DISCUSSION	52-54
CHAPTER VI : CONCLUSION AND RECOMMENDATIONS	55-56
REFERENCES	57-61
APPENDIX	66-96

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Acronyms

BHPI	Bangladesh Health Professions Institute
CRP	Centre for the Rehabilitation of the Paralysed
BMRC	Bangladesh Medical Research Council
CRP	Centre for the Rehabilitation of the Paralysed.
df	Degree of Freedom
IRB	Institutional Review Board
MS	Musculo-skeletal
MWM	Movement with Mobilization
NSAID's	Non-Steroidal Anti-inflammatory Drugs
PT	Physiotherapy
RCT	Randomized Control Trail
ROM	Range of Movement
TENS	Transcutaneous Electrical Nerve Stimulation
UST	Ultrasound Therapy
VAS	Visual Analogue Scale
NPRS	Numeric Pain Rating Scale
SPADI	Shoulder Pain and Disability Index
WHO	World Health Organization

List of Tables

Table No	Description	Page No
Table 1	Within Group Comparison through paired 't' test for variables	31
Table 2	Within Group Comparison through unpaired 't' test for variables	34
Table 3	Result of pain in different position	41
Table 4	Result of disability in different activities	46

List of Figures

Figure No	Description	Page No
Figure 1	Gender Distribution	37
Figure 2	Occupation of the Participants	38

Abstract

Purpose: The purpose of the study was to explore the effectiveness of scapular stabilization exercise with conventional physiotherapy compare to only conventional physiotherapy for Adhesive capsulitis patient. *Objectives:* To evaluate the effect of pain after introducing scapular stabilization exercise with conventional physiotherapy for Adhesive capsulitis. And to explore the socio-demography of the participants, to measure the scapular range of motion, to measure functional limitation. *Methodology:* Twenty patients with adhesive Capsulitis were randomly assigned into two groups. 10 patients to scapular stabilization exercise with conventional physiotherapy group and 10 patients to the only conventional physiotherapy group. Numeric Pain Rating Scale was used to measure pain intensity in different functional position and Goniometer to measure ROM. Unrelated “t” test and paired ‘t’ test were used to compare the result in ROM analysis and Pain and functional limitation was analyzed by Mann-Whitney U Calculator. *Results:* In this study, the results were found to be significant in case of variables of resting pain ($p<0.05$), pain during lying on affected side ($p<0.05$), pain during reaching object on a high shelf ($p<0.05$), pain during pushing with the involved arm ($p<0.05$). The within group and between group analysis also found significant improvement of ROM in case of scapular protraction ($p<0.05$), retraction ($p<0.05$), elevation ($p<0.05$). The functional limitation were also significant in case of combing hair ($p<0.05$), washing back ($p<0.05$), putting dress ($p<0.05$), carrying heavy weight ($p <0.05$) and difficulty during writing from between group analysis. *Conclusion:* This experimental study shows that scapular stabilization exercise with conventional physiotherapy were more effective than conventional physiotherapy alone for patients with Adhesive Capsulitis.

Key words: Adhesive Capsulitis, Scapular stabilization exercise, Conventional physiotherapy.

1.1 Background

Frozen shoulder syndrome, also known as adhesive capsulitis, is a clinical entity that refers to a stiff and painful shoulder causing major functional impairment (Hsu et al., 2011). These functional impairments limit everyday activities, especially ones which comprise overhead reaching activities. These impairments might range for a period of several months to several years, in addition to shoulder pain disturbing sleep at night on the affected side (Contractor et al., 2016). It has been estimated that this syndrome affects up to 5% of the general population, with peaked incidence rates occurring between the fifth and sixth decades. It affects women more than men, and is mostly associated with diabetes mellitus as a systemic condition (Shaheen et al., 2017). Frozen shoulder related dysfunction can affect individuals' function independently and consequently decrease the quality of life (Elhamed et al., 2018).

There are three clinical stages of adhesive capsulitis: - in stage I, lasting up to 3 months, patients suffer achy pain at rest and sharp pain at end ranges of motion with sleep disturbances. In stage II, referred to as the "painful" or "freezing" stage, lasts from 3 to 9 months in which pain causes substantial gradual loss of motion in all directions. In stage III, known as the "frozen" stage, includes pain and loss of motion from 9 to 15 months (Yuan et al., 2017).

The scapular position and motions on the thorax is a critical component of the normal gleno-humeral function and plays great roles in facilitating shoulder movements (Champion et al., 2009). In normal upper-quarter function, the scapula provides a stable base from which glenohumeral mobility occurs. Stability of the scapula depends on the surrounding musculature. These muscles must dynamically position the glenoid so that glenohumeral movement can occur. During all movements of the glenohumeral joint, it is important that the scapular-stabilizing musculature should be strong enough to properly

position the scapula. The main scapula stabilizers are the Levator Scapulae, Rhomboids major and minor, Serratus anterior, and Trapezii. When weakness or dysfunction is present in the scapular musculature, normal scapular positioning and mechanics may become altered which result in abnormal stresses to the capsular structures, rotator cuff compression and reduced performance (Paine et al., 2013).

Many treatments have been employed in the management of shoulder disorders. Non-steroidal anti-inflammatory drugs, local anaesthetic and corticosteroid injections into the glenohumeral joint, calcitonin and antidepressants, distension orthography, closed manipulation, physical therapy modalities and exercises are showed to be effective in management of shoulder disorders (Robinson et al., 2012).

Physical therapy is commonly prescribed for this condition. Rehabilitation programs consisting of exercise, massage, and modalities have been shown to reduce pain and improve shoulder ROM in all planes. Joint mobilization is a form of passive movement used to treat painful and stiff synovial joints. The optimal directions of force and movement application for the Joint mobilization techniques are assumed to induce various beneficial effects (Shrivastava et al., 2011).

Unfortunately, the scapular musculature is often neglected in the treatment of capsulitis. This lack of attention may often lead into the incomplete treatment. Therefore, reestablishment of normal shoulder function and restoring normal scapular muscle activation patterns by scapular stabilization based exercises, in our view, are the keys to a successful rehabilitation program.

1.2 Rationale

The aim of the study was to find out the effectiveness of scapular stabilization exercise of scapular muscles in Adhesive capsulitis. Literature shows that, Patients with frozen shoulder exhibit significant deficits in shoulder kinematics, including increased elevation and upward scapular rotation. Jewell and colleagues Pt (2000). Suggested in their meta-analysis of physical therapy interventions for frozen shoulder syndrome that joint mobilization and exercise were the most effective interventions. In the field of research in physiotherapy, hasn't encoded any research on effectiveness of stabilization exercise of scapular muscles in Adhesive capsulitis. There are some achievements in overall Physiotherapy intervention in Adhesive capsulitis but experts suggests that stabilization of scapular muscles is one of the important interventions for this condition.

The purpose of this study is to compare the effectiveness of stabilization exercise of scapular muscles with conventional physiotherapy and conventional physiotherapy alone for the patient with Adhesive capsulitis. There were some research articles published about physiotherapy intervention for patient with Adhesive capsulitis, but stabilization exercise of scapular muscles for Adhesive capsulitis is not so focused among them. So, in this study "Effectiveness of Scapular stabilization exercise in Combination with Conventional Physiotherapy for Adhesive Capsulitis" will give the evidence for effectiveness of effectiveness of stabilization exercise of scapular muscles in patient with Adhesive capsulitis. However, research helps to improve the knowledge of health professionals, as well as develops the profession. The results of the study may help to guide physiotherapists to give evidence based treatment in patient with Adhesive capsulitis, which will be beneficial for both the patient with Adhesive Capsulitis and for developing the field of physiotherapy profession.

1.3 Aim:

The aim of the study to compare the effectiveness of scapular stabilization exercise with conventional physiotherapy in patient with adhesive capsulitis.

1.4 Study Objectives

1.4.1 General Objective:

To identify the effectiveness of scapular stabilization exercise with conventional physiotherapy.

1.4.2 Specific Objectives:

- a) To explore socio-demographic characteristics of patients with Adhesive capsulitis.
- b) To evaluate severity of pain after introducing scapular stabilization exercise with conventional physiotherapy for patients with Adhesive capsulitis.
- c) To measure Improvement of Range of Movement (ROM) for patients with Adhesive capsulitis.
- d) To find out the activity limitation for patients with Adhesive capsulitis.

1.5 Null hypothesis

Scapular stabilization exercise with conventional physiotherapy is no more effective than conventional physiotherapy alone for the treatment of patient with Adhesive capsulitis.

$H_0: \mu_{\square} - \mu_{\square} = 0; \mu_{\square} = \mu_{\square}$ where the experimental group and control group initial and final mean difference is same.

Where,

H_0 = Null hypothesis

H_a = Alternative hypothesis

μ_{\square} = Mean difference in initial assessment

μ_{\square} = Mean difference in final assessment

1.6 Alternative Hypothesis

Scapular stabilization exercise with conventional physiotherapy is more effective than conventional physiotherapy alone for the treatment of patient with adhesive capsulitis.

$H_a: \mu_1 - \mu_2 \neq 0, \text{ or } \mu_1 \neq \mu_2$ where the and experimental group and control group initial final mean difference is not same.

1.7 List of variables

Independent variables

- Socio-demographic factor
- Scapular Protraction exercise
- Scapular Retraction exercise
- Scapular Elevation exercise
- Scapular Depression exercise

Dependent variables

- Adhesive Capsulitis

1.8 Operational Definition

1.8.1 Characteristics:

Characteristics of adhesive capsulitis mean pain, inactivity, muscle weakness and wasting, decrease range of motion, tenderness that means global restriction of shoulder movement.

1.8.2 Adhesive Capsulitis:

Adhesive capsulitis is a common, painful condition of the shoulder that is associated with loss of range of motion in the glenohumeral joint and more limitation of lateral rotation than abduction and medial rotation. It results from contraction of the glenohumeral joint capsule and adherence to the humeral head. The term shoulder capsulitis commonly used to describe adhesive capsulitis and other condition associated with loss of range of motion at the joint. Although shoulder capsulitis is often self-limited, it can persist for 2-3 years and may never fully resolve.

1.8.3 Conventional physiotherapy

Physiotherapeutic interventions that are widely accepted and commonly practiced by medical community. The researcher formulated a list of evidence based physiotherapy interventions of Adhesive Capsulitis and provided those to the physiotherapist to mark the interventions commonly used as conventional physiotherapy for Adhesive capsulitis. After finishing the pilot study, researcher became able to find out the conventional physiotherapy interventions used for Adhesive capsulitis and their frequency of use, with the consent of eight clinical physiotherapists. Capsular stretching, Accessory movements, pendulum exercise, pulley exercise, Infra-red radiation and Ultrasound were the most commonly used interventions, the frequency of use was 100%, Movement with mobilization and oral NSAID were the second most commonly used interventions and the frequency was 75-99% and corticosteroid injection were the partially used interventions and the frequency of use was 25- 49%.

1.8.4 Stretching and strengthening exercise of scapular muscles

Researcher developed a parameter of stabilization exercise of scapular muscles based on expert's opinion and some study programme for enhancing glenohumeral rhythm and joint mobility along with strengthen the muscles performing particular joint play.

Shoulder joint is multi-axial ball and socket type of synovial joint and have three degrees of freedom of movement (Datta, 2010). Here degree of freedom are three planes-coronal, sagittal and horizontal.

Shoulder joint maintains is static joint stability by the joint surfaces and the capsulolabral complex and dynamic stability by the rotator cuff muscles and scapular rotators (Lugo et al., 2008).

Adhesive Capsulitis (Shoulder capsulitis) is characterized by pain, stiffness and limited function of the glenohumeral joint in the shoulder range of motion in a capsular pattern, which adversely affects the entire upper extremity. Patients typically describe onset of shoulder pain followed by a loss of motion (Boyle et al., 2013). The capsular pattern in the shoulder is characterized by more limitation of lateral rotation and then abduction (Cyriax, 1982). The most common limitations in range of motion are lateral rotation, abduction (slightly flexion) and medial rotation.

Approximately 70% of Shoulder capsulitis patients are women, however males with shoulder capsulitis are at great risk for longer recovery and greater disability (Page & Labbe, 2010)

According to Kelley et al, 2009 Shoulder Capsulitis is a benign, self-limiting condition of unknown etiology characterized by painful and global limitation of glenohumeral range of motion of 25% in at least two directions most notably shoulder external rotation and abduction.

Shoulder capsulitis or frozen shoulder is a common source of shoulder pain. While frozen shoulder is commonly missed or confused with a rotator calf injury, it has a distinct pattern of symptoms resulting in sever shoulder pain, loss of shoulder function and ultimately stiffness. In basic terms, it means that shoulder pain and stiffness is a result of shoulder

capsule inflammation (capsulitis) and fibrotic adhesions that limit shoulder movement (Miller, 2012).

The actual cause of shoulder capsulitis is a matter of debate. So many studies show that it is a result of inflammation, scarring, thickening and shrinking of the capsule that surrounds the normal shoulder joint. Any injury can lead to a frozen shoulder (shoulder capsulitis) as a result of subsequent scar formation of shoulder capsule. Any injuries that can lead to a shoulder capsulitis include tendinitis, bursitis, and rotator cuff injury. On the other hand shoulder capsulitis occurs more frequently in patients with diabetes, chronic inflammatory arthritis of the shoulder or after chest or breast surgery. So from this study, long term immobility of the shoulder joint can put people at risk to develop shoulder capsulitis (William & Shiel, 2014)

The Pathophysiology of shoulder capsulitis is poorly understood. Pain associated with shoulder capsulitis can cause a limitation or selective immobilization of the painful shoulder. Prolonged immobilization of a joint has been shown to cause several detrimental pathophysiologic findings including: decreased collagen length, fibro fatty infiltration into the capsular recess, ligament atrophy resulting in decreased stress absorption, collagen band bridging across recesses, random collagen production, and altered sarcomere number in muscle tissue (Manske and Prohaska, 2008)

The Pathophysiology of adhesive capsulitis is poorly understood. Even the natural history of adhesive capsulitis (shoulder capsulitis) is still debated in the literature. Analysis of surgical specimens suggests that capsular hyperplasia and fibrosis have a role. The presence of cytokines suggests a possible autoimmune process, but the relationship is not well established (Rodeo et al, 2011)

Shoulder Capsulitis has been classified as primary or idiopathic and secondary capsulitis. Primary or idiopathic Shoulder Capsulitis is characterized by global capsular inflammation and fibrosis which occurs without any known precipitating cause. Primary shoulder capsulitis is usually a self-limited pathology which resolves

spontaneously by two to four years, but some Authors described functional limitations, persistent pain and weakness at long time follow-up.

Secondary Shoulder Capsulitis instead includes many conditions causing shoulder Stiffness, such as calcific tendinopathy (CT), rotator cuff tears (RCT), glenohumeral acromion-clavicular arthritis, diabetes, cerebrovascular accident or cardiovascular disease and previous shoulder trauma or surgery, which may prolong recovery and limit outcomes.

Three stages of frozen shoulder have been described in the literature: painful stage, stiffness or “frozen” stage, and recovery or “thawing” stage, with the average length of symptoms lasting 30 months. The average range of motion in frozen-stage shoulder patients is 98° of abduction, 117° of flexion, 33° external rotation and 18° of internal rotation with the shoulder abducted to 90°. While the “stiffness stage” is the longest of the stages, adhesive capsulitis is thought to be reversible in the acute pain stage. In addition to limited range of motion, shoulder complex muscle imbalances lead to altered shoulder motion. The upper trapezius tends to be more activated than the lower trapezius, creating an imbalance of the scapular stabilizers leading to increased elevation and upward rotation of the scapula during elevation of the glenohumeral joint in both the frontal and sagittal planes. Patients with adhesive capsulitis have higher EMG ratios of upper trapezius to lower trapezius during arm elevation when compared to asymptomatic subjects, indicating a muscular imbalance (Thomas et al., 2007).

The literature reports that adhesive capsulitis progresses through three overlapping clinical phases:

Acute/freezing/painful phase: gradual onset of shoulder pain at rest with sharp pain at extremes of motion, and pain at night with sleep interruption which may last anywhere from 3-9 months.

Adhesive/frozen/stiffening phase: Pain starts to subside, progressive loss of glenohumeral motion in capsular pattern. Pain is apparent only at extremes of movement. This phase may occur at around 4 months and last till about 12 months.

Resolution/thawing phase: Spontaneous, progressive improvement in functional range of motion which can last anywhere from 1 to 3.5 years (Wirth et al., 1997).

Patients with frozen shoulder exhibit significant deficits in shoulder kinematics, including increased elevation and upward scapular rotation. Eventually, patients with adhesive capsulitis develop the characteristic “shrug sign” during glenohumeral joint elevation, where the scapula migrates upward prior to 60 degrees of abduction. This indicates compensation due to lack of capsular extensibility as well as a change in the central nervous system motor patterning due to maladaptive movement (Page et al., 2010).

Patients with adhesive capsulitis may also develop adaptive postural deviations such as anterior shoulders or increased thoracic kyphosis as the function of the shoulder complex remains limited and painful. Adhesive capsulitis is generally related to a shortening and fibrosis of the joint capsule (ligaments) surrounding the shoulder joint. Nevasierwas among the first to report thickening and contraction of the shoulder capsule as well as inflammatory changes through histologic analysis (Kaplan et al., 2009).

The contracture of the shoulder ligaments actually decreases the volume of the capsule, thus limiting range of motion. It is likely that limitations in range of motion and the pain associated with frozen shoulder are not only related to capsular and ligamentous tightness, but also fascia restrictions, muscular tightness, and trigger points within the muscles. Physical therapists can address impairments and limitations associated each of these contributors to the pathology of adhesive capsulitis with a variety of treatment methods (Thomas et al., 2007)

Physical therapy interventions for frozen shoulder syndrome are joint mobilization and exercise. Physical therapy is the most effective interventions. Non-aggressive physical therapy interventions are generally more effective than aggressive or intensive interventions (Page et al., 2010).

Physical therapy interventions used with patients with frozen shoulder frequently include modalities, manual techniques, and therapeutic exercise. While some of these interventions have been studied in patients with adhesive capsulitis, it is important to remember that not all clinical interventions have evidence to support their use in specific patient populations. Recall that evidence-based practice is best defined as the use of the best evidence available along with clinical experience while taking into consideration the unique needs of an individual patient (Grove et al., 2012).

The rationale for using modalities in patients with adhesive capsulitis includes pain relief and affecting scar tissue (collagen). However, the use of modalities such as ultrasound, massage, iontophoresis, and phonophoresis has not been proven to be beneficial in treatment of patients with adhesive capsulitis (BAL et al., 2008). Interestingly, transcutaneous electrical stimulation (TENS) has been shown to significantly increase range of motion more than heat combined with exercise and manipulation. Research also suggests that low-power laser therapy is more effective than a placebo for treatment of patients with adhesive capsulitis. Recently, deep heating through diathermy combined with stretching was shown to be more effective than superficial heating for treating frozen shoulder patients (Leung et al., 2008).

Because adhesive capsulitis involves fibrotic changes to the capsuloligamentous structures, continuous passive motion or dynamic splinting are thought to help elongate collagen fibers. Continuous passive motion (CPM) was recently compared with conventional PT in 57 patients with adhesive capsulitis. Both groups improved after 4 weeks of treatment; while there was no significant difference between the groups, the CPM patients had greater reduction in pain levels. Dynamic splinting was also recently evaluated in patients with Stage 2 (“frozen stage”) adhesive capsulitis. The experts noted better outcomes when physical therapy was combined with the protocol, although there was no statistically significant difference between standard physical therapy or the Dynasplint alone. The concept of total end-range time (TERT) has also been described in the treatment of patients with adhesive capsulitis, suggesting maintenance of a stretch in the maximally lengthened range of motion for a total of 60 minutes per day (Page et al., 2010).

As stated previously, joint mobilization is an effective intervention for adhesive capsulitis. Several studies have demonstrated the effectiveness of joint mobilization in adhesive capsulitis patients. In particular, posterior glide mobilization was determined to be more effective than anterior glide for improving external rotation range of motion in patients with adhesive capsulitis (Johnson et al., 2007). Chang (2004), randomly assigned 20 consecutive adhesive capsulitis patients to physical therapy interventions including grade III stretch mobilization with distraction at end range of abduction and external rotation using either an anterior or posterior directed linear translation. After 3 sessions, the posterior mobilization group had significantly improved their external rotation range of motion by 31 degrees versus only 3 degrees in the anterior mobilization

group. In addition, high-grade joint mobilization techniques were more effective than low-grade mobilization in improving glenohumeral mobility and reducing disability in a recent randomized controlled trial of treatment of patients with adhesive capsulitis. (Kelley et al., 2009).

Myofascial trigger points, focal areas of increased tension within a muscle, may be present in the musculature around the shoulder complex in patients with adhesive capsulitis. In Travel and Simons' classic textbook, the authors describe how the subscapularis muscle in particular is referred to as the “Frozen Shoulder” muscle because trigger points in the subscapularis cause limitations in shoulder elevation and external rotation. The Spray and Stretch technique for the subscapularis and latissimusdorsi muscle may be effective at reducing trigger point irritation, pain, and helping to gradually lengthen tight muscles (Dommerholt et al., 2005).

Soft tissue mobilization and deep friction massage may benefit adhesive capsulitis patients. Deep friction massage using the Cyriax method was shown to be superior to superficial heat and diathermy in treatment of patients with adhesive capsulitis (McNeely et al., 2008).

Recently, instrument-assisted soft tissue mobilization (IASTM) as used in such interventions as Graston Technique, ASTYM, or guasha has become increasingly popular in physical therapy practice. IASTM reportedly provides strong afferent stimulation and reorganization of collagen, as well as an increase in microcirculation. The inferior glenohumeral capsule and pectoral fascia are often restricted, as well as the insertion of the latissimusdorsi and subscapularis. IASTM may help improve fibroblast proliferation and promote normal collagen alignment, although no studies have evaluated outcomes of the use of IASTM on patients with adhesive capsulitis.

Unstable shoulders can make an individual feel weak and put them at risk for painful injuries. When most people think of shoulder stability, they think of scapular retraction, pulling the shoulder blades back toward each other. This makes sense for most of us, this feels like a very stable and solid position. TRUE stability is setting the scapula in the most stable position for whatever shoulder position or movement is happening. (Moezy et al., 2014)

The scapular stabilization exercise are:

Retraction – To imagine scapular retraction, imagine a backwards motion of the scapula, moving closer towards the midline of the spine.

Protraction – In scapular protraction, the scapula moves toward the front plane of the body and away from the midline of the spine.

Elevation – In scapular elevation, your scapula moves up, or toward the head.

Probably the most commonly prescribed therapeutic exercises for adhesive capsulitis are active-assisted range of motion (AAROM) exercises. These typically involve the patient using the uninvolved arm, or using equipment such as rope-and-pulley, wand/T-bar, or exercise balls. Generally, these exercises are performed for flexion, abduction and external rotation ranges of motion which are frequently the most limited (Kazemi, 2000).

Griggs and colleagues found that physical therapy including 4 self-stretches (passive flexion, horizontal adduction, internal rotation behind the back with the unaffected arm, and external rotation at 0° using a cane) performed at least twice a day produced

a satisfactory outcome in 90 percent of stage 2 adhesive capsulitis patients. These patients significantly improved in pain, range of motion, and shoulder function; however, the study did not compare the intervention to other types of treatment. Despite this limitation, the authors suggested that more aggressive treatments such as manipulation are rarely necessary (Ludewig & Braman, 2011).

Resistive exercises typically include strengthening of the scapular stabilizers and rotator cuff, when range of motion has progressed enough for strengthening to be an appropriate intervention. Muscles prone to weakness in a variety of shoulder dysfunctions include the lower trapezius, serratus anterior, and infraspinatus. Patients with adhesive capsulitis have significantly weaker lower trapezius muscles compared to asymptomatic controls. It is important that treating therapists facilitate normal movement patterns rather than allowing pathological adaptive patterns to prevail during movement for the sake of completing an exercise (Page et al., 2010).

Non-operative treatment may also include injections directly into the glenohumeral joint. These injections often contain both a corticosteroid and an anesthetic, and can also include saline to distend the capsule, stretching the fibers. When saline is used to distend the capsule, it is known as “distension arthrography” or “hydroplasty”. Corticosteroid injections have been shown to be as effective as exercise for treating frozen shoulder, particularly when provided in the early stages of the pathology (Manske & Prohaska, 2010).

In their systematic review, Blanchard et al. suggested that corticosteroid injections have a greater effect when compared to physical therapy when utilized within the first 6 weeks of treatment, although these differences diminished over time. They noted a moderate effect of corticosteroid injections on pain, external rotation ROM, and disability at 6 weeks, and only small effects after 12 weeks (Trampas & Kitsios, 2006).

Distension arthrography is often successfully combined with physical therapy. In fact, therapeutic exercise, including physical therapy, is more effective when combined with a corticosteroid injection (Lin et al., 2009).

Adhesive capsulitis patients not responding to physical therapy are often treated with manipulation under anesthesia (MUA), where the shoulder is forcefully moved by the physician into the full ranges of motion, breaking the adhesions located within of the shoulder capsule. In addition to increased risk of complications from anesthesia, MUA can cause severe damage including labral tears, tendon tears, fractures, and ruptures of the shoulder ligaments. Most recently, steroid injections with distention arthrography have been shown to be as effective as MUA and are therefore the recommended course of treatment because of the risks associated with MUA (Dodenhoff et al., 2000).

3.1 Study Design

The study was designed using an experimental design quantitative research. According to DePoy & Gitlin (2013) the design could be shown by:

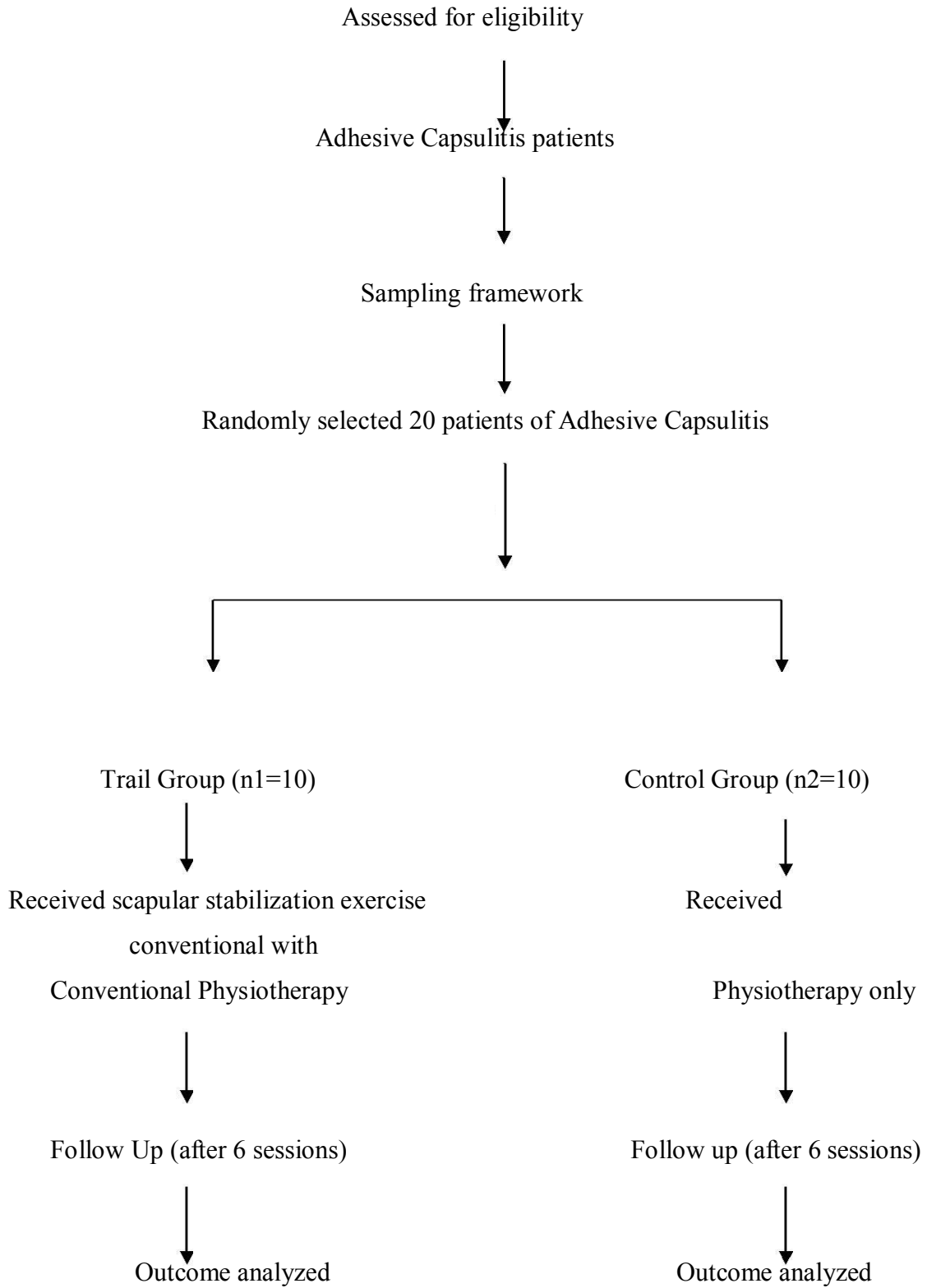
Experimental group: r O_1 X_1 O_2

Control group: r O_3 X_2 O_4

The study was an experimental between two subject designs. Conventional physiotherapy with scapular stabilization exercise was applied to the experimental group and Conventional physiotherapy only will be applied to the control group.

A pre-test (before intervention) and post-test (after intervention) was administered with each subject of both groups to compare the pain effects and ROM before and after the treatment.

Flowchart of the phases of randomized controlled trial



Outcome analyzed Outcome analyzed A flowchart for a randomized controlled trial of a treatment program including conventional physiotherapy with scapular stabilization exercise for patient Adhesive Capsulitis.

3.2 Study Site

The study was conducted at Musculoskeletal Unit, Department of Physiotherapy, CRP, Savar, Dhaka- 1343.

3.3 Study Area

The researcher was a 4th year B.Sc in Physiotherapy student of Bangladesh Health Professions Institute (BHPI) and the research was conducted as part of the course curriculum. For this reason the researcher had to collect data within short time to maintain the contrasts of the course module time. The study was conducted in Musculoskeletal unit of Center for the Rehabilitation of the Paralysed (CRP). It is a nongovernment organization working for the development of health care delivery system of Bangladesh through providing Physiotherapy, Occupational therapy, Speech and Language therapy services in indoor and outdoor programs. Musculoskeletal unit provides service for patient with different types of musculoskeletal problem.

3.4 Study Population and Sample Population

A population was the total group or set of events or totality of the observation on which a research is carried out. It was the group of interest to the researcher, the group whom the researcher would like to generalize the result of the study. About 20 samples were selected for this study.

3.5 Sampling Technique

Subjects, who met the inclusion criteria, were taken as sample in this study. Twenty patients with Adhesive capsulitis were selected from outdoor musculoskeletal physiotherapy department of CRP (Savar) and then 10 patients with Adhesive Capsulitis were randomly assigned to scapular stabilization exercise with conventional physiotherapy group and 10 patients to the only conventional physiotherapy group for this simple randomize control trial study. When the samples were collected, the researcher randomly assigned the participants into experimental and control group, because it improves internal validity of experimental research. The samples were given numerical number C1, C2, C3 etc for the control and E1, E2, E3 etc for experimental group. Total 20 samples included in this study, among them 10 patients were selected for the experimental group (received scapular stabilization exercise with conventional physiotherapy) and rest 10 patients were selected for control group (conventional physiotherapy only).

3.5.1 Randomization

After the completion of sample collection, the researcher had randomly assigned the participants into experimental and control group, because it improves internal validity of experimental research. The samples was given numerical number C1, C2, C3 etc. for the control group and E1, E2, E3 etc. for experimental group. Total 20 samples were included in this study, among them 10 patients were selected for the experimental group (scapular stabilization exercise along with conventional physiotherapy techniques) and rest 10 patients were selected for control group (received only the conventional physiotherapy techniques).

3.6 Inclusion Criteria

- Age range- 30 to 70 years.
- Both male and female were included.
- The participations were those individual who have been diagnosed adhesive capsulitis by qualified physiotherapist.
- Subject who having decrease shoulder function.
- Included those who showed willingness to participants.

(Arshad, et al., 2015) & (Plummer et al., 2017)

3.7 Exclusion Criteria

- Other condition involving shoulder such as rheumatoid arthritis, osteoarthritis, osteoporosis or malignancy
- Below the ages of 30 and above 65 years.
- Those who will no fulfill the criteria will be excluded.
- Any red flag of musculoskeletal complain.
- Surgery to the shoulder.

3.8 Treatment Regime

Experimental Group

- a. Conventional Physiotherapy Techniques
- b. Scapular stabilization exercises.
 - Scapular protraction exercise
 - Scapular retraction exercise
 - Scapular elevation exercise
 - Scapular depression exercise
 - Physioball scapular exercise

Control Group

Conventional Physiotherapy Techniques

A common intervention program was executed for both groups as conventional physiotherapy, it includes- .

- Capsular stretching
- Accessory movements
- Soft tissue mobilization
- Pendulum exercise
- Pulley exercise
- Infra-red radiation
- Ultrasound

Which were the most frequently, used interventions. In this study, the experimental group was treated with scapular stabilization exercise with conventional physiotherapy. Clinical physiotherapist applied the scapular stabilization exercise and the conventional physiotherapies. Each group got 6 sessions of treatment, because in practice expert opinion suggests that 6 sessions is minimal enough for patients with adhesive Capsulitis to get more effectiveness.

3.8 Sample Size

20 Participants with adhesive capsulitis were selected due to limited time. The study had its own limitation constructed by limited time scale and as a result by the sample size.

3.9 Method of data collection Data

Collection Tools

Data were collected by using a standard questionnaire. In that time some other necessary materials were needed like pen, pencil, and white paper, clip board & note book. Data were analyzed with the software named Statistical Packages for the Social Science (SPSS) version 20.0. Data were presented by using table.

Questionnaire

The questionnaire was developed under the advice and permission of the supervisor following certain guidelines. There were nine close ended questions with numeric pain rating scale (NPRS), 10 close ended question with functional disability and with some objective questions which were measured by examiner and each question was formulated to find out the change of pain with each activity.

Social demographic criteria included age, gender, occupation, marital status etc. Positional criteria included resting pain, pain during abduction, pain during lateral rotation, pain during medial rotation, pain during sleep etc. Estimate functional disability included combing hair, washing back, putting on dress, carrying heavy object, household work etc. Movement criteria included passive flexion, extension, abduction, adduction passive lateral rotation, and passive medial rotation.

3.9 Measurement tools

3.11.1 Numeric pain rating scale

In this study researcher used numeric pain rating scale for measuring the intensity of pain. The NPRS is a segmented numeric version of the visual analog scale (VAS) in which a respondent selects a whole number (0–10 integers) that best reflects the intensity of pain. The common format is a horizontal bar or line. Similar to the VAS, the NPRS is anchored by terms describing pain severity extremes. Scores range from 0 -10 points, with higher scores indicating greater pain intensity. The 11-point numeric scale ranges from '0' representing one pain extreme (e.g. “no pain”) to '10' representing the other pain extreme (e.g. “pain as bad as you can imagine” or “worst pain imaginable”)

3.11.2 Goniometer

In this study researcher used Goniometer for measuring the Range of Movement (ROM) of shoulder Abduction, Lateral rotation and Medial rotation. The Goniometer is a simple and accurate way of objective assessment of ROM.

3.11.3 Shoulder pain and disability index

The Shoulder Pain and Disability Index (SPADI) was a self-administered questionnaire that consists of two dimensions, one for pain and the other for functional activities. The pain dimension consists of few questions regarding the severity of an individual's pain. Functional activities were assessed with eight questions designed to measure the degree of difficulty an individual has with various activities of daily living. The SPADI takes 5 to 10 minutes for a patient to complete and is the only reliable and valid region-specific measure for the shoulder.

3.12 Data collection procedure

The study procedure was conducted through assessing the patient, initial recording, treatment and final recording. After screening the patient at department, the patients were assessed by qualified physiotherapist. Six sessions of treatment was provided for every subject. Twenty subjects were chosen for data collection according to the inclusion criteria. The researcher divide all participants into two groups and coded C1, C2, C3... (10) For control group and E1, E2, E3... (10) For experimental group. Experimental group received conventional physiotherapy with scapular stabilization exercise and control group received only conventional physiotherapy.

Data was gathered through a pre-test, intervention and post-test and the data was collected by using a written questionnaire form which was formatted by the researcher. Pretest was performed before beginning the treatment and the intensity of pain and ROM of shoulder movements were noted with NPRS score and degrees on questionnaire form. The same procedure was performed to take post-test at the end of six session of treatment. Researcher gave the assessment form to each subject before starting treatment and after six session of treatment and instructed to put mark on the line of NPRS according to their intensity of pain. The researcher collected the data both in experimental and control group in front of the qualified physiotherapist in order to reduce the biasness. At the end of the study, specific test was performed for statistical analysis.

3.13 Data analysis

Statistical analysis was performed by using Microsoft Office Excel 2013 and scientific calculator. Data was analyzed by using SPSS version 20.00 to compute the descriptive statistics using pie chart and also percentage were conducted using unrelated t-test.

The researcher had calculated the variables mean, mean difference, standard deviations, standard error, degree of freedom and significant level. In the between group, the data shows that the mean difference was greater than the control group. The researcher had tested mean variables stating problem to test using unrelated t-test.

3.13.1 Statistical Test

In order to ensure the research had some values, the meaning of collected data has to be presented in ways that other research workers can understand. Statistical analysis had performed by using SPSS 20, Microsoft Excel 2013 and scientific calculator. To find out the 'p' value for the significance of the result, the examiner used an unrelated t-test. Dependent variables of the treatment group were statistically tested by unrelated t-test and eventually give a 'p' value. In this study, using a same subject group, where conveniently allocated to the treatment program group. The same subjects were used for each level of the independent variable. As the subjects were the same for all levels of the independent variables, they were their own controls. Outcomes were measured by collecting the scores of different variables and the scores are considered of interval data. The common methods of analyzing data from pretest-posttest research design were unrelated t-test on the difference score between two group post -test. If the variables were quantitative, the mean of each group are calculated. The application of statistical inference test may or may not be required. Unrelated t-test was a common device used to find out the differences between means and related t-test used to find out the differences within means. For this reason, the study used parametric unrelated t-test and related t-test to calculate the significance level of the study. The unrelated t-test was used to find out whether the unrelated t-test value represented a significance differences between the results from before received treatment & after received treatment of the same group of subjects.

The examiner used U-test calculator for calculating post test results of experimental group and control group.

Mann–Whitney U test

This test can be used to determine whether two independent samples were selected from populations having the same distribution.

Assumption

- Different and independent variables
- Variables were quantitative
- The normal distributions are not equal.

Formula: Test statistic U is follows

$$U = R - \frac{n(n+1)}{2}$$

Where,

n= is the sample size

R= the sum of the ranks

Paired T test

Paired t test was used to compare difference between means of paired variables. Selection of test of hypothesis is mean difference under t distribution.

Assumption

- Paired variables
- Variables were quantitative
- Parent population of sample observation follows normal distribution

Formula: Test statistic t is follows

$$t = \frac{\bar{d}}{SE(d)} = \frac{SD}{\sqrt{n}}$$

Where,

\bar{d} = mean of difference (d) between paired values

SE (d) = Standard Error of the mean difference

SD= standard deviation of the difference d

n = number of paired observation calculation of paired t value of the pain at rest as below

$$t = \frac{\bar{d}}{SE(d)} = \frac{SD}{\sqrt{n}} = \frac{5.750}{\frac{0.547}{\sqrt{10}}} = \frac{5.750}{0.172} = 8.567$$

Within Group Comparison through 't' test for variables at the following level of significance

Table 1: In this way researcher had calculated all the observed ‘t’ values and had presented in the following tables

		Experimental group		Control group		
Variables	Observed “t” value	Observed “P” value	Significant/Not Significant	Observed “t” value	Observed “P” value	Significant/Not Significant
Scapular Protraction	8.57	.001	Significant	9	.001	Significant
Scapular Retraction	29	.001	Significant	11	.001	Significant
Scapular Elevation	19.9	.001	Significant	19	.001	Significant

Unpaired t-test

Unpaired t-test was used to compare difference between two means of independent variables. Selection of test of hypothesis was two independent mean differences under independent t distribution.

Assumption:

- Different and independent variables
- Variables are quantitative
- Normal distribution of the variables

Formula: test statistic t is follows:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{S \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

Where,

\bar{x}_1 = Mean of the Experimental Group,

\bar{x}_2 = Mean of the Control Group,

n_1 = Number of participants in the Experimental Group,

n_2 = Number of participants in the Control Group

S = Combined standard deviation of both groups

Where,

$$S = \sqrt{\frac{\sum(\bar{x}_e - x_1) + (\bar{x}_c - x_2)}{n_1 + n_2 - 2}}$$

Here,

\bar{x}_e = Mean of experimental group

\bar{x}_c = Mean of control group

x_1 = Individual value of experimental group

x_2 = Individual value of control group

n_1 = Number of participants in the Experimental Group

n_2 = Number of participants in the Control Group.

Table-2: In this way researcher had calculated all the observed ‘t’ values and had presented in the following tables-

No.	Variables	Observed “t” value	df	Significance Level
01	Scapular protraction	3.674	18	0.002
02	Scapular retraction	6.656	18	0.001
03	Scapular elevation	5.941	18	0.001

3.13.2 Level of Significance

In order to find out the significance of the study, the “p” value was calculated. The ‘values’ refers to the probability of the results for experimental study. The word probability refers to the accuracy of the findings. A ‘p’ value is called level of significance for an experiment and a ‘p’ value of ≤ 0.05 was accepted as significant result for health service research. If the ‘p’ value is equal or smaller than the significant level, the results are said to be significant.

3.14 Ethical Considerations

The proposal of the dissertation including methodology was presented to the Institutional Review Board (IRB) of BHPI and obtained permission from the IRB authority of ethical committee of Bangladesh Health Professions Institute (BHPI). And the whole process of this research project was done by following the Bangladesh Medical Research Council (BMRC) guidelines and World Health Organization (WHO) Research guidelines. Again before the beginning of the data collection, researcher has obtained the permission from the concerned authorities ensuring the safety of the participants. The researcher strictly maintained the confidentiality regarding participant’s condition and treatments.

20 patients were enrolled in the study. Among them, 10 in the scapular stabilization exercise with conventional treatment group (experimental group) and 10 in the only conventional treatment group (control group). The whole subject of both experimental and control group scored their pain intensity, functional limitation and scapular ROM before and after completing 6 session of treatment.

4.1 Socio-Demographic Information

4.1.1 Age of the participant

Among the 20 participants the mean age of participant in control group was 50.6 years and whereas experimental group mean age was 51.7 years on average.

4.1.2 Gender of Participants

20 Patients with adhesive Capsulitis were included as sample of the study, among them almost 60% are male and 40% are female.

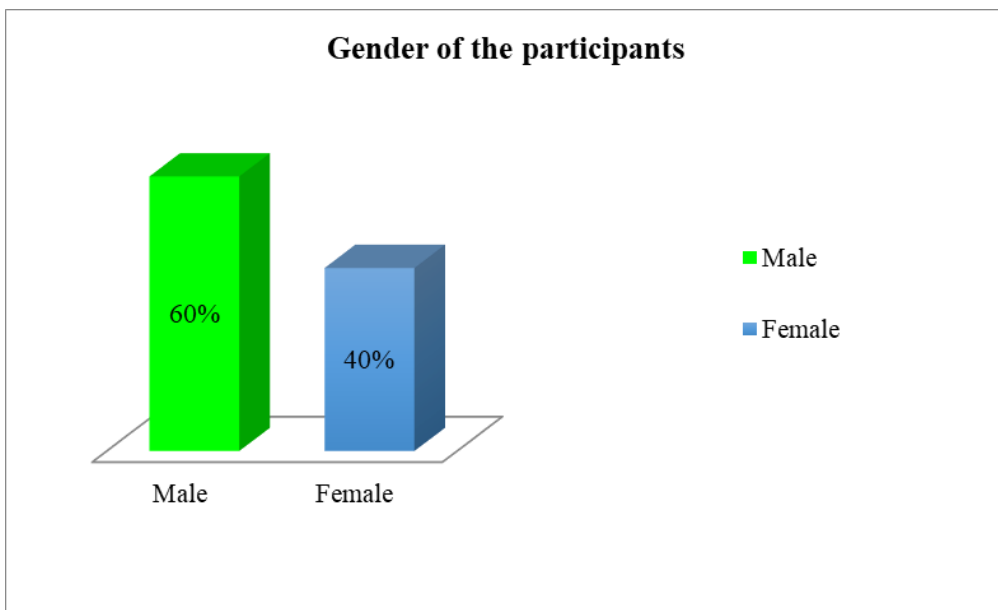


Figure - 1- Gender Distribution

4.1.3 Occupation of the participants

20 Patients with adhesive Capsulitis were included as sample of the study, among them almost 10% were service holder, 10% were businessman, 40% were house wife, 15% were farmer, 15% were retired and others 10%.

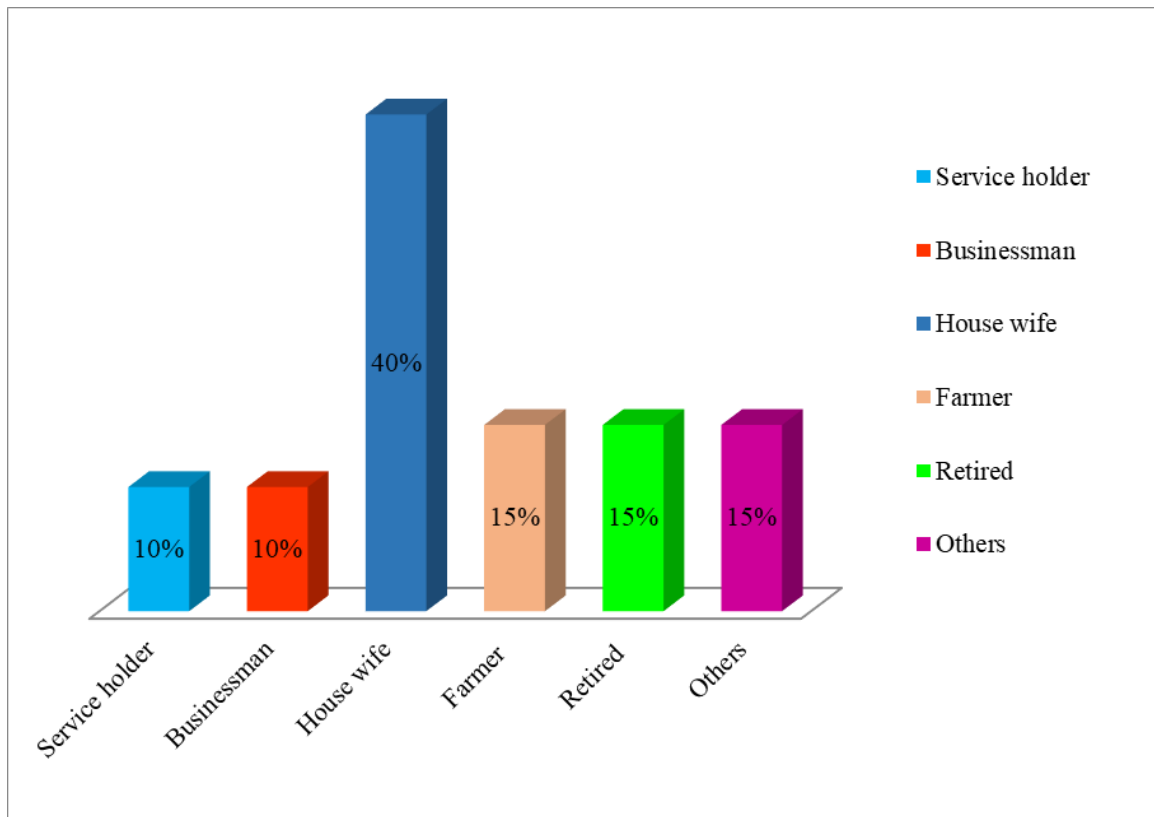


Figure - 2- Occupation of the participant

4.2 Results of pain of the participant

There was significant difference in pain between the two groups at baseline and post test score. Pre (baseline) and post treatment inter group comparison was done using Mann Whitney U test.

Pre-test and post test scores of all pain had been put on MS excel and find out the differences and again put it to SPSS 20 and get the result of Mann Whitney U test whether pain in different position were significant or not significant. All the pain related variables were analyzed between and within group. Between group analyses were calculated using the Mann Whitney U test. As there was two different group of subjects and all the dependent variables are ordinal.

Pre and post-test of pain at rest, pain during lying on affected side, during abduction and pushing with involved arm after 6 sessions of treatment. Significance was accepted at <0.05 level of probability.

In between 20 patients, 10 patients were in control group and 10 patients were in experimental group. Using “U” test on the data of pain in different position, it found that the ‘p’ value and the result was found to be significant. So this result suggests that following component for experimental group showed significant improvement in case of different positioning.

Table - 3: Between Group Comparison of pain after 6 sessions of treatment

Parameter	Mann-Whitney U test	P- value	Significant
Severity of the pain	3.00	.001	Significant
Pain in resting position	.000	.001	Significant
Pain during abduction	2.00	.001	Significant
Pain during lying affected side	2.00	.001	Significant
Pain during placing object on high	1.50	.001	Significant
Pain during pushing with involved arm	7.50	.001	Significant
Pain during placing hand on neck	5.00	.001	Significant

4.3 Results of ROM in different movement

ROM in Scapular Protraction

The study found that in the range of motion in scapular protraction observed t value was 8.58 in experimental group at paired t test while this same variable for control group observed value was 9.00 in within group. 5% level of significant at 9(nine) degree of freedom standard t value was 2.262 and observed t value in ROM in scapular protraction in both group which was greater than standard t value that mean null hypothesis was rejected and alternative hypothesis was accepted in the within group. Both groups in aspect of ROM in scapular protraction were significant at 0.00% level.

The unrelated or independent t test in between group at 5% level of significant and 18 degree of freedom standard table value was 2.10 and at the same significant level and same degree of freedom observed t value was 3.674. The observed t value was greater than the table value that mean null hypothesis was rejected and alternative hypothesis was accepted which mean scapular stabilization exercise with conventional physiotherapy treatment group was more benefited than conventional physiotherapy group alone.

ROM in Scapular Retraction

The study found that in the range of motion in scapular retraction observed t value was 29.00 in experimental group at paired t test while this same variable for control group observed value was 11.00 in within group. 5% level of significant at 9(nine) degree of freedom standard t value was 2.262 and observed t value in ROM in scapular retraction in both group which was greater than standard t value that mean null hypothesis was rejected and alternative hypothesis was accepted in the within group. Both groups in aspect of ROM in scapular retraction were significant at 0.00% level.

The unrelated or independent t test in between group at 5% level of significant and 18 degree of freedom standard table value was 2.10 and at the same significant level and same degree of freedom observed t value was 6.656. The observed t value was greater than the table value that mean null hypothesis was rejected and alternative hypothesis was accepted which mean scapular stabilization exercise with conventional physiotherapy treatment group was more benefited than conventional physiotherapy group alone.

ROM in Scapular Elevation

The study found that in the range of motion in scapular elevation observed t value was 19.90 in experimental group at paired t test while this same variable for control group observed value was 19.00 in within group. 5% level of significant at 9(nine) degree of freedom standard t value was 2.262 and observed t value in ROM in scapular elevation in both group which was greater than standard t value that mean null hypothesis was rejected and alternative hypothesis was accepted in the within group. Both groups in aspect of ROM in scapular elevation were significant at 0.00% level.

The unrelated or independent t test in between group at 5% level of significant and 18 degree of freedom standard table value was 2.10 and at the same significant level and same degree of freedom observed t value was 5.941. The observed t value was greater than the table value that mean null hypothesis was rejected and alternative hypothesis was accepted which mean scapular stabilization exercise with conventional physiotherapy treatment group was more benefited than conventional physiotherapy group alone.

4.4 Results of disability of the participants

There was significant difference in disability between the two groups at baseline and post test score. Pre (baseline) and post treatment inter group comparison was done using Mann Whitney U test.

Pre-test and post test scores of all pain had been put on MS excel and find out the differences and again put it to SPSS 20 and get the result of Mann Whitney U test whether functional limitation or disability in different position were significant or not significant. All the pain related variables were analyzed between and within group. Between group analyses were calculated using the Mann Whitney U test. As there was two different group of subjects and all the dependent variables are ordinal.

Pre and post-test of difficulty in wash hair, wash back, carrying heavy object and writing with involved hand after 6 sessions of treatment. Significance was accepted at <0.05 level of probability.

Using “U” test on the data of disability during different work, researcher found that the ‘p’ value and the result was found to be significant. So this result suggests that following component for experimental group showed significant improvement in case of disability in different work as washing hair, washing back, writing with the affected hand and carrying heavy object.

Table - 4– Result of disability among the Participants

Parameter	Mann-Whitney U test	P- value	Significant
Difficulty in combing hair	.50	.001	Significant
Difficulty in washing back	5.00	.002	Significant
Difficulty in putting shirt	2.00	.001	Significant
Difficulty in writing	14.50	.006	Significant
Difficulty in carrying heavy object	2.50	.001	Significant

The purpose of the study was to evaluate the effectiveness of scapular stabilization exercises with conventional physiotherapy compare to only conventional physiotherapy for Adhesive capsulitis. The study based on data gathered from frozen shoulder patients who came to CRP for receive treatment.

The experimental design employed in this study is mainly suitable for a comprehensive investigation of the management of participating subjects (Kumar, 2010). This was experimental type of survey on 20 participants who were complained of frozen shoulder. The study found that mean age of the experimental participant was 51 years and control group participant was 50 and most of the participants were above 45 years. The youngest participants in this study were 30 years old and oldest participants were 70 years old. In a Malaysian study performed by (Zakaria, et al., 2009) found that the mean age was 65.6 ± 10.8 years of frozen shoulder. Another result has been reported by Chacon, et al. (2004) who concluded that the mean age was 64 ± 9 and their age range was 41-86 years. So above two studies, mean age was not similar to this study. So, this indicated that frozen shoulder had affected the participants in this study earlier than others study. In this study, female participants were 40% and male participants were 60%. Frozen shoulder usually affects patients aged 30-70, with females affected more than males, and no predilection for race (Arshad, et al., 2015).

The analysis of significance was carried out by using unrelated *U test* to compare the effectiveness scapular stabilization exercise with conventional physiotherapy compare to only conventional physiotherapy for Adhesive capsulitis. By using a *U test* on the data the results were found to be significant in case of resting pain ($p < 0.05$), pain during carrying heavy object ($p < 0.05$), pain pushing with the affected arm ($p < 0.05$), pain during placing object on a high shelf ($p < 0.05$), pain during sleeping in affected side ($p < 0.05$).

Researcher also found significant Improvement of ROM in case of protraction, retraction and elevation ($p < .05$). A quasi experimental study showed that among the 100 participants, control group was received conventional physiotherapy and experimental group was received movement with mobilization for 2 months to improve range of motion that result concluded that in trail group, significant Improvement of ROM in case of Abduction ($p < .05$) and Medial rotation ($p < .05$) but improvement of lateral rotation was same in control group (Arshad et al., 2015).

Shrivastava et al. (2011) showed that his study, statistically significant in movement with mobilization group and conventional physiotherapy group separately. The Mean percentage improved of pain for conventional physiotherapy with MWM group from 5.85% to 3.6% in two weeks and p value < 0.05 . This study also found significant Improvement of ROM in case of Abduction ($p < .05$), lateral rotation ($p < .05$), and not statistically significant Medial rotation ($p < .05$).

In 2003, an evaluation of a therapeutic exercise program was held intended to reduce pain and improve shoulder function. Sixty seven male symptomatic worker (mean age 49) were randomized into a treatment intervention group ($n=34$) and a control group ($n=33$); asymptomatic subject ($n=25$) participated as an additional control group. Subjects in the intervention group were instructed in a standardized eight week home exercise program of five shoulder stretching and strengthening exercise. Subjects in the control groups received no intervention. Subjects returned after 8-121 weeks for follow up testing. Results suggest a home exercise program can be effective in reducing symptoms and improving function in construction workers with shoulder pain. Intervention subjects also reported significantly greater reduction in pain and disability than controls (Ludewig & Borstad., 2013)

The main limitation of this study was its short duration. The study was conducted with 20 patients of Adhesive Capsulitis, which was a very small number of samples in both groups and was not sufficient enough for the study to generalize the wider population of this condition. It is limited by the fact daily activities of the subject were not monitored which could have influenced. Researcher only explored the effect of Scapular stabilization exercise after 6 sessions, so the long term effect of scapular stabilization exercise was not explored in this study. There was no available research done in this area in Bangladesh. So, relevant information about Adhesive Capsulitis patient with specific intervention for Bangladesh was very limited in this study.

6.1 Conclusion

The result of this experimental study have find out the effectiveness of conventional physiotherapy with scapular stabilization exercise are better treatment than the conventional physiotherapy alone for reducing pain and disability and increase ROM in Adhesive Capsulitis patient.

In this study, twenty patients with adhesive Capsulitis were randomly assigned into two groups. 10 patients to scapular stabilization exercise with conventional physiotherapy group and 10 patients to the only conventional physiotherapy group. Numeric Pain Rating Scale was used to measure pain intensity in different functional position and Goniometer to measure ROM. Unrelated “t” test and paired ‘t’ test was used to compare the result in ROM analysis and Pain and functional limitation was analyzed by Mann-Whitney U Calculator.

The results were found to be significant in case of variables of resting pain ($p < 0.05$), pain during lying on affected side ($p < 0.05$), pain during reaching something on a high shelf ($p < 0.05$), pain during pushing with the involved arm ($p < 0.05$) and the functional limitation were also significant in case of washing hair ($p < 0.05$), washing back ($p < 0.05$), putting dress ($p < 0.05$), carrying heavy weight ($p < 0.05$), writing with the affected hand from between group analysis .The within group and between group analysis were also found significant improvement of ROM in case of scapular protraction ($p < 0.05$), retraction ($p < 0.05$), elevation ($p < 0.05$)

In this study, participants in the conventional physiotherapy with scapular stabilization group showed a greater benefit than those in the only conventional physiotherapy group, which indicate that the conventional physiotherapy with scapular stabilization can be an effective therapeutic approach for patient with Adhesive capsulitis.

From this research the researcher wishes to explore the effectiveness of scapular stabilization exercise along with conventional physiotherapy to reduce the features of patient with Adhesive capsulitis, which will be helpful to facilitate their rehabilitation and to enhance functional activities.

6.2 Recommendation

As a consequence of this research it is recommended to do further study including comparison of the conventional physiotherapy and scapular stabilization exercise with conventional physiotherapy alone to assess the effectiveness of these interventions with Double blinding procedure.

It is recommended to do further study with more number of subjects and with a longer time frame.

It is also recommended to include the functional outcome and strength of patient and to identify the average number of sessions that are needed to be discharged from treatment to validate the treatment technique.

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APPENDIX



বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই) Bangladesh Health Professions Institute (BHPI)

Ref.

CRP-BHPI/IRB/10/18/1250

Date: 22/10/2018

To
Mushfiqia Tabassum
B.Sc. in Physiotherapy
Session: 2013-2014, Student ID:112130197
BHPI, CRP, Savar, Dhaka-1343, Bangladesh.

Subject: Approval of the thesis proposal “Effectiveness of scapular stabilization exercise with conventional physiotherapy among adhesive capsulitis patients attended at center for the rehabilitation of the paralyzed” by ethics committee.

Dear Mushfiqia Tabassum,
Congratulations,

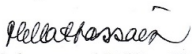
The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above mentioned dissertation, with yourself, as the Principal investigator. The following documents have been reviewed and approved:

Sr. No.	Name of the Documents
1	Dissertation Proposal
2	Questionnaire (English version & Bangla version)
3	Information sheet & consent form.

The purpose of study is to determine the Effectiveness of scapular stabilization exercise for adhesive capsulitis patients. The study involves use of a self-structured Bengali version questioner that may takes 20 to 30 minutes to fill the questionnaire or participate in the test for collection of specimen and have no likelihood of any harm to the participants. The members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 09:30 AM on 24th January, 2018 at BHPI.

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring in the course of the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,


Muhammad Millat Hossain
Assistant Professor, Dept. of Rehabilitation Science
Member Secretary, Institutional Review Board (IRB)
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Permission Letter

July 07, 2018

Head, Department of Physiotherapy,
Centre for the Rehabilitation of the Paralyzed (CRP)
Chapain, Savar, Dhaka -1343.

Through: Head, Department of Physiotherapy, BHPI.

Subject: Permission to collect data in order to conduct my research project.

Respected sir,

With due respect and humble submission to state that I am Mushfiqua Tabassum, student of 4th professional B.Sc. in physiotherapy at Bangladesh Health Professions Institute (BHPI). According to the course curriculum, I have to conduct a research project for the partial fulfillment of the degree of B.Sc. in Physiotherapy. The title of my research project is "Effectiveness of scapular stabilization exercise for the patient with adhesive capsulitis in CRP". I want to collect data for my research project from the patients of musculoskeletal unit. Department of Physiotherapy, CRP- Savar. My research project is supervised by the supervision of Ehsanur Rahman, Assistant Professor, Department of Physiotherapy, BHPI. CRP. So, I need permission for data collection from the musculoskeletal unit of physiotherapy department of CRP-Savar. I would like to assure that anything of my study will not be harmful for the participants.

I, therefore pray and hope that you would be kind enough to grant my application and give me permission for data collection and oblige thereby.

Mushfiqua Tabassum

Mushfiqua Tabassum

4th Professional B.Sc. in physiotherapy

Roll-04, Session: 2013-2014

Bangladesh Health Professions Institute (BHPI)

CRP, Chapain, Savar, Dhaka-1343.

Reviewed and
forwarded for
your kind permission
E. Reh
15.07.18

Approved

(Signature)
21/07/18
Mohammad Anwar Hossain
Associate Professor & Head
Physiotherapy Dept., CRP
CRP-Chapain, Savar, Dhaka-1343

(Signature)
15.07.18
Prof. Md. Obaidul Haque
Vice-Principal
BHPI, CRP, Savar, Dhaka.

Consent Form

Assalamualaikum,

I am MushfiquaTabassum, student of 4th year B.Sc. in physiotherapy at Bangladesh Health Professions Institute (BHPI). I am conducting this study for my Bachelor research project entitled “Effectiveness of scapular stabilization exercise with conventional physiotherapy among adhesive capsulitis patients attended at CRP”. I would like to ask you some personal and other shoulder pain related questions will apply some physical treatment. This will take approximately 20 minutes.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. All information provided by you will be kept confidential and in the event of any report or publication it will be ensured that the source of information remains anonymous. Your participation in this study is voluntary and you may withdraw yourself at any time during this study without any negative consequences. You also have the right not to answer a particular question that you don't like or do not want to answer during interview.

If you have any query about the study, you may contact with MushfiquaTabassum. Researcher and/ or Ehsanur Rahman, Assistant Professor, Physiotherapy Department, BHPI. CRP, Savar, Dhaka-1343.

So, May I start now?

- Yes
- No

Signature of the Patient:

Date:

Signature of the Data Collector:

Date:

Signature of the Witness:

Date:

Questionnaire (English)

SECTION-A: Subjective Information

This questionnaire is developed to measure the pain of the patient with adhesive capsulitis, and this section will be filled (√) mark in the left of point by, patients but in special consideration physiotherapist using a black or blue pen.

Date:

Patient's name:

Patient's ID:

Address:

Mobile number:

Questions	Answer
Ageyears
Sex	Male Female
Occupation	Service holder =1 Businessman =2 House wife =3 Student =4 Retires =5 Others =6
What is the main issue that brought you in today?	
You perform any repetitive or forceful tasks or movements?	Yes =1 No =2
Is now the pain same as before?	Improving =1 Worsening =2 Staying the same =3
What is the duration of pain?	Every time =1 Sometime =2
Others health problem	Diabetes =1 Cardiovascular disease =2 Hypo or Hyper Thyroidism =3

Before Treatment (Pre-Test)

SECTION-B: Pain Status

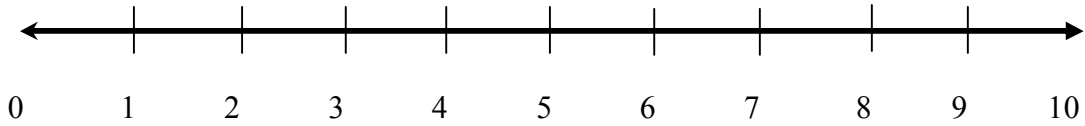
This questionnaire is designed for adhesive capsulitis patients. McCaffery et al. (1999) used a numeric scale to rate the pain status experienced by patients. It is known as Numeric Pain Rating Scale. The scale is a 10cm long scale ranging from 0-10. Here a zero (0) means no pain, 1-3 indicates mild pain, 3-5 indicates that pain is in moderate state and 6-10 is worst possible pain feeling experienced by patients.

This section of questionnaire will be filled by the patient using a black or blue coloured ball pen. If the patient struggles to understand the meaning of a question, physiotherapist is requested to clear the meaning of certain portions.

Rate the average amount of pain in your shoulder by encircling the number that best describes your pain on a scale from 0-10. A zero (0) represents no pain and a ten (10) represents worst pain you have ever experienced.

1. How Severe Your Pain Is?

Pre-test:



A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain.

2. How severe your pain is at resting position?

Pre-test:



A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain.

3. How severe is your pain during rising your hand sideways?

Pre- test:



A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain.

4. How severe is your pain during combing hair?

Pre- test:



A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain

5. How severe is your pain during lying in affected side?

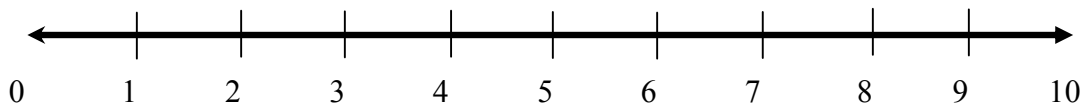
Pre- test:



A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain

6. How severe is your pain during placing an object on high shelf?

Pre- test:



A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain

7. How severe is your pain during pushing with the involved arm?

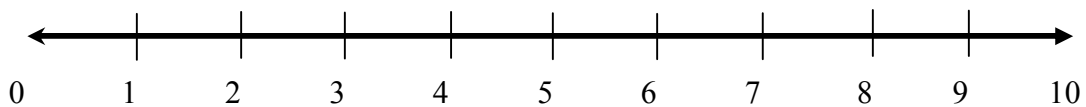
Pre- test:



A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain

8. How severe is your pain during removing something from your back?

Pre- test:



A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain

After Treatment (Post -Test)

SECTION-C:Pain Status

1.How severe your pain is?

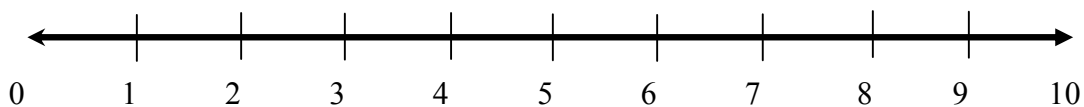
Pre- test:



A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain.

2. How severe your pain is at resting position?

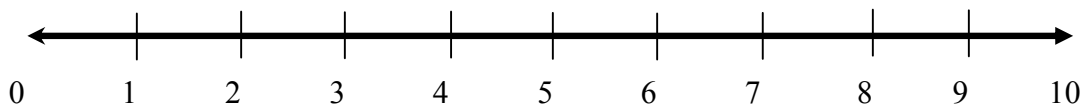
Pre- test:



A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain.

3.How severe is your pain during rising your hand sideways?

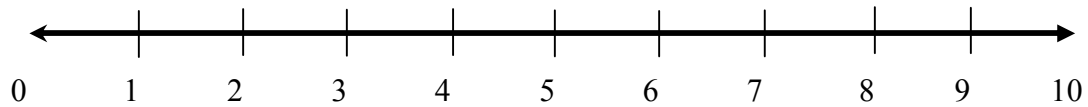
Pre- test:



A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain.

4. How severe is your pain during combing hair?

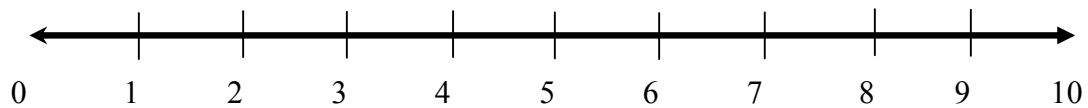
Pre- test:



A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain

5. How severe is your pain during lying in affected side?

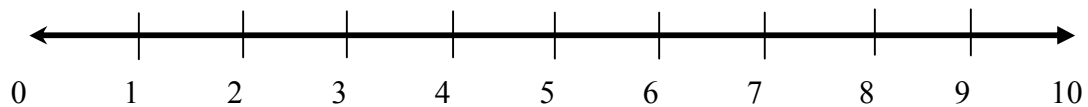
Pre- test:



A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain

6. How severe is your pain during placing an object on high shelf?

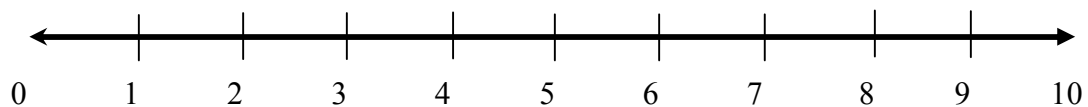
Pre- test:



A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pa

7. How severe is your pain during pushing with the involved arm?

Pre- test:



A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain

8. How severe is your pain during removing something from your back?

Pre- test:



A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain

Before Treatment (Pre-Test)
SECTION-D: Estimate Functional Disability

	No Difficulty										Unable to do
Combing hair	0	1	2	3	4	5	6	7	8	9	10
Washing your back	0	1	2	3	4	5	6	7	8	9	10
Putting on shirt	0	1	2	3	4	5	6	7	8	9	10
Putting on a shirt that buttons down the front	0	1	2	3	4	5	6	7	8	9	10
Writing with a pen or typing	0	1	2	3	4	5	6	7	8	9	10
Carrying a heavy object	0	1	2	3	4	5	6	7	8	9	10
Household work	0	1	2	3	4	5	6	7	8		10
Work (your job or everyday work)	0	1	2	3	4	5	6	7	8		10

Here, by circling the number that best describes difficulty on a scale of 0-10. A zero (0) means Patient did not experience any difficulty and a ten (10) means it was so difficult, were unable to do it at all.

After Treatment (Post -Test)
SECTION-E: Estimate Functional Disability

	No Difficulty											Unable to do
Combing hair	0	1	2	3	4	5	6	7	8	9	10	
Washing your back	0	1	2	3	4	5	6	7	8	9	10	
putting on shirt	0	1	2	3	4	5	6	7	8	9	10	
Putting on a shirt that buttons down the front	0	1	2	3	4	5	6	7	8	9	10	
Writing with a pen or typing	0	1	2	3	4	5	6	7	8	9	10	
Carrying a heavy object	0	1	2	3	4	5	6	7	8	9	10	
Household work	0	1	2	3	4	5	6	7	8		10	
Work (your job or everyday work)	0	1	2	3	4	5	6	7	8		10	

Here, by circling the number that best describes difficulty on a scale of 0-10. A zero (0) means Patient did not experience any difficulty and a ten (10) means it was so difficult, were unable to do it at all.

Before & After Treatment

SECTION-F: Estimate the range of motion

This section of questionnaire will be filled by the physiotherapist or examiner using a black or blue colored ball pen and measure ROM by using Goniometer.

1. Passive ROM of scapular protraction of affected shoulder? (After 6 session treatment)

Pre-treatment..... Degrees

Post treatment..... Degrees

2. Passive ROM of scapular retraction of affected shoulder? (After 6 session treatment)

Pre-treatment..... Degrees

Post treatment..... Degrees

3. Passive ROM of scapular elevation of affected shoulder? (After 6 session treatment)

Pre-treatment..... Degrees

Post treatment..... Degrees

সম্মতিপত্র

আসসালামুআলাইকুম। আমার নাম মুশফিকা তাবাসসুম বাংলাদেশ হেলথ প্রফেশনস ইন্সটিটিউট এর ফিজিওথেরাপী চতুর্থ বর্ষের ছাত্রী। আমি এই গবেষণা টি ব্যাচেলর অব সাইন্স ইন ফিজিওথেরাপী ডিগ্রির পরিপূর্ণতার জন্যে করছি। আমার গবেষণার নাম –“এডহেসিভ ক্যাপসুলাইটিসেক্স্যাপুলার মাংসপেশির স্থিতিশীলতা অনুশীলনের কার্যকারিতা”। আমি আপনাকে কিছু ব্যক্তিগত এবং ব্যথা সম্পর্কিত প্রশ্ন করব এবং কিছু শারীরিক চিকিৎসা প্রয়োগ করব যা আনুমানিক ২০ মিনিট সময় নিবে।

আমি আপনাকে আশ্বস্ত করছি যে, এটি একটি সম্পূর্ণ একাডেমিক শিক্ষা এবং তা অন্য কোনো ক্ষেত্রে ব্যবহার করা হবেনা। আপনার দেওয়া সমস্ত তথ্য গোপনীয়তার সাথে সংরক্ষণ করা হবে এবং যখন এটি কোনো রিপোর্টে ব্যবহার করা হবে নামবিহীন ভাবে তা প্রকাশিত হবে। আপনি এই গবেষণায় স্বেচ্ছায় অংশগ্রহণ করছেন এবং যদি আপনি চাইলে কোনো নেতিবাচক ফল ছাড়াই এই গবেষণা থেকে নিজেকে সরিয়ে নিতে পারেন। অবশ্যই আপনার অধিকার আছে কোনো প্রশ্নের উত্তর না দেওয়ার যদি তা আপনার একান্ত ব্যক্তিগত বলে আপনি মনে করেন।

গবেষণাটি সম্পর্কে আপনার কিছু জানার থাকলে আপনি গবেষক মুশফিকা তাবাসসুম এবং/ অথবা এহসানুর রহমান (সহকারি অধ্যাপক, ফিজিওথেরাপী বিভাগ বি.এইচ.পি.আইসি.আর.পি সাভার, ঢাকা-১৩৪৩) এর সাথে যোগাযোগ করতে পারেন।

আমি কি শুরু করতে পারি?

হ্যাঁ না

আমি এই সম্মতিপত্রপড়েছিও বুঝেছি এবং স্বেচ্ছায় এই গবেষণায় অন্তর্ভুক্ত হচ্ছি।

অংশগ্রহণকারীর স্বাক্ষর

তারিখ

তথ্য সংগ্রহকারীর স্বাক্ষর

তারিখ

সাক্ষীর স্বাক্ষর

তারিখ

প্রশ্নবলী

পর্ব ক : সামাজিক ও বৈষয়িক তথ্যবলী

এই প্রশ্নগুলো একজন “এডিসিড ক্যালসুলাইটিস” রোগে আক্রান্ত রোগীর ব্যথা পরিমাপের জন্য সাজানো হয়েছে, এই পর্বে রোগী পয়েন্টের বামে (√) চিহ্ন দিয়ে দিবেন, কিন্তু বিশেষ ক্ষেত্রে নীল বা কালো কালির কলম দিয়ে ফিজিওথেরাপিস্ট এর সাহায্য নিবেন।

রেজি নং :

তারিখ :

রোগীর নাম :

রোগীর আইডি :

ঠিকানা :

মোবাইল :

প্রশ্নসমূহ	উত্তর
১। রোগীর বয়সবৎসর
২। লিঙ্গ	<input type="radio"/> পুরুষ <input type="radio"/> মহিলা
৩। পেশা	<input type="radio"/> চাকুরিজীবী <input type="radio"/> ব্যবসায়ী <input type="radio"/> গৃহিনী <input type="radio"/> ছাত্র <input type="radio"/> অবসর <input type="radio"/> অন্যান্য
৪। প্রধান কোন কারণে আপনি এখানে এসেছেন	
৫। আপনি কি পুনরাবৃত্তিক বা বল পূর্বক কোন কাজ করেন	<input type="radio"/> হ্যাঁ <input type="radio"/> না
৬। ব্যথা শুরু অবস্থা থেকে এখনকার ব্যথা কি অবস্থায় আছে?	<input type="radio"/> ভাল হচ্ছে <input type="radio"/> খারাপ হচ্ছে <input type="radio"/> একই রকম আছে
৭। বর্তমানে সমস্যাটা কখন অনুভব হয়	<input type="radio"/> মাঝে মধ্যে <input type="radio"/> সবসময়
৮। অন্যান্য শারীরিক সমস্যা	<input type="radio"/> হৃদ রোগ <input type="radio"/> ডায়াবেটিস <input type="radio"/> হায়পো অথবা হায়পার থায়রয়ডিসম

চিকিৎসা পূর্ববর্তী উপাত্ত সমূহ

পর্ব- খ : ব্যথার ধরণ

এই প্রশ্নপত্রটি “এডিসিভ ক্যান্সলাইটিস” রোগীর জন্য তৈরী করা হয়েছে।

রোগীদের অনুভূত ব্যথার মাত্রা বোঝানোর জন্য McCaffery et al. (1999) একটি সাংখ্যিক স্কেল ব্যবহার করতেন। এটা সাংখ্যিক পেইন রেটিং স্কেল নামে পরিচিত। স্কেলটি (০-১০) সীমায় ১০ সে : লম্বা। এখানে ০ মানে ব্যথা নেই, (১-৩) বোঝায় অল্প ব্যথা, (৪-৬) বোঝায় অনেক ব্যথা, (৭-১০) মানে রোগীর সম্ভাব্য সবচেয়ে খারাপ ব্যথার অনুভূতি।

প্রশ্নবলির এই সেকশন রোগীকে কালো বা নীল কালি বলপেন দিয়ে পূরন করতে হবে। রোগী প্রশ্ন না বুঝতে পারলে সে অংশ টুকু বুঝিয়ে দিতে ফিজিওথেরাপিস্ট কে অনুরোধ করা হচ্ছে।

১। আপনার ব্যথার তীব্রতা কেমন?

চিকিৎসার পূর্বে



০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে ০ মানে ব্যথা নেই, (১-৩) বোঝায় অল্প ব্যথা, (৪-৬) বোঝায় অনেক ব্যথা, (৭-১০) মানে রোগীর সম্ভাব্য সবচেয়ে খারাপ ব্যথার অনুভূতি।

২। বিশ্রামের অবস্থায় আপনার ব্যথার পরিমাণ কত?

চিকিৎসার পূর্বে



০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে ০ মানে ব্যথা নেই, (১-৩) বোঝায় অল্প ব্যথা, (৪-৬) বোঝায় অনেক ব্যথা, (৭-১০) মানে রোগীর সম্ভাব্য সবচেয়ে খারাপ ব্যথার অনুভূতি।

৩। পাশাপাশি হাত তুলতে আপনার ব্যথার পরিমাণ কত?

চিকিৎসার পূর্বে



০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে ০ মানে ব্যথা নেই, (১-৩) বোঝায় অল্প ব্যথা, (৪-৬) বোঝায় অনেক ব্যথা, (৭-১০) মানে রোগীর সম্ভাব্য সবচেয়ে খারাপ ব্যথার অনুভূতি।

৪। চুল আঁচড়াতে আপনি কেমন ব্যথা পান?

চিকিৎসার পূর্বে

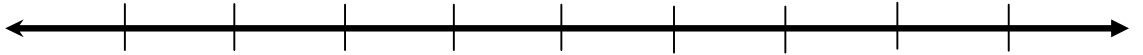


০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে ০ মানে ব্যথা নেই, (১-৩) বোঝায় অল্প ব্যথা, (৪-৬) বোঝায় অনেক ব্যথা, (৭-১০) মানে রোগীর সম্ভাব্য সবচেয়ে খারাপ ব্যথার অনুভূতি।

৫। আক্রান্ত পাশ হয়ে ঘুমাতে কেমন ব্যথা অনুভব করেন?

চিকিৎসার পূর্বে



০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে ০ মানে ব্যথা নেই, (১-৩) বোঝায় অল্প ব্যথা, (৪-৬) বোঝায় অনেক ব্যথা, (৭-১০) মানে রোগীর সম্ভাব্য সবচেয়ে খারাপ ব্যথার অনুভূতি।

৬। উঁচু কোন স্থান থেকে জিনিস নিতে কি পরিমাণ ব্যথা অনুভব করেন?

চিকিৎসার পূর্বে



০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে ০ মানে ব্যথা নেই, (১-৩) বোঝায় অল্প ব্যথা, (৪-৬) বোঝায় অনেক ব্যথা, (৭-১০) মানে রোগীর সম্ভাব্য সবচেয়ে খারাপ ব্যথার অনুভূতি।

৭। আক্রান্ত হাতে চাপ প্রয়োগের সময় কতটুকু ব্যথা অনুভব করেন?

চিকিৎসার পূর্বে



০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে ০ মানে ব্যথা নেই, (১-৩) বোঝায় অল্প ব্যথা, (৪-৬) বোঝায় অনেক ব্যথা, (৭-১০) মানে রোগীর সম্ভাব্য সবচেয়ে খারাপ ব্যথার অনুভূতি।

চিকিৎসার পরবর্তী উপাত্ত সমূহ

পর্ব- গ : ব্যথার ধরণ

১। আপনার ব্যথার তীব্রতা কেমন?

চিকিৎসার পরে



০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে ০ মানে ব্যাথা নেই, (১-৩) বোঝায় অল্প ব্যাথা, (৪-৬) বোঝায় অনেক ব্যাথা, (৭-১০) মানে রোগীর সম্ভাব্য সবচেয়ে খারাপ ব্যথার অনুভূতি।

২। বিশ্রামের অবস্থায় আপনার ব্যথার পরিমাণ কত?

চিকিৎসার পরে

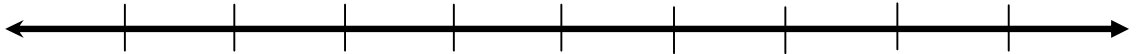


০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে ০ মানে ব্যাথা নেই, (১-৩) বোঝায় অল্প ব্যাথা, (৪-৬) বোঝায় অনেক ব্যাথা, (৭-১০) মানে রোগীর সম্ভাব্য সবচেয়ে খারাপ ব্যথার অনুভূতি।

৩। পাশাপাশি হাত তুলতে আপনার ব্যথার পরিমাণ কত?

চিকিৎসার পরে



০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে ০ মানে ব্যাথা নেই, (১-৩) বোঝায় অল্প ব্যাথা, (৪-৬) বোঝায় অনেক ব্যাথা, (৭-১০) মানে রোগীর সম্ভাব্য সবচেয়ে খারাপ ব্যথার অনুভূতি।

৪। চুল আঁচড়াতে আপনি কেমন ব্যথা পান?

চিকিৎসার পরে

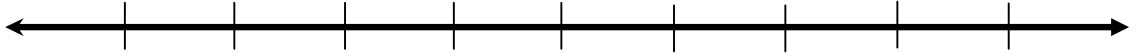


০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে ০ মানে ব্যথা নেই, (১-৩) বোঝায় অল্প ব্যথা, (৪-৬) বোঝায় অনেক ব্যথা, (৭-১০) মানে রোগীর সম্ভাব্য সবচেয়ে খারাপ ব্যথার অনুভূতি।

৫। আক্রান্ত পাশ হয়ে ঘুমাতে কেমন ব্যথা অনুভব করেন?

চিকিৎসার পরে



০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে ০ মানে ব্যথা নেই, (১-৩) বোঝায় অল্প ব্যথা, (৪-৬) বোঝায় অনেক ব্যথা, (৭-১০) মানে রোগীর সম্ভাব্য সবচেয়ে খারাপ ব্যথার অনুভূতি।

৬। উঁচু কোন স্থান থেকে জিনিস নিতে কি পরিমাণ ব্যথা অনুভব করেন?

চিকিৎসার পরে



০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে ০ মানে ব্যথা নেই, (১-৩) বোঝায় অল্প ব্যথা, (৪-৬) বোঝায় অনেক ব্যথা, (৭-১০) মানে রোগীর সম্ভাব্য সবচেয়ে খারাপ ব্যথার অনুভূতি।

৭। আক্রান্ত হাতে চাপ প্রয়োগের সময় কতটুকু ব্যথা অনুভব করেন?

চিকিৎসার পরে



০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে ০ মানে ব্যথা নেই, (১-৩) বোঝায় অল্প ব্যথা, (৪-৬) বোঝায় অনেক ব্যথা, (৭-১০) মানে রোগীর সম্ভাব্য সবচেয়ে খারাপ ব্যথার অনুভূতি।

চিকিৎসার পূর্ববর্তী উপাত্ত সমূহ

পর্ব- ঘ : কর্মকাণ্ডে অক্ষমতা নির্ণয়

	সমস্যা নেই										করতে পারেনা
চুল আঁচড়ানো	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
পিঠ পরিষ্কার করা	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
কাপড় পরিধান করা	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
কিছু লিখা বা টাইপ করা	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
ভারী কিছু বহন করা	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
হাত পেছনে নেওয়া	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
গৃহস্থলির কাজ	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
চাকুরি ক্ষেত্রের কাজ	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০

এখানে (০-১০) সীমায় ব্যথা অনুযায়ী নাম্বারে বৃত্তাংন করতে হবে। ০ মানে রোগী কোন সমস্যার সম্মুখীন হননি। আর ১০ মানে তিনি কাজটি করতে পারেন না বা খুব অসুবিধা হয়েছে।

চিকিৎসার পরবর্তী উপাত্ত সমূহ

পর্ব- ৬ : কর্মকাণ্ডে অক্ষমতা নির্ণয়

	সমস্যা নেই										করতে পারেনা
চুল আঁচড়ানো	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
পিঠ পরিষ্কার করা	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
কাপড় পরিধান করা	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
কিছু লিখা বা টাইপ করা	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
ভারী কিছু বহন করা	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
হাত পেছনে নেওয়া	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
গৃহস্থলির কাজ	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
চাকুরি ক্ষেত্রের কাজ	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০

এখানে (০-১০) সীমায় ব্যথা অনুযায়ী নাম্বারে বৃত্তাংন করতে হবে। ০ মানে রোগী কোন সমস্যার সম্মুখীন হননি। আর ১০ মানে তিনি কাজটি করতে পারেন না বা খুব অসুবিধা হয়েছে।

চিকিৎসার পূর্ববর্তী ও পরবর্তী উপাত্ত সমূহ

পর্ব- চ : গতি পরিসীমা নির্ণয়

এই সেকশন কোন ফিজিওথেরাপিস্ট বা পরীক্ষক কালো বা নীল কালির বলপেন দিয়ে পূরন করবেন এবং গতি গনিওমিটার নির্ণয় করবেন।

১। আক্রান্ত কাধের স্ক্যাপুলার প্রোট্রাকশন (৬ সেশন চিকিৎসার পর)

চিকিৎসার পূর্বেডিগ্রি

চিকিৎসার পরডিগ্রি

২। আক্রান্ত কাধের স্ক্যাপুলার রিট্রাকশন (৬ সেশন চিকিৎসার পর)

চিকিৎসার পূর্বেডিগ্রি

চিকিৎসার পরডিগ্রি

৩। আক্রান্ত কাধের স্ক্যাপুলার ইলিভেশন (৬ সেশন চিকিৎসার পর)

চিকিৎসার পূর্বেডিগ্রি

চিকিৎসার পরডিগ্রি

Shoulder Pain and Disability Index (SPADI)

Please place a mark on the line that best represents your experience during the last week attributable to your shoulder problem.

Pain scale

How severe is your pain?

Circle the number that best describes your pain where: 0 = no pain and 10 = the worst pain imaginable.

At its worst?	0	1	2	3	4	5	6	7	8	9	10
When lying on the involved side?	0	1	2	3	4	5	6	7	8	9	10
Reaching for something on a high shelf?	0	1	2	3	4	5	6	7	8	9	10
Touching the back of your neck?	0	1	2	3	4	5	6	7	8	9	10
Pushing with the involved arm?	0	1	2	3	4	5	6	7	8	9	10

Disability scale

How much difficulty do you have?

Circle the number that best describes your experience where: 0 = no difficulty and 10 = so difficult it requires help.

Washing your hair?	0	1	2	3	4	5	6	7	8	9	10
Washing your back?	0	1	2	3	4	5	6	7	8	9	10
Putting on an undershirt or jumper?	0	1	2	3	4	5	6	7	8	9	10
Putting on a shirt that buttons down the front?	0	1	2	3	4	5	6	7	8	9	10
Putting on your pants?	0	1	2	3	4	5	6	7	8	9	10
Placing an object on a high shelf?	0	1	2	3	4	5	6	7	8	9	10
Carrying a heavy object of 10 pounds (4.5 kilograms)	0	1	2	3	4	5	6	7	8	9	10
Removing something from your back pocket?	0	1	2	3	4	5	6	7	8	9	10

A Patient's Guide to Adhesive Capsulitis & Scapular Stabilization Exercises



Prepared by
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4th year B.Sc. in Physiotherapy
Session: 2013-14

- **What is Adhesive Capsulitis?**

Frozen shoulder (adhesive capsulitis) is stiffness, pain, and limited range of movement in your shoulder. It may happen after an injury or overuse or from a disease such as diabetes or a stroke. Adhesive capsulitis, commonly referred to as frozen shoulder, is associated with synovitis and capsular contracture of the shoulder joint and can be classified as either primary or secondary.

- **How do you insure that you have Adhesive Capsulitis?**

You should be able to move your shoulder in all directions without pain. To test yourself, do these things.

- Reach up toward the sky with both arms.
- Reach your arms out straight in front of you.
- Raise your arms out of the sides of your body.
- Pretend that you are trying to unzip the back of your dress or pull your wallet from the back pocket of your pant.

If you have pain or stiffness in your shoulder when you try to do these things, you may have adhesive capsulities.

- **Can physiotherapy help?**

Yes, it can. A physiotherapist will make a detailed assessment of your condition and put together a treatment programme for your specific problem.


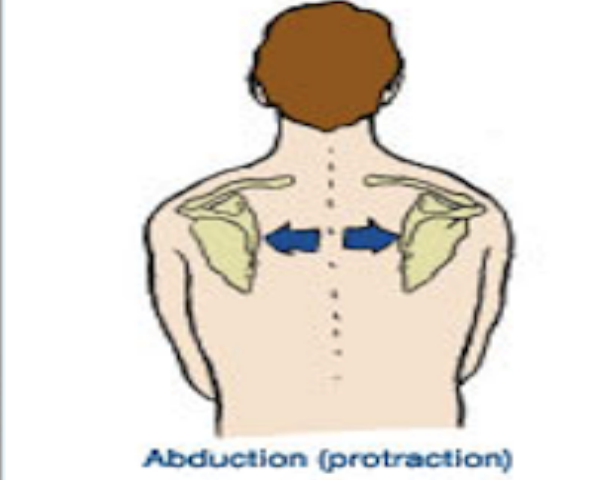
This may include:-

- Manual therapy
- Electrotherapy
- Hot & cold therapy
- Other treatment for specific condition

- **Exercises:**

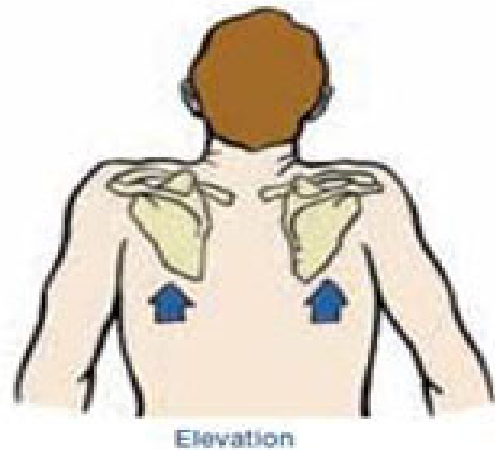
Regular exercise to restore your normal shoulder motion and flexibility and a gradual return to everyday work and recreational activities are important for full recovery. The scapula is the base of support to shoulder joint and all movements of the upper extremity. Poor scapular stabilization can contribute to a variety of syndrome such as shoulder impingement, shoulder instability, nerve entrapment and muscle strains. So scapular stabilization exercise is very important to reduce painful ROM and increase the strength of the scapular stabilizing muscles.

These are:-

<p>Scapular Retraction:</p> <ul style="list-style-type: none"> ➤ Relax head and neck. ➤ Stand with good posture. Try to bring your shoulder blades together in back of you. ➤ Hold 10 sec. ➤ Relax shoulder. Repeat 10 times. ➤ Frequency: 1 set. Three times a day. ➤ Goal: Increase strength of scapular stabilizing muscles 	
<p>Scapular protraction:</p> <ul style="list-style-type: none"> ➤ Relax head and neck. ➤ Stand with good posture. Try to bring your shoulder blades together in front of you. ➤ Hold 10 sec. ➤ Relax shoulder. Repeat 10 times. ➤ Frequency: 1 set. Three times a day. ➤ Goal: Increase strength of scapular stabilizing muscles. 	 <p>Abduction (protraction)</p>

Scapular elevation:

- Relax head and neck.
- Stand with good posture. try to move scapula up or towards the head like when you are shrugging your shoulders.
- Hold 10 sec.
- Relax shoulder. Repeat 10 times.
- **Frequency:** 1 set. Three times a day.
- **Goal:** Increase strength of scapular stabilizing muscles.



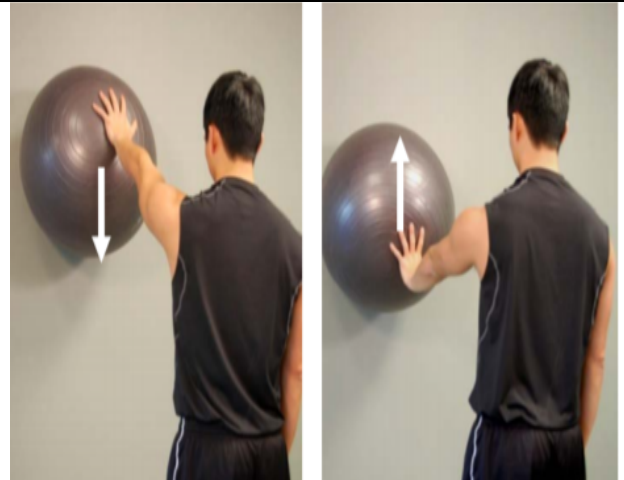
Scapular depression:

- Relax head and neck.
- Stand with good posture. try to depress your shoulder blades , they move back down of toward the feet.
- Hold 10 sec.
- Relax shoulder. Repeat 10 times.
- **Frequency:** 1 set. Three times a day.
- **Goal:** Increase strength of scapular stabilizing muscles



Physioball Scapular Exercises:

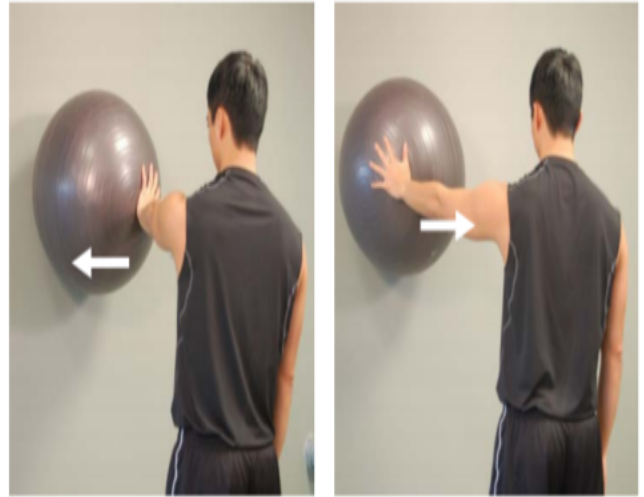
- Stand with hand placed on physioball against a wall.
- Bring shoulders back and down
- Slowly roll hand up and down over the ball
- Maintain shoulders back and down
- **Frequency:** 1 set of 10 reps per day.
- **Goal:** Improve scapular



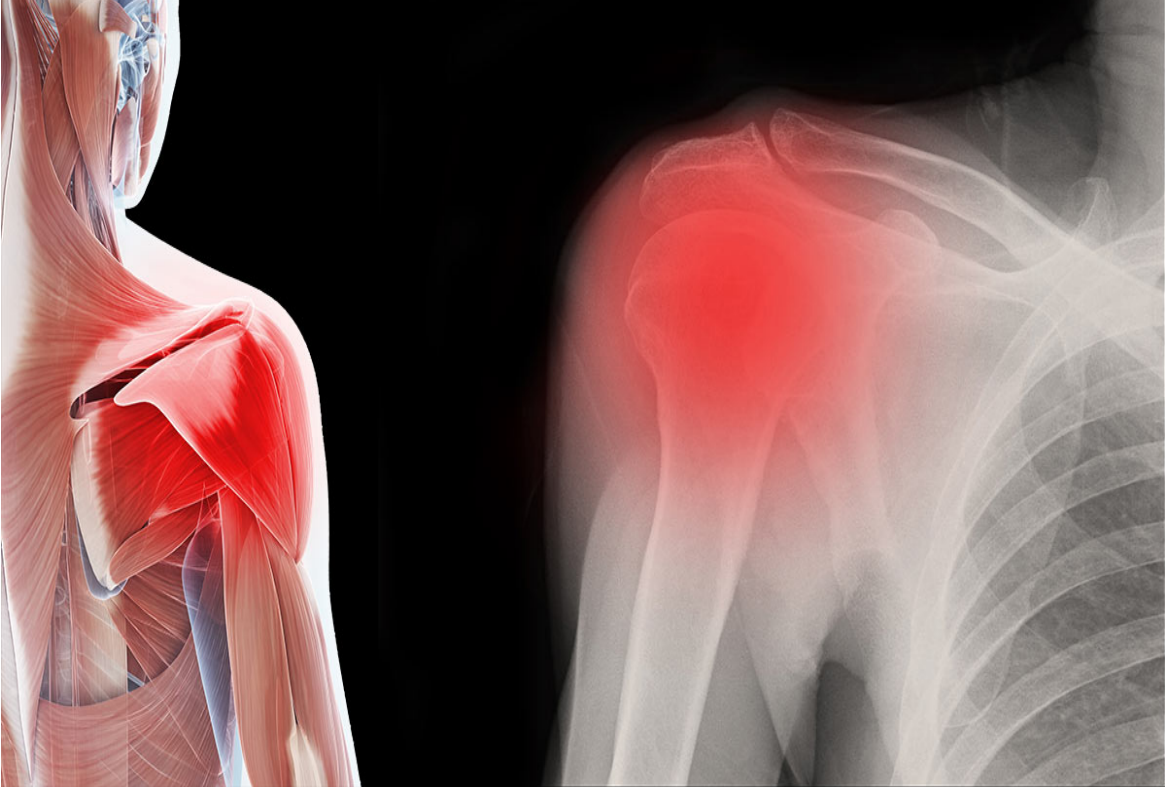
strength.

Physioball Scapular Exercises:

- Stand with hand placed on physioball against a wall.
- Bring shoulders back and down
- Slowly roll hand side to side over the ball.
- Maintain shoulders back and down.
- **Frequency:** 1 set of 10 reps per day.
- **Goal: Improve scapular strength**



একজন রোগীর এডহেসিভ ক্যাপ্সুলাইটিস
এবং
স্ক্যাপুলার স্থিতিশীলতায় করণীয় নির্দেশিকা।



মুশফিকা তাবাসসুম

চতুর্থ বর্ষ বিএসসি ইন ফিজিওথেরাপি

সেশনঃ ২০১৩-১৪

• এডহেসিভ ক্যাপ্সুলাইটিস কি?

জমেয়াওয়া ঘাড়(এডহেসিভ ক্যাপ্সুলাইটিস)বলতেবোঝায় ঘাড়েঅসহনীয় ব্যথাএবং সীমিত পরিসরেআপনারঘাড়কেনাডাতে না পারা।এটিকোনোপ্রকারআঘাতবাঅতিরিক্ত ব্যবহার বা কোনো রোগ এর কারণে, বিশেষ করে ডায়াবেটিস বা স্ট্রোক থেকে হতে পারে। একে এডহেসিভক্যাপ্সুলাইটিসও বলা হয়।

• আপনি কিভাবে নিশ্চিতহবেন যে আপনার এডহেসিভ ক্যাপ্সুলাইটিস আছে?

আপনি আপনার ঘাড় সবদিকে ব্যথা ছাড়া ঘুরাতে সক্ষম হবেন।নিজেকে পরীক্ষা করতে নিচের কাজ গুলো করুন।

- দুইবাহুএকসাথেআকাশেরদিকেতুলেধরুন।
- দুহাতআপনারসামনেরদিকেসোজাকরেতুলুন।
- আপনারশরীরেরদুইপাশেদুইহাতউঠান।
- ধরুন,আপনিআপনারজামারপিছনেরবোতামখুলছেনবাআপনারপেছনেরপকেটথেকেআপনারব্যাগবেরকরছেন।

যদিআপনিউপরোক্তকাজগুলোকরতে ব্যথাঅনুভবকরেনবাআপনারঘাড় শক্ত হয়ে যাওয়া অনুভবকরেনতবেআপনারএডহেসিভক্যাপ্সুলাইটিসআছে।

• একজন ফিজিওথেরাপিস্ট কি আপনাকে সহযোগিতা করতে পারে?

হ্যাঁ, পারে।একজন ফিজিওথেরাপিস্ট আপনার অবস্থা বিস্তারিত ভাবে মূল্যায়ন করবে এনং আপনার সাথে আলোচনার ভিত্তিতে আপনার নির্ধারিত সমস্যা সমাধানের জন্য চিকিৎসা কর্মসূচি তৈরি করবেন। যার অন্তর্ভুক্ত থাকবে:-

- ম্যানুয়ালথেরাপি।
- ইলেক্টোথেরাপি
- গরমএবংঠাণ্ডাথেরাপি
- নির্দিষ্টঅবস্থারসাপেক্ষেঅন্যান্যচিকিৎসা।

- **কাঁধের ফিজিওথেরাপি সমূহঃ**

নিয়মিত ব্যায়াম আপনার কাঁধের মাংসপেশি সচল রাখে এবং ব্যথা দূর করে আপনার দৈনন্দিন কাজে গুরুত্বপূর্ণ ভূমিকা পালন করে। আপনার কাঁধ ও হাতের সকল চলাচলের ভিত্তি হল স্ক্যাপুলা। ত্রুটিপূর্ণ স্ক্যাপুলা বিভিন্ন সমস্যা সৃষ্টি করে। যেমন কাঁধের স্থিতিশীলতা, স্নায়ুর চাপ,পেশির টান ইত্যাদি। তাই স্ক্যাপুলার স্থিতিশীলতার ব্যায়ামগুলো আপনার ব্যথা কমিয়ে মাংসপেশির শক্তি বাড়াতে সাহায্য করবে।

- **ফিজিওথেরাপি গুলোঃ**

স্ক্যাপুলার রিট্রাকশনঃ

- আপনার কাঁধ ও ঘাড় স্বাভাবিক রাখুন।
- সোজা হয়ে দাঁড়ান এবং আপনার কাঁধকে একসাথে পেছনের দিকে নিন।
- ১০ সেকেন্ড ধরে রাখুন।
- আবার আগের অবস্থানে আসুন এবং একইভাবে ১০ বার করুন।
- ১ সেট , দিনে ৩ বার
- লক্ষ্যঃ স্ক্যাপুলার মাংসপেশির শক্তি বাড়ানো।



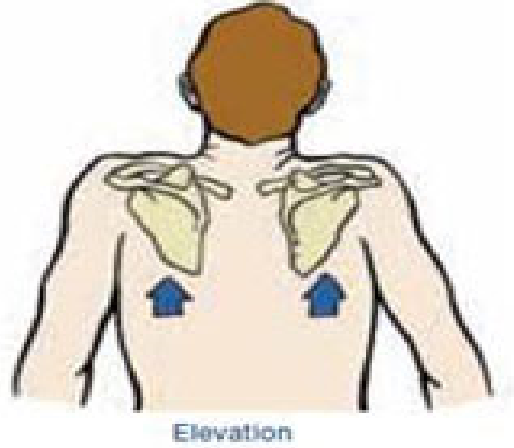
স্ক্যাপুলার প্রোট্রাকশন:

- আপনার কাঁধ ও ঘাড় স্বাভাবিক রাখুন।
- সোজা হয়ে দাঁড়ান এবং আপনার কাঁধকে একসাথে সামনের দিকে নিন।
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- ১ সেট, দিনে ৩ বার
- লক্ষ্য: স্ক্যাপুলার মাংসপেশির শক্তি বাড়ানো।
-



স্ক্যাপুলার এলিভেশন:

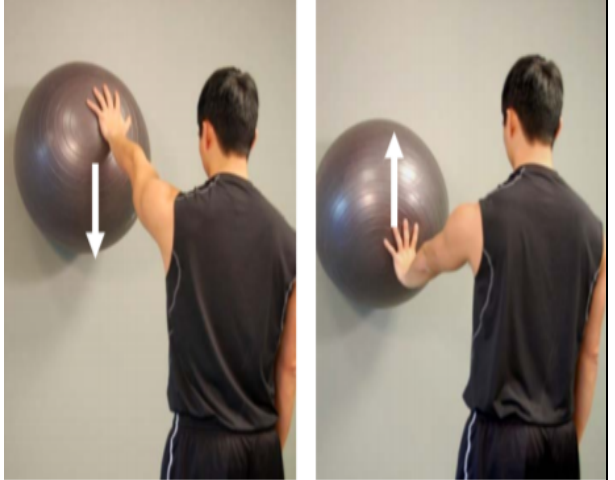
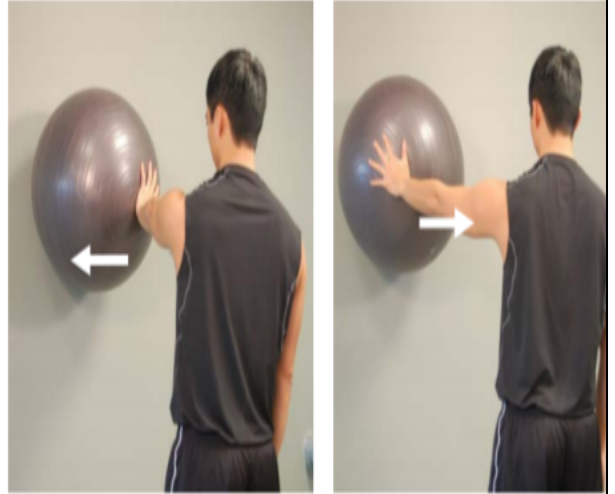
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স্ক্যাপুলার ডিপ্রেশন:

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<p>একইভাবে ১০ বার করুন।</p> <ul style="list-style-type: none"> ➤ ১ সেট, দিনে ৩ বার ➤ লক্ষ্য: স্ক্যাপুলার মাংসপেশির শক্তি বাড়ানো। ➤ 	
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