



Faculty of Medicine

University of Dhaka

**ACOMPARISM BETWEEN MYOFASCIAL RELEASE (MFR) TECHNIQUE
ALONG WITH CONVENTIONAL PHYSIOTHERAPY AND ONLY
CONVENTIONAL PHYSIOTHERAPY ON PATIENTS WITH ADHESIVE
CAPSULITIS AT SHOULDER**

By

Ratan Kumar Das

Master of Science in Physiotherapy

Session: 2016-2017

Registration No: 2568

Roll No: 202

Submitted in Partial Fulfillment of the Requirements for the Degree of Master of
Science in Physiotherapy



Department of Physiotherapy

Bangladesh Health Professions Institute (BHPI)

May 2018



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Declaration Form

- This work has not previously been accepted in substance for any degree and is not concurrently submitted in candidate for any degree
- This dissertation is being submitted in partial fulfillment of the requirements for the degree of M.Sc. in Physiotherapy.
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List of Abbreviations or Symbols

ADL	Activity of Daily living
AROM	Active range of motion
BHPI	Bangladesh Health Professions Institute
BMRC	Bangladesh Medical & Research Council
BMI	Body Mass Index
CRP	Centre for the Rehabilitation of the Paralysed
IRB	Institutional Review Board
NPRS	Numerical Pain Rating Scale
PROM	Passive range of motion
ROM	Range of Motion
SPADI	Shoulder Pain and Disability Index
USA	United states of America
VAS	Visual Analogue Scale
WHO	World Health Organization

ABSTRACT

Background: Adhesive Capsulitis of shoulder is characterized by an insidious and progressive pain and loss of active and passive mobility in the glenohumeral joint due to capsular contracture and scapula-thoracic muscle tightness. With respect to Physical therapy, a variety of interventions, different type of mobilization techniques and exercise are used to reduce pain, increase range of motion (ROM) and functions in Adhesive. But no published studies talk about the combined effect of Myofascial release technique (MFR) with conventional physiotherapy in Adhesive Capsulitis of shoulder.

Aim: The aim of this study was to compare the effectiveness of Myofascial release technique (MFR) along with conventional physiotherapy and only conventional physiotherapy on subjects with adhesive capsulitis of shoulder.

Materials and Methods: This study includes 30 subjects randomly distributed into two groups (control group receive conventional physiotherapy and experimental group receive MFR technique along with conventional physiotherapy) including 15 subjects in each group. The mean age in the control group was 56.33 years and in experimental group was 54.64 years. Both male and female were included in the groups. Subject's ROM and pain assessment was made before the execution of treatment. ROM was done with the help of Universal Goniometer and the pain level measurement was done by Numeric Pain Rating Scale (NPRS) and functional disability by Shoulder Pain and Disability Index (SPADI). After completing of all the treatment sessions to both the groups again pain,

ROM and functions were measured for outcome progression. Each group was treated for 12 sessions of 3 days in a week for 4 weeks.

Results: Subjects in the both groups overall improved. Greater changes were found within the groups statistically significant ($p < 0.05$) pre-test and post-test score of pain, function and range of motion (ROM). That was the mean of difference of pain intensity 2.40 (with sd 1.29) and functional disability 29.66 (20.04) in experimental group and pain intensity 2.26 (.79) and functional disability 27.86 (20.02) in control group. In active range of motion of shoulder (AROM) joints flexion 27.66 (with sd 19.35), abduction 38.66 (33.61), medial rotation 21.66 (17.28) and lateral rotation 25.66 (18.11) in experimental and active flexion 18.00 (11.46), abduction 22.66 (16.56), medial rotation 19.00 (13.25) and lateral rotation 18.33 (12.91) in control group. Similarly found passive flexion 25.33 (17.97), abduction 29.00 (26.06), medial rotation 23.66 (17.67) and lateral rotation 25.66 (18.50) in experimental and passive flexion 14.00 (9.29), abduction 20.66 (17.91), medial rotation 14.00 (12.70) and lateral rotation 17.66 (11.62) in control group. Insignificant differences were found for each of the variables between groups comparison.

Conclusion: The results of this study suggest that either Myofascial release technique (MFR) along with conventional physiotherapy or only conventional physiotherapy are equally effective interventions for patients with shoulder adhesive capsulitis.

1.1 Background:

Adhesive capsulitis or Frozen Shoulder is glenohumeral arthritis. Frozen shoulder syndrome was first described by Duplay in 1872. He used the term peri-arthritis scapulo-humeral. It is characterized by both active and passive range of motion of shoulder joint is progressively loss and affecting many activities of daily life (Celik and Mutlu, 2016). In 2009, Captuli used the term frozen shoulder to describe this condition. Adhesive capsulitis a term is an orthopaedic condition that is commonly encountered in general practice. It is characterized by an insidious and progressive loss of active and passive mobility in the glenohumeral joint presumably due to capsular Contracture. He stated that most cases resolved in about two years without treatment. More recently, Zuckerman and Cuomo defined frozen shoulder or idiopathic adhesive capsulitis as a condition of uncertain etiology characterized by substantial restriction of both active and passive shoulder motion that occurs in the absence of a known intrinsic shoulder disorder (Griggs, et al., 2010).It is characterized by spontaneous onset of shoulder pain accompanied by progressive limitation of both active and passive glenohumeral movement (Carette, et al., 2005).Adhesive capsulitis (frozen shoulder) is an insidious painful condition with gradual restriction of all planes of movement in the shoulder. It is the main cause of shoulder pain and stiffness. For this condition, the pain and stiffness can limit the ability to do simple everyday activities like getting dressed, brushing hair or reaching into a cabinet (Ludewig and Reynolds, 2009).

Most limitation of passive lateral rotation and abduction is the main character of capsular pattern and it helps for diagnosis of shoulder capsulitis (Magee, 2002). Maximum time non dominant extremity affected in case of adhesive capsulitis (Dias, et al., 2005). It has three stages. Stage one is called the freezing stage that lasts between 3 to 9 months and is characterized by an acute synovitis of the gleno-humeral joint. The second stage is called the frozen or transitional stage and lasts anywhere 4 to 12 months. The third stage begins when range of motion (ROM) begins to improve and is called the thawing stage. This stage lasts from 12 to 42 months and is defined by a gradual return of shoulder mobility (Manske and Prohaska, 2008).

Adhesive capsulitis can be due to idiopathic or post-traumatic causes but the term adhesive capsulitis should be reserved for the idiopathic type of shoulder stiffness. Factors associated with adhesive capsulitis include female gender, age older than 40 years, trauma, immobilization, diabetes, thyroid disease, stroke, myocardial infarction, and the presence of autoimmune diseases, cervical spine disorders and reflex sympathetic dystrophy syndrome (Ali and Ali, 2011).

Idiopathic (primary) adhesive capsulitis is characterized by fibrosis of the capsule resulting with progressive, painful loss of active and passive shoulder motion. It is related age, menopause, hand dominance, affected side, nature of onset, duration of symptoms and associated medical conditions (Johnson, et al., 2007). Secondary adhesive capsulitis is a result of a pre-existing shoulder condition such as dislocation, humeral fracture, osteoarthritis, a vascular necrosis, stroke or a neurological condition leading to muscular imbalance (Agarwal, et al., 2016; Johnson, et al., 2007)

Shoulder pain affecting 16 – 20 % of the general population and it is third most common musculoskeletal disorder among these complain of pain frozen shoulder is common (Ali, 2005). 2 to 5 percent of general people and 10 to 20 percent people with diabetics affected in adhesive capsulitis and age between 40 to 65 years (Kelley, et al., 2013). The most common in the co-morbid condition of diabetes mellitus with an incidence of 10-34% are estimated in the England (Griggs, et al., 2010). According to Center for the Disease Control and Prevention about 13.7 million people in the United States sought medical care in 2003 for shoulder problem (Thomas, et al., 2007). Frozen shoulder affects about 20% of people with diabetes and has been described as the most disabling of the common musculoskeletal manifestations of diabetes mellitus (Kordella, 2002).

In India 2 % of general population are incidences of frozen shoulder (Page and Labbe, 2010). Adhesive capsulitis affect in both shoulder in up to 16 % of patients (Contractor, et al., 2016). There is no relative study concerning about the health related quality of life of frozen shoulder in Bangladesh. However, reported prevalence of adhesive capsulitis for Bangladeshi male and female ratio is 1.8:1 and 11% of adhesive capsulitis among rheumatological diseases (Hasan, et al., 2009). A study was conducted to find out the prevalence of shoulder capsulitis among the patients undergoing Cardiothoracic Surgery among the respondents approximately 35% developed adhesive capsulitis. The prevalence of frozen shoulder was considerably higher among female than male and the diabetics than the non-diabetics (Uddin, et al., 2011). Earlier study was conducted on shoulder capsulitis as a postoperative complication of aneurysm surgery and the incidence of shoulder capsulitis was 70%. The surgery group had found highest incidence of shoulder capsulitis due to immobility of their upper extremity during post-operative

treatment (Tanishima, et al., 1997).The relationship between shoulder capsulitis and diabetes mellitus is well documented, with the incidence of shoulder capsulitis being two to four times higher in diabetics than in the general population (Neviaser and Hannafin, 2010). Slightly higher incidence rate present among women than men (Khan, et al., 2009).

The occurrence of one side frozen shoulder has the chance to the risk of contra lateral shoulder involvement by 5% to 34% and simultaneously bilateral shoulder involvement occurs often 14% of the time (Ludewig and Reynolds, 2009).

The treatment of frozen shoulder is lengthy and difficult for both patients and clinicians. Management of frozen shoulder has been attempted via many strategies, including joint mobilization, which improves tissue extensibility, increases the range of motion, modulates pain, reduces soft tissue swelling and inflammation, increases synovial fluid levels and stimulates peripheral mechanoreceptors (Kelley, et al., 2013). Manual therapy includes various joint mobilization and soft tissue manipulation techniques for adhesive capsulitis (Makwanaand and Shah, 2015).

As physiotherapy Intervention the traditional principles of treatment of adhesive capsulitis are to relieve pain, maintain range of motion and ultimately to restore function. The treatment of adhesive capsulitis by means of physiotherapy all along consists of different modalities (e.g., exercises, electrotherapy or massage) which may be applied side by side. Relief of pain may be achieved by massage, deep heat, ice, ultrasound, TENS (transcutaneous electrical nerve stimulation) and LASER (light amplification by stimulated emission of radiations) as described in our standard text books and other

literature concerning the treatment of adhesive capsulitis. However, they probably offer little benefit.

Mostly these applications are adjunct to other treatment modalities like mobilization techniques or home exercise program. Although adhesive capsulitis is generally considered to be a self-limiting condition that can be treated with physical therapy, to regain the normal extensibility of the shoulder capsule, passive stretching of the shoulder capsule in all planes of motion by means of mobilization techniques has been recommended. Grades I and II of Maitland mobilization techniques are primarily used for treating joints limited by pain. The oscillations may have an inhibitory effect on the perception of painful stimuli by repetitively stimulating mechanoreceptors that block nociceptive pathways at the spinal cord or brain stem levels. These non-stretch motions help move synovial fluid to improve nutrition to the cartilage whereas Grades III and IV are primarily used as stretching maneuvers. Appropriate selection of mobilization technique for treatment can only take place after a thorough assessment and examination (Arslan and Celiker, 2001).

Based on the theories of muscle imbalance, clinicians assume that releasing of tight soft tissue and strengthening of the posterior scapular stabilizers combined with stretching of the pectoral muscles can correct the scapula-humeral rhythm. Exercise protocol of rotator cuff and scapular retractors believe to restore the normal kinematics of gleno-humeral and scapulo-thoracic motion that plays an important role on Adhesive capsulitis or such conditions limiting normal shoulder kinesiology (Michener et al., 2004). End range mobilization with scapular mobilization is more effective in improving range and functioning as compared to end range mobilization alone for adhesive capsulitis.

(Sreenivasu, et al., 2016). So the aim of the study to find out the efficacy of myofascial release exercise around the scapular border for adhesive capsulitis in terms of decrease of pain, increase range of motion and improve functional activities.

1.2 Rational of the study:

The recovery period of adhesive capsulitis is lengthy and it is very difficult to management for both patients and physiotherapist (Kelley, et al., 2013). For reducing pain and disability physiotherapists used variety of interventions like different type of mobilizations, exercise, electrotherapy and home exercises etc (Phil and Andre, 2010).

Myofascial tightness and muscular adhesions contribute to prevention of necessary upward rotation and create a mechanical block of humeral elevation. These restrictions can be decreased or minimized by myofascial trigger release techniques. Myofascial trigger points are present in these specialized soft tissue restrictions, this prevent smooth musclecontraction throughout the length of the muscle. The myofascial release technique is a very effective manual therapy for release of trigger point and tight soft tissues. So there is a need for this study on Myofascial trigger point release technique. And this technique is effective in adhesive capsulitis of shoulder.

So far we know there is no studies have done to evaluate and find out the effect of MFR and Conventional Therapy in stage II adhesive capsulitis. Hence, the purpose of the study is to find out the effectiveness and comparison of MFR with Conventional therapy in stage II adhesive capsulitis.

1.3 Operational definition

Myofascial release (MFR), conventional physiotherapy and adhesive capsulitis

Myofascial technique

Myofascial Release is a specialised physical and manual therapy used for the effective treatment and rehabilitation of soft tissue and fascial tension and restrictions. ‘Myo’ means muscle and ‘fascia’ means band. Fascia, an embryological connective tissue, is a 3D continuous web of elastin and collagen fibers surrounded by a viscous fluid called the ground substance. These two fiber types allow it to be very strong yet have a high degree of flexibility whilst the ground substance is a fluid transportation medium and acts a slide and glide mechanism between structures.

Myofascial trigger point release

Scapular trigger point’s release: This technique is designed to mobilize myofascial restrictions on all three borders of the scapula. Medial boarder: to release trigger points between the scapula and thoracic spinous process (levator scapula and rhomboids), upper boarder: to release upper trapezius, lateral boarder: to release the infraspinatus.

Conventional therapy: Treatment that is widely accepted and used by most healthcare professionals. It is different from alternative or complementary therapies which are not widely used such as manual therapy, massage and electro physical agents.

Adhesive capsulitis: The term “capsulitis” or “frozen shoulder” refer to a common shoulder condition characterized by the global restriction in the shoulder range of motion in a capsular pattern and affecting many activities of daily living. The capsular pattern in the shoulder is characterized by the most limitation of passive lateral rotation and abduction (Cyrax, 1982and Kelley, et al., 2013).

1.4 Aims:

The aim of this study is to compare the effectiveness of the myofascial release along with conventional physiotherapy and only conventional physiotherapy on subjects with adhesive capsulitis to reduce pain, to improve the mobility and to improve the functional ability.

1.4.1 General objectives:

To determine and compare the effectiveness between myofascial release exercise along with conventional physiotherapy and only conventional physiotherapy on patient with adhesive capsulitis at shoulder joints.

1.4.2 Specific Objectives:

2. To find out the socio demographic characteristics, pain and other related information.
3. To evaluate the effectiveness of myofascial release techniques for reducing pain and improving functional activity and ROM on patients with adhesive capsulitis at shoulder.
4. To determine the effectiveness of conventional physiotherapy for reducing pain and improving functional activity and ROM on patients with adhesive capsulitis at shoulder.
5. To compare the effectiveness of myofascial release techniques with conventional physiotherapy and only conventional physiotherapy reducing pain and improving functional activity& ROM in patients with adhesive capsulitis of shoulder.

1.3 Hypothesis:

Null hypothesis (H_0): Only conventional physiotherapy for Adhesive capsulitis patient (μ_1) is same as the myofascial release technique (MFR) alone with conventional Physiotherapy (μ_2), i. e. **$H_0: \mu_1 - \mu_2 = 0$**

Alternative Hypothesis: H_a : That means myofascial release technique along with conventional physiotherapy (μ_2) is more effective then only conventional physiotherapy (μ_1) for adhesive capsulitis patients. i. e. **$H_a: \mu_1 < \mu_2$** .

Here,

H_0 = Null hypothesis

H_a = Alternative hypothesis

μ_1 = Conventional physiotherapy

μ_2 = Myofascial release technique (MFR) alone with conventional Physiotherapy

1.1 List of variables

Respondent Variables	Response Variables
<ul style="list-style-type: none">• Demography of Participants• Myofascial release technique (MFR)• Conventional Physiotherapy	<ul style="list-style-type: none">• Pain• Range of motion (ROM)• Disability

Adhesive capsulitis is a clinical diagnosis made from a history of the gradual onset of severe shoulder pain with the progressive limitation of active and passive glenohumeral movements (Ombregt, et al., 2003). In research report Johnson, et al. (2007) mentioned that frozen shoulder or primary adhesive capsulitis is an insidious onset of painful stiffness of the glenohumeral joint of shoulder girdle. On the other hand secondary adhesive capsulitis is associated with other conditions of the shoulder like humerus fracture, shoulder dislocation, a vascular necrosis, osteoarthritis or stroke. The prevalence of primary adhesive capsulitis affects from 2% to 3% of the general population. They also noted the main cause of shoulder pain and dysfunction in person aged in between 40 to 70 years. The preliminary causes of primary adhesive capsulitis is related to age, menopause, hand dominance, affected side, nature of onset, duration of symptoms, or associated medical conditions.

The mechanism of adhesive capsulitis is not clearly understood. It is more common in those over forty, women, in diabetics and who suffer from a stroke, thyroid disease, recent surgery and Parkinson disease etc.

Adhesive capsulitis is classified into two categories: number one is primary adhesive capsulitis which is insidious and idiopathic, onset of symptoms gradually progress without any identifiable causes. Number two is secondary adhesive capsulitis, which is generally due to trauma or subsequent immobilization, surgery or illness (Malone and Hazle, 2008).

Adhesive capsulitis may appear on the secondary to other diseases such as diabetes and hypothyroidism. It occurs distinctly in three phases: hyperalgesia, freezing and defreezing. However, its resolution can range from two to seven years. By presenting a chronic course and unwieldy treatment, this condition affects both shoulder function for daily living activities, compromising the quality of life (QOL) of patients (Fernandes, 2015). Adhesive capsulitis is a common in type I and type II diabetic patients. Non-insulin dependent diabetics also have an increased incidence of frozen shoulder, but not as high as insulin users (Gupta, et al., 2008).

The aetiology of frozen shoulder remains unclear. The disease process particularly affects the antero-superior joint capsule and the coracohumeral ligament. Arthroscopy shows a small joint with loss of the axillary fold and tight anterior capsule, mild or moderate synovitis, and no adhesions. Evidence shows a synovial inflammation with subsequent reactive capsular fibrosis. A dense matrix of type I and type III collagen is laid down by fibroblasts and myofibroblasts in the joint capsule. Subsequently, this tissue contracts (Dias, et al., 2005).

Frozen shoulders have three distinct stages of progression. Each stage typically takes months to progress. The normal progression of adhesive capsulitis all three stages are between six months and two years. Without a purposeful effort to restore motion the effect of this condition may become permanent. Pain full stage: Shoulder pain is the hallmark of this stage. It starts gradually and progressively worsens. Frozen stage: Pain may be reducing in this stage, although shoulder stiffness and restriction increase. Shoulder range of motion is dramatically reduced. Thawing stage: This stage is

characterized by spontaneous “thawing”. The motion will gradually increase and the shoulder will be more responsive to stretching exercise and treatment.

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 pathological process of adhesive capsulitis in which the body forms excessive scar tissue or adhesions across the glenohumeral joint and underlying the inflammatory that leads to fibrotic changes in the capsule or adjacent bursa. And final manifests are pain, stiffness and dysfunction of shoulder joints (Neviaser and Neviaser,2011).

Buchbinder and Green (2004) mentioned that there are some primary risk factors responsible for adhesive capsulitis that are diabetics mellitus, thyroid disorder, history of trauma, post operative immobilization, shoulder surgery, Parkinson’s disease, hyperparathyroidism and inflammatory/autoimmune reaction etc. It occur more often in the non dominant shoulder, it is more prevalent in women and occurs most often in people between the ages of 40 and 70 years.

Adhesive capsulitis of shoulder or frozen shoulder's clinical diagnosis is made on medical history and physical exam of patients. Other causes of a painful stiff shoulder should be excluded before a confirm diagnosis of adhesive capsulitis. That would be fracture, septic arthritis, mal-position of orthopedic hardware, fracture mal-union, rotator cuff pathology, glenohumeral arthrosis or cervical radiculopathy and osteoarthritis etc. Clinically, patients give information that pain gradually increases loss of both active and passive range of motion (AROM & PROM) of glenohumeral joints and along with restriction of scapulothoracic motion (Neviaser and Neviaser, 2011). The majority of patients (90.6%) reported developing shoulder pain before loss of motion. External rotation is often the first motion affected on clinical examination, with steady global loss of ROM with disease progression. Pain is generally worse at the extremes of motion, when the contracted capsule is stretched. Passive ROM is lost with firm painful endpoints of motion, suggesting a mechanical rather than a pain-related restriction to motion (Boyle-Walker, 1997)

The most fundamental component of treating of adhesive capsulitis is movement. Immobility worsens the conditions. The most common treatments are mobility exercises and anti-inflammatory drugs. Manipulation of shoulder, steroid injections and some time manipulation under anesthesia are also indicated for adhesive capsulitis.

The primary treatment for frozen shoulder is stretching. Other treatment include the use of non steroidal anti-inflammatory drugs (NSAIDs) like ibuprofen or aspirin, corticosteroid injection into the affected shoulder, manipulation, mobilization, friction massage and therapeutic modalities. In persistent case, manipulation under anesthesia or surgery are required to restore shoulder motion. The possibility of least risk treatment to

high risk treatment for this condition are given chronologically motion restoring exercise, mobilization exercise, myofascial release techniques, manipulation, steroid injections, manipulation under anesthesia and surgery.

The treatment and recovery period of adhesive capsulitis is lengthy and it is very difficult to management for both patients and physiotherapist For reducing pain and disability physiotherapists used a variety of intervention which includes exercise and electrotherapy along with different types of mobilizations. Now a day mobilization has become an integral part of treating Adhesive capsulitis (Kelley, et al., 2009). Mobilization techniques have recommended for regaining the normal extensibility of the shoulder capsule and tight soft tissues. Maitland mobilizations techniques of Grade 1 and also the grade 2 are of primarily used if joint limitations occur by the result of pain for treating this condition. There were midrange mobilization (MRM), end range mobilization (ERM) and mobilization with movement (MWM) techniques have been advocated by Maitland, Kaltenborn and Mulligan. In addition few studies have described the use of these techniques in patients with Adhesive capsulitis (Nath, 2015). Manual therapy includes various joint mobilization and soft tissue manipulation techniques for adhesive capsulitis (Shah, 2015).

A recent RCT study conducted by Agarwal, et al. (2016) with the aim to compare the effect of two different mobilization technique in the management of patient with adhesive capsulitis. Group 1 (Maitland) glenohumeral distraction at various angles of abduction and flexion also scapula mobilization in medial and downward rotation. Doses were 10 to 15 repetitions in direction each for 3 sessions per week for 6 weeks. Group 2 (Kaltenborn) caudal and posterior glides stretch mobilization technique were use grade

III and IV glide without giving any oscillatory stretch for 1 minute a total of 15 minutes of sustain stretch along with conventional physiotherapy. The result both groups were good but Kaltenborn mobilization method conventionally usually not used in patients with adhesive capsulitis.

Maitland versus Mulligan mobilization in idiopathic adhesive capsulitis of shoulder study conducted by Arshad, et al. (2015) and that was an experimental study. Maitland's mobilization was treated with Maitland mobilization techniques and supervised exercises. The position of Maitland mobilization was supine with arm abducted to 30 degrees, lateral humeral distraction in its mid range position and the glenohumeral caudal glide mobilization was given and in prone position at end range of abduction and external rotation lateral humeral distraction had given stretch mobilizations. Treatment doses was 2-3 glides per second for 30 sec in 1 set for 5 sets. 3 days per week for 4 weeks. It was used for improving external rotation and abduction. Mulligan mobilization group, MWM technique was performed with belt for glide the humerus head appropriately in the posterolateral direction. Treatment doses were 10 repetitions in 1 set for 3 sets and 30 sec rest between sets. Total 3 sessions per week for 4 weeks. Both groups used conventional therapy that was pulley exercises, pendulum exercises, back climbing exercises, finger ladder exercise and circumduction exercises. Treatment doses of all exercises were 5 to 10 repetitions. The study result was after 4 weeks in both group improved significantly but when comparing between two groups Mulligan mobilization group have shown greater statistical significance than Maitland mobilization..

A comparative study was done exercise with mobilization therapy and only exercises therapy for adhesive capsulitis conducted by Ali and Khan (2015). Group I received

general exercise and Maitland mobilization on glenohumeral joint in grade II & III. These technique applied postero–anterior (PA), antero–posterior (AP) direction. And inferior caudal glides with 2 to 3 oscillations in a second for 30 seconds. Group II, only exercises consists of flexion, abduction, internal rotation and cross over arm stretches with and without towel and pendulum exercises. Both group treatment sessions lasted 45 minutes including manual mobilization technique and general exercises. Total 3 days in a week for 5 weeks. Result was Maitland mobilization on glenohumeral joint along with general exercises for duration of 45 minutes with 15 sessions are effective for adhesive capsulities in case of reducing pain, improving range of motion and disability index.

Maitland joint mobilization combined with stretching exercises is more effective than stretching exercises alone in term of external rotation , abduction range of motion and function score(Celik and Mutlu, 2016). Joint mobilization and stretching was in group I and only stretching was in group II. Both groups performed same home exercises that were self stretching, wall and table push up, scapular adduction in prone position.

Maitland end range mobilization is better improvement than stretching exercises in case of acute stage of adhesive capsulitis (Panchal and Eap, 2015). It was a randomized double blind study. Group I received moist heat and shoulder stretching exercises whereas group II received end range mobilization. End range mobilization was 10- 15 repetitions in flexion, abduction, internal rotation and external rotation positions with interferential current therapy. The results showed that improvement in pain severity and disability was similar with both the treatments. But end range mobilization could be better improvement in range of motion in acute stage of frozen shoulder.

End range mobilization with scapular mobilization is more effective in improving range and functioning as compared to end range mobilization alone for adhesive capsulitis. (Sreenivasu, et al., 2016). It was a RCT study. In group I used both end range mobilization and scapular mobilization technique. Group II used end range mobilization only. Treatment session was 30 minutes a day 4 days a week for 4 weeks.

Mobilization techniques are important to regain the normal extensibility of the shoulder joint and shoulder girdle (scapular border) tight soft tissue. So that use of intensive mobilization (myofascial release technique) may help to decrease the risk of further stiffness of the joint and contracture progression in patients with adhesive capsulitis.

The Shoulder Pain and Disability Index (SPADI) have developed to measure current shoulder pain and disability in an outpatient setting. The SPADI contains 13 items that assess two domains; a 5-item subscale that measures pain and an 8-item subscale that measures disability. There are two versions of the SPADI; the original version has each item scored on a visual analogue scale (VAS) and a second version has items scored on a numerical rating scale (NRS). Both versions take 05 (five) to 10 (ten) minutes to complete the questionnaire (Beaton, et al., 1996 and Williams, et al., 1995). The SPADI has since been used in both primary care on mixed diagnosis (Beaton, et al., 1996 and MacDermaid, et al., 2006) and surgical patient populations including rotator cuff disease (Ekeberg, et al., 2008), osteoarthritis and rheumatoid arthritis (Christie, et al., 2010), adhesive capsulitis (Staples, et al. 2010 and Tveita, et al., 2008) and joint replacement surgery (Angst, et al., 2007).

Scoring instructions; to answer the questions, patients place a mark on a 10cm pain numeric rating scale for each question. Verbal instruction give to patients for the pain dimension are ‘no pain at all’ and ‘worst pain imaginable’ and those for the functional activities are ‘no difficulty’ and ‘so difficult it required help’. The scores from both dimensions are averaged to derive a total score.

Reliability and validity of the SPADI in the original description was poor, with an intraclass correlation coefficient (ICC) of 0.66. A more recent systematic review has found reliability coefficients of $ICC \geq 0.89$ in a variety of patient populations (Roy, et al., 2009). Internal consistency is high with Cronbach α typically exceeding 0.90 (Hill, et al., 2011). The SPADI demonstrates good construct validity, correlating well with other region specific shoulder questionnaires. It has been shown to be responsive to change over time, in a variety of patient populations and is able to discriminate adequately between patients with improving and deteriorating conditions (Roy, et al., 2009).

Numeric rating scale for pain is a unidimensional measure of pain intensity in adults with chronic pain due to rheumatic diseases. In this scale most commonly used 11-items (Farrar, et al., 2001). 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 their pain (Rodriguez, 2001). The common format is a horizontal bar or line and it is similar to the pain VAS. The NRS is anchored by terms describing the severity of pain. The pain NPRS is a single 11-point numeric scale (Johnson, 2005). An 11-point numeric scale 0 (zero) representing ‘no pain’ and 10 (ten) representing ‘extreme pain’ or pain as bad as you can imagine or worst pain imaginable (Jensen and McFarland,

1993). In additionally commonly asked to participants to report pain intensity in the last 24 hours or average pain intensity (Dworkin, et al., 2005).

The NRS can be administered verbally or graphically for self-completion. The respondent is asked to indicate the numeric value on the marked scale that best describes their pain intensity. The number given on scale by the respondent and it indicates of their rate of pain intensity. Keep it in recorded. Its scores range from 0–10. Score interpretation is higher scores indicate greater pain intensity. Chronic pain patients prefer the NRS over other measures of pain intensity, including the pain VAS, due to comprehensibility and ease of completion (De C Williams, et al., 2000).

High test–retest reliability has been observed in both literate and illiterate patients with rheumatoid arthritis or rheumatologic conditions ($r = 0.96$ and 0.95 , respectively) before and after medical consultation. For construct validity, the NRS was shown to be highly correlated to the VAS in patients with rheumatic and other chronic pain conditions (pain < 6 months): correlations range from 0.86 to 0.95 (Ferraz, et al., 1990)

In this study researcher used Goniometer for measuring (in degrees) the range of movement of shoulder abduction, lateral rotation and medial rotation. It is a plastic and 41cm of universal goniometer. The subject was positioned as for visual estimation tests. The subject moved the affected extremity (thumb pointing upwards) to the end of active range of shoulder flexion, abduction and external rotation (0 degrees glenohumeral joint abduction, 90degrees elbow flexion, neutral supination/pronation forearm position). The Goniometer is a simple and accurate way of objective assessment of ROM (Hayes, et al., 2001).

3.1 Study design

It was Randomized Controlled Trail (RCT) because the experimental study is the best way to find out the effectiveness of the study. This is an experiment between different subject designs. A random sampling technique was used to two different groups of subjects, single blinding was used.

3.2 Study area

The study was conducted in musculoskeletal Physiotherapy unit of the Centre for the Rehabilitation of the Paralyzed (CRP), Savar, Dhaka and musculoskeletal Physiotherapy unit of the Centre for the Rehabilitation of the Paralyzed (CRP), Mirpur, Dhaka. Patients came at CRP from all over the Bangladesh from all economic groups, so it we may assume that this study with reflect the entire population.

3.3 Study population

Study would be conducted among adult of both sexes (40 to 70 years of age group) from the CRP outdoor department. 30 subjects were recruited with stage II Adhesive Capsulitis from 15 January 2018 to 15 March 2018.

3.4 Study period

Approximately 10 months (August 2017 to June 2018) were required for completion of the study.

3.5 Sampling technique

Patients with adhesive capsulitis who were attendant at CRP Savar and Mirpur branch from January 15 to March 15, 2018 were selected in two groups (experimental and control groups). Researcher randomly selected two groups by toss, the odd number goes for control group and even number goes samples for experimental group. 15 patients in experimental group allocated for myofascial release and conventional physiotherapy and remaining 15 patients in the control group for only conventional physiotherapy. ‘ Random assignment improves internal validity of experimental research’ (Hicks, 2009). The samples were given numerical number C1, C2, C3 etc. for the control group and E1, E2, E3 etc. for experimental group.

3.6 Inclusion Criteria

- Subjects primary or idiopathic unilateral adhesive capsulitis with stage-II (Agarwal , et al., 2016).
- Shoulder pain with 3 months duration without any major trauma. Restriction of active and passive Glenohumeral and scapula thoracic joint movements for at least three month duration (Thomas, et al., 2007).
- Both males and females were within age group of 40 to 65 years. This is most prevalence age for adhesive capsulitis. (Kelley, et al., 2013). Both genders involve but slightly higher incidence rate present among women than men (Khan, et al., 2009and Uddin, et al., 2011).
- Adhesive Capsulitis subjects with limited Range of motion of shoulder abduction, external rotation and flexion (Kelley, et al., 2013).

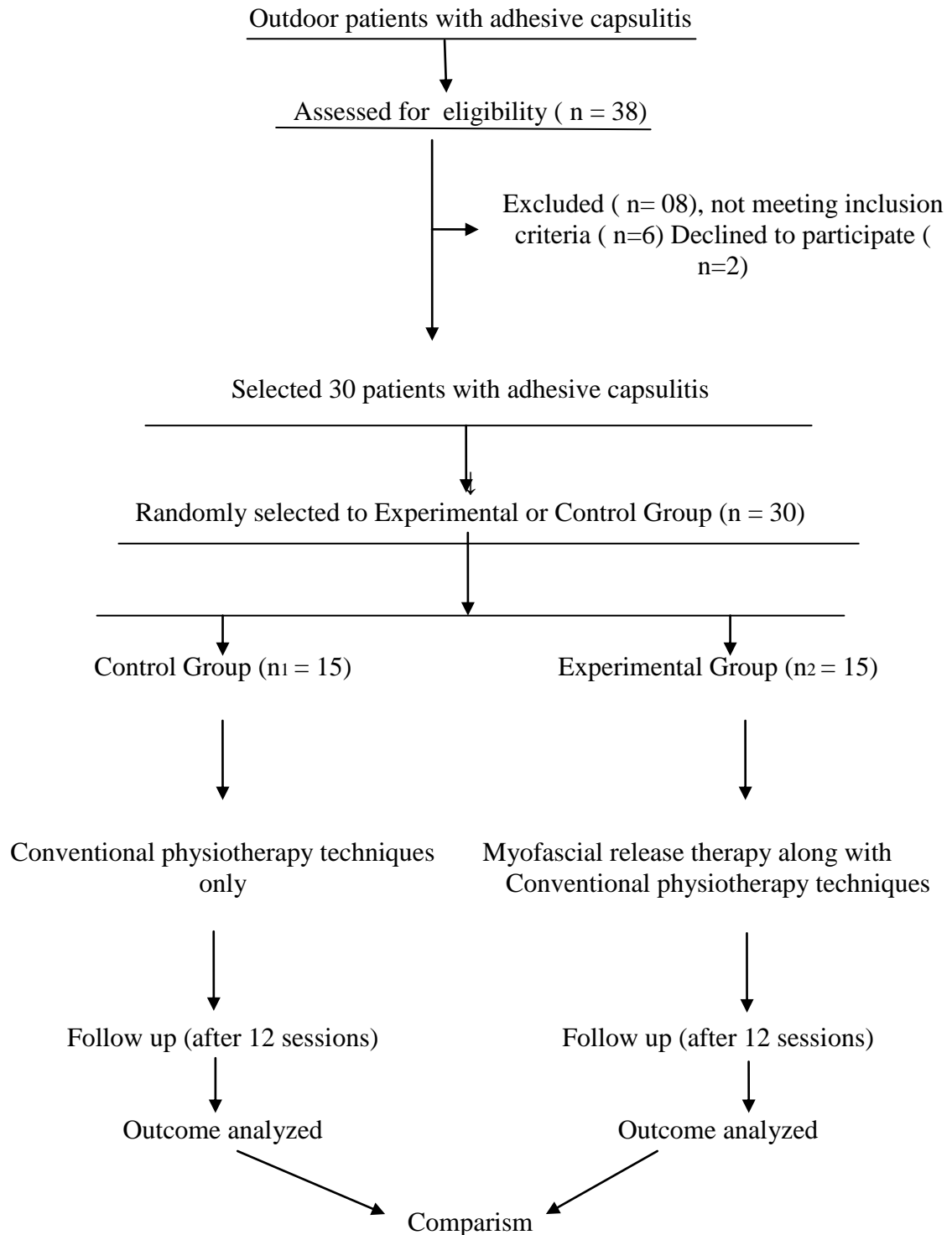
- Physical special test positive like LAM test. Most limitation of passive lateral rotation, abduction and medial rotation helps for diagnosis of shoulder capsulitis (Magee, 2002).
- Normal finding in the X-ray at Glenohumeral joint (Johnson, et al., 2007).
- Subjects who were willing to participate in the study. Included percipients provided written consent form and might be helpful or might not leave during the study (Gautam, et al., 2014).

3.7 Exclusion Criteria

- Subjects with Rotator cuff tears, labral tears, other shoulder ligament injuries, Peri-arthritis shoulder secondary to fracture and dislocation, unhealed fractures and implants in the shoulder region. There have chance to develop secondary adhesive capsulitis and need other medical management (Agarwal, et al., 2016).
- History of any arthritis related to shoulder joints like osteoarthritis and rheumatoid arthritis and osteoporosis in the shoulder region, reflex sympathetic dystrophy, neurological disorder Stroke with residual upper limb involvement.(Johnson, et al., 2007and Yang, et al., 2012).
- Subject had disorder of cervical spine, elbow, wrist or hand and any other pathology or malignancy (Yang, et al., 2012).
- Subject had taken cortico steroid injections in the affected shoulder taken 1 month before study and manipulation under anesthesia (Johnson, et al., 2007)

3.8 Method of data collection

Flow-chart of the phases of Randomized Controlled Trial



3.9 Sample size

It was 30 and in following way

- Both male and female between 40 -70 years of age group
- Group A= 15
- Group B = 15

3.10 Data collection Materials

Data collection tools were data collection form, informed consent form, structured questionnaire, papers, pen, pencil and file cover etc.

3.11 Measurement tools

To conduct this study, researcher collected data through using different types of data collection tools.

- Pain measured with Pain Numeric Rating Scale (PNRS).
- Range of motion of shoulder joint with goniometry
- Functional status measured by Shoulder Pain and Disability Index (SPADI) scale.

3.11.1 Numeric Pain Rating Scale (PNRS)

The Numeric Pain Rating Scale(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 their pain (Rodriguez, 2001). The common format is a horizontal bar or line and it is similar to the pain VAS. The NRS is anchored by terms

describing the severity of pain. The pain NPRS is a single 11-point numeric scale (Johnson, 2005). An 11-point numeric scale 0 (zero) representing 'no pain' and 10 (ten) representing 'extreme pain' or pain as bad as you can imagine or worst pain imaginable (Jensen and McFarland, 1993). In addition commonly asked to participants to report pain intensity in the last 24 hours or average pain intensity (Dworkin, et al., 2005). The NRS can be administered verbally or graphically for self-completion. The respondent is asked to indicate the numeric value on the marked scale that best describes their pain intensity. The number given on scale by the respondent and it indicates of their rate of pain intensity. Keep it in recorded. Its scores range from 0–10. Score interpretation is higher scores indicate greater pain intensity.

3.11.2 Shoulder Pain and Disability Index (SPADI) scale

The Shoulder Pain and Disability Index (SPADI) have developed to measure current shoulder pain and disability in an outpatient setting. The SPADI contains 13 items that assess two domains; a 5-item subscale that measures pain and an 8-item subscale that measures disability. There are two versions of the SPADI; the original version has each item scored on a visual analogue scale (VAS) and a second version has items scored on a numerical rating scale (NRS). Both versions take 05 (five) to 10 (ten) minutes to complete the questionnaire (Beaton, et al., 1996 and Williams, et al., 1995).

Scoring instructions; to answer the questions, patients place a mark on a 10cm pain numeric rating scale for each question. Verbal instruction give to patients for the pain dimension are 'no pain at all' and 'worst pain imaginable' and those for the functional

activities are 'no difficulty' and 'so difficult it required help'. The scores from both dimensions are averaged to derive a total score.

3.11.3 Goniometer

Goniometer used for measuring (in degrees) the range of movement of shoulder abduction, lateral rotation and medial rotation. It is a plastic and 41cm of universal goniometer. The subject was positioned as for visual estimation tests. The subject moved the affected extremity (thumb pointing upwards) to the end of active range of shoulder flexion, abduction and external rotation (0 degrees glenohumeral joint abduction, 90degrees elbow flexion, neutral supination/pronation forearm position). The Goniometer is a simple and accurate way of objective assessment of ROM (Hayes, et al., 2001).

3.12 Data collection procedure

The assessor collect data through a close ended structural questionnaire, face to face interviews and assessing the patient, initial recording, treatment and final recording. After randomization the patient access by a qualified physiotherapist in that time assessor collect pre test data. Pre-test was performed before beginning the treatment and the intensity of pain was noted with Numeric Pain Rating Scale (NPRS), range of motion measured by goniometer and disability measured by Shoulder Pain and Disability Index (SPADI) scale. Before starting treatment session every qualified physiotherapist were given training about treatment protocol. Total 12 sessions of treatment were provided for each participant. After completion of 12 session treatment, post test data were taken. Both pre test and post test data was collected by using a written questionnaire form (Appendix) which was formulated by the researcher. Questionnaires were used both in English and Bengal for easy understanding of the participants.

3.12 Intervention

Initially collected the list of qualified physiotherapists from CRP musculoskeletal unit of Savar and Mirpur branch. Total 12 qualified physiotherapists were selected out of 23. Protocol of conventional physiotherapy was obtained from head of Physiotherapy Department, Centre for the rehabilitation of the paralysed (CRP) (Appendix- F). The researchers arranged special training about the myofascial release technique (MFR) protocol with type of exercise, dose and treatment duration. The experimental group receives myofascial release technique (MFR) exercise with conventional therapy and control group receive only conventional therapy.

3.13 Data analysis

Data were analyzed by using SPSS version 16.00 to compute the descriptive statistics using pie chart, bar chart, and percentage. Between group analyses of pain, range of motion and disability has been compared by using *t*-test. Within group of pain, range of motion and disability were checked by paired *t* test.

The researcher had calculated the variables mean, mean difference, standard deviations, standard error, degree of freedom and to show the significant level. Within group analysis the difference between the calculated value and standard table value for confine the significance. For tested mean variables used paired *t* test, where degree of freedom (df) was 14. Between group analyses, compare the mean difference between post test result of control and experimental groups. And compare the calculated value and standard table value to show the significant level with the used of unpaired *t* test, where degree of freedom (df) was 28.

Estimated predictor

Hypothesis test of mean difference between the experimental group and the control group, within groups and also between groups, assuming normal distribution of the population, two different and or independent variables, variables were quantitative by estimated predictor of paired *t*-test or unrelated *t*-test.

Hypothesis test

Paired t test

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

Assumption

Paired variables

Variables were quantitative

Sample observations follow normal distribution

Null and alternative hypothesis

Null hypothesis (*H₀*): Only conventional physiotherapy for Adhesive capsulitis patient (μ_1) is same as the myofascial release technique (MFR) alone with conventional Physiotherapy (μ_2), i. e. ***H₀*: $\mu_1 - \mu_2 = 0$**

Alternative Hypothesis: *H_a*: That means myofascial release technique along with conventional physiotherapy (μ_2) is more effective then only conventional physiotherapy (μ_1) for adhesive capsulitis patients. i. e. ***H_a*: $\mu_1 < \mu_2$.**

Here,

H_0 = Null hypothesis

H_a = Alternative hypothesis

μ_1 = Conventional physiotherapy

μ_2 = Myofascial release technique (MFR) alone with conventional Physiotherapy

Formula:

Paired t test as follows:

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

Where,

\bar{d} = is the mean of difference not different of mean,

$Se(\bar{d})$ = is the standard deviation of differences.

SD= standard deviation of the differences d and

n = number of paired observations.

Calculation of paired t value of the general pain intensity as below-

$$t = \frac{d}{SE(\bar{d})} = \frac{d}{\frac{SD}{\sqrt{n}}} = \frac{2.4}{\frac{1.298}{\sqrt{15}}}$$

$$t = 7.164$$

In this way researcher has calculated all the t - value and significant level have presented in the following tables.

Within group analysis (Paired *t* test):

Researcher had calculated paired *t*-test and significant level and have presented in the following tables-

Table 3.1: Numeric Rating Scale for Pain (Initial and final assessment – Paired *t* test)

Variables	Experimental		df	Control	
	t	p		t	p
Numeric Pain Rating Scale for pain	7.159	.000	14	10.990	.000

Above tables 3.1 shows that pain intensity of adhesive capsulitis significantly decrease in both groups (control and experimental) that mean myofascial release technique (MFR) along with conventional therapy significantly decrease pain intensity in experimental group and similarly significantly decrease pain in control group that are receive only conventional physiotherapy.

Table 3.2: Range of Motion of shoulder girdle (Initial and final assessment – Paired t test)

SL	Variables	Experimental		df	Control	
		t	p		t	p
Pair 2	Active forward elevation (maximum arm trunk angle)	4.180	.001	14	5.245	.000
Pair 3	Passive forward elevation (maximum arm trunk angle)	4.583	.000	14	3.162	.007
Pair 4	Active external rotation arm comfortable at site	4.012	.001	14	6.481	.000
Pair 5	Passive external rotation arm comfortable at site	3.850	.002	14	6.546	.000
Pair 6	Active external rotation (arm at 90 abduction)	4.731	.000	14	4.766	.000
Pair 7	Passive external rotation (arm at 90 abduction)	2.120	.052	14	4.561	.000
Pair 8	Active internal rotation (highest posterior anatomy reached with thumb)	3.274	.006	14	7.483	.000
Pair 9	Passive internal rotation (highest posterior anatomy reached with thumb)	3.248	.006	14	6.949	.000
Pair 10	Active cross body adduction (anticubital fossa to opposite accrominion)	3.833	.002	14	5.237	.000
Pair 11	Passive cross body adduction (anticubital fossa to opposite accrominion)	3.300	.005	14	4.968	.000

Above this table 3.2 shows that pre test and post test result within groups(control group and experimental group); active range of motion (AROM) and passive range of motion (PROM) of shoulder girdle significant increase in both groups.

Table 3.3: Range of Motion of shoulder joints (Initial and final assessment – Paired t test)

SL	Variables	Experimental		df	Control	
		t	p		t	p
Pair 12	Active flexion of shoulder joint	5.537	.000	14	6.081	.000
Pair 13	Passive flexion of shoulder joint	5.458	.000	14	5.832	.000
Pair 14	Active extension of shoulder joint	3.371	.005	14	4.010	.001
Pair 15	Passive extension of shoulder joint	2.347	.034	14	2.703	.017
Pair 16	Active abduction of shoulder	4.45	.001	14	5.298	.000
Pair 17	Passive abduction of shoulder	4.30	.001	14	4.468	.001
Pair 18	Active adduction of shoulder	.000	1.000	14	3.500	.004
Pair 19	Passive adduction of shoulder	.857	.408	14	4.468	.001
Pair 20	Active medial rotation of shoulder	4.85	.000	14	5.551	.000
Pair 21	Passive medial rotation of shoulder	5.186	.000	14	4.711	.000
Pair 22	Active lateral rotation of shoulder	5.488	.000	14	5.500	.000
Pair 23	Passive lateral rotation of shoulder	5.372	.000	14	5.884	.000

Above this table 3.3 shows that pre test and post test result within groups(control group and experimental group); active range of motion (AROM) and passive range of motion (PROM) of glanuhumeral joints significant increase in both groups.

Table 3.4: Shoulder Pain and Disability Index questionnaire (Initial and final assessment – Paired t test)

SL	Variables	Experimental		df	Control	
		t	p		t	p
Pair 24	Pain scale on SPADI	5.820	.000	14	5.892	.000
Pair 25	Functional difficulty on SPADI	6.461	.000	14	5.337	.000
Pair 26	Total SPADI score	5.73	.000	14	5.389	.000
Pair 27	Sum of pain on SPADI	5.77	.000	14	6.386	.000
Pair 28	Sum of function on SPADI	6.211	.000	14	6.174	.000

Above this table 3.4 shows that significant improvement in pain and functional disability in both experimental and control groups. Participant can lying on the involve side, reaching for something on a high shelf, touching back, pushing involve arm and placing an object on a high shelf due decrease pain after physiotherapy treatment. In term of functional ability, participant can washing their hair, washing back, putting on dress, shirt, pants, placing object on a high shelf, carrying heavy object above 5 kg and removing something from back pocket etc.

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 were quantitative

Normal distribution of the variables

Formula: test 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.

Calculation unpaired t test value for general pain intensity:

$$\begin{aligned} \text{Where, } S &= \sqrt{\frac{\sum(\bar{x}_{E-x_1})^2 + \sum(\bar{x}_{C-x_2})^2}{|n^1+n_2|-2}} = \sqrt{\frac{\sum(4.07_{-2})^2 + \sum(4.20_{-2})^2}{|15+15|-2}} \\ &= \sqrt{\frac{4.28 + 4.48}{28}} = 0.57 \end{aligned}$$

Here,

\bar{x}_E = Mean of the experimental Group

\bar{x}_C = Mean of the control group

X_1 = Individual value of the experimental group

X_2 = Individual value of the control group

n_1 = Number of participants in the experimental group

n_2 = Number of participants in the control group

$$t = \frac{\bar{X}_1 - \bar{X}_2}{s \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} = \frac{2.40 - 2.26}{0.57 \sqrt{\frac{1}{15} + \frac{1}{5}}} \frac{.14}{0.57 \times 1.158} = \frac{0.14}{0.66}$$

$$t = 0.213$$

In this way researcher has calculated all the t- value and significant level have presented in the following tables.

Between group analyses (unpaired *t* test):

Comparing post test of both groups in the following variables through independent *t* test.

Table 3.5: NPRS and ROM of shoulder girdle (unpaired *t* test)

SL	Variables	t	df	p
Pair 1	Numeric Pain Rating Scale for pain	.214	28	.832
Pair 2	Active forward elevation (maximum arm trunk angle)	.642	28	.526
Pair 3	Passive forward elevation (maximum arm trunk angle)	.592	28	.559
Pair 4	Active external rotation arm comfortable at site	1.167	28	.253
Pair 5	Passive external rotation arm comfortable at site	1.331	28	.194
Pair 6	Active external rotation (arm at 90 abduction)	.907	28	.372
Pair 7	Passive external rotation (arm at 90 abduction)	1.357	28	.186
Pair 8	Active internal rotation (highest posterior anatomy reached with thumb)	1.235	28	.227
Pair 9	Passive internal rotation (highest posterior anatomy reached with thumb)	1.757	28	.090
Pair 10	Active cross body adduction (anticubital fossa to opposite acrominion)	1.351	28	.188
Pair 11	Passive cross body adduction (anticubital fossa to opposite acrominion)	1.919	28	.065

Above this table 3.5 shows that between group analysis in experimental and control groups of post test result have found majority are not significant that means active and passive range of movement of shoulder girdle not significant improvement during post test analysis.

Table 3.6: ROM of shoulder joint (unpaired *t* test)

SL	Variables	t	df	p
Pair 12	Active flexion of shoulder joint	.483	28	.633
Pair 13	Passive flexion of shoulder joint	.907	28	.372
Pair 14	Active extension of shoulder joint	1.119	28	.273
Pair 15	Passive extension of shoulder joint	1.083	28	.288
Pair 16	Active abduction of shoulder	.399	28	.693
Pair 17	Passive abduction of shoulder	.753	28	.458
Pair 18	Active adduction of shoulder	2.095	28	.045
Pair 19	Passive adduction of shoulder	2.040	28	.051
Pair 20	Active medial rotation of shoulder	.053	28	.958
Pair 21	Passive medial rotation of shoulder	.104	28	.918
Pair 22	Active lateral rotation of shoulder	.507	28	.616
Pair 23	Passive lateral rotation of shoulder	.327	28	.746

Above this table 3.6 shows that between group analysis in experimental and control groups of post test result have found majority are not significant that means active and passive range of movement of shoulder joint not significant improvement during post test analysis.

Table 3.7: Functional disability on SPADI scale (unpaired *t* test)

SL	Variables	t	df	p
Pair 24	Pain scale on SPADI	.621	28	.539
Pair 25	Functional difficulty on SPADI	.724	28	.475
Pair 26	Total SPADI score	.270	28	.789
Pair 27	Sum of pain on SPADI	.622	28	.539
Pair 28	Sum of function on SPADI	1.002	28	.325

Above this table 3.7 shows that between group analysis in experimental and control groups of post test result have found majority are not significant that means pain intensity and functional disability not significant improvement during between group analyses.

3.14 Level of significance:

In order to find out the significance of the study the “p” value was calculated. The p value refers to the probability of the result 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 (DePoy and Gitlin, 2015).

3.15 Quality control and assurance

The investigator had enough knowledge in the designated study, hence the study area and underneath issues had been keenly explored by him. The format of the questionnaire was purely structural, thus it enabled a definitive answer. The questionnaire was developed according to the literature search; follow the international accepted questionnaire and

peer reviewed for reliable questionnaire. The investigator tried to avoid selection bias due to strictly maintained inclusion and exclusion criteria. The study was avoided conflict the selection of the participants. The data was collected by experience physiotherapist who was identified adhesive capsulitis patients as participants.

3.16 Ethical considerations:

- Researcher would take permission from the research panel committee in M. Sc. in Physiotherapy program of Bangladesh Health Profession Institute (BHPI).
- Researcher will maintain and preserve all ethical issues among the participants.
- The proposal of the dissertation including methodology was presented to the Institutional Review Board (IRB). Then the proposal of the dissertation including methodology was approved and obtained permission from the concerned authority of ethical committee of Bangladesh Health Professions Institute (BHPI).
- Before data collection, researcher has taken necessary permission from the concerned authorities and head of physiotherapy department for ensuring the safety of the participants.
- This study was an experimental study, so that involvement of clients, physiotherapist, equipments and other facilities is needed have for complete the study. During treatment session, if patients experience any negative effects, treatment would be stopped and the patient would be referred to the physician.
- The researcher strictly maintained the confidentiality regarding participant's condition and treatments.

3.17 Informed Consent

The researcher obtained consent to participate from every participant. A single informed consent form received from each participant. The participants informed that they have the right to meet with outdoor doctor if they think that the treatment is not enough to control the condition or if the condition become worsens. The participants are also informed that they were completely free to decline answering any question during the study and were free to withdraw their consent and terminate participation at any time. Withdrawal of participation from the study would not affect their treatment in the physiotherapy department and they would still get the same facilities.

Table 4.1: Base line characteristics:

Variables	Experimental group	Control group
	Mean with SD	Mean with SD
Age	54.64 (10.19)	56.33 (6.86)
Sex	Male 33.3% (n=5) Female 66.7% (n=10)	Male 53.3% (n=8) Female 46.7% (n=7)
Height (m)	1.56 (.08)	1.75 (.08)
Wight (kg)	62.27 (7.22)	64.73 (7.30)
BMI	26.09 (3.08)	26.02 (2.26)
Major working Position	Sitting 73.3% (n=11) Standing 20% (n=3) Traveling 6.7% (n=1)	Sitting 86.7% (n=13) Standing 13.3% (n=2)
Diabetics	Yes 26.7 % (n=4) No 73.3% (n=11)	Yes 33.3% (n=5) No 67.7% (n=10)
Pain intensity (pre test)	6.47 (1.50)	6.47 (1.72)
Disability on SPADI (pre test)	82.33 (23.5)	83.20 (36.07)
Tried treatment	Medical treatment 6.7% (n=1) Pain killer 33.3% (n=8) Traditional medicine 60% (n=9)	Medical treatment 6.7% (n=1) Pain killer 53.3% (n=8) Traditional medicine 40% (n=6)

Table 4.1 compare the baseline characteristics of participants between experimental and control group. In addition, two groups did not show significant difference at baseline regarding demographic characteristics and disease related parameters. In experimental group, the mean age (SD) of the participants was 54.64(10.19) years and in control group 56.33 (6.86) years. Male and female ratio in experimental was 1:1.97 while control group was 1:0.88. Initial mean (SD) pain intensity in experimental group was 6.47 (1.50) and control group was 6.47 (1.72). In addition mean (SD) weight in experimental group was 62.27(7.22) kg and control group was 64.73 (7.30) kg. Similarly mean (SD) height was 4.90 (.33) meter in experimental group and 64.73 (7.30) meter in control group participants. Major working position of the participant specially sitting 73.3% (n=11) in experimental group and 86.7% (n=13) was in control group. Chronic illness diabetic mellitus (DM) had in experimental group 26.7 % (n=4) and in control group 33.3% (n=5). Mean (SD) functional disability on SPADI in experimental group was 82.33 (23.5) and in contrast mean (SD) in control group was 83.20 (36.07). Major working position (sitting position) in experimental group was 73.3% (n=11) and in control group was 86.7% (n=13).

Quantitative data table:

Age group of the participants:

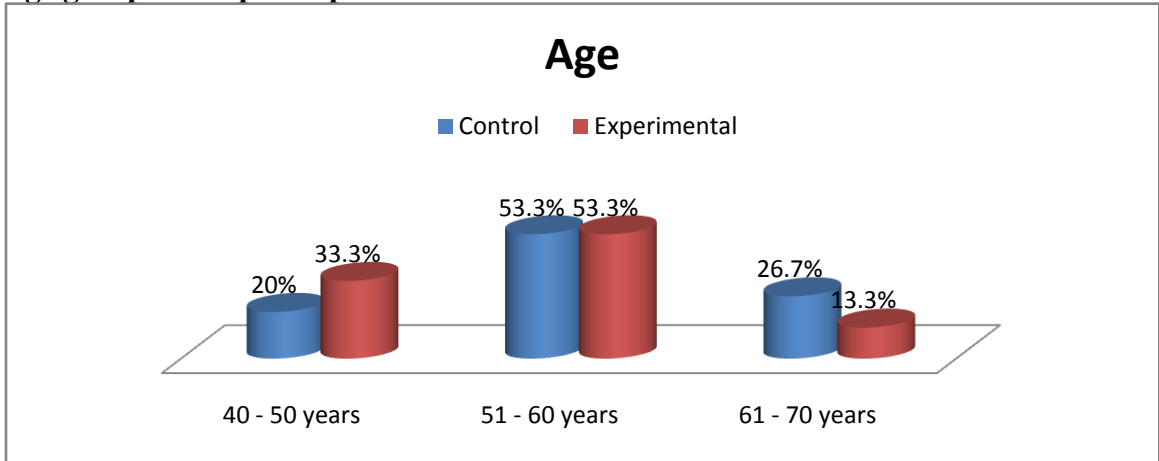


Figure 4.1: Age of the participants

Above the table 4.1 shows that majority of the participant within the 51-60 years age group and their percentage is 53.3% in both control and experimental groups.

Gender of the participants:

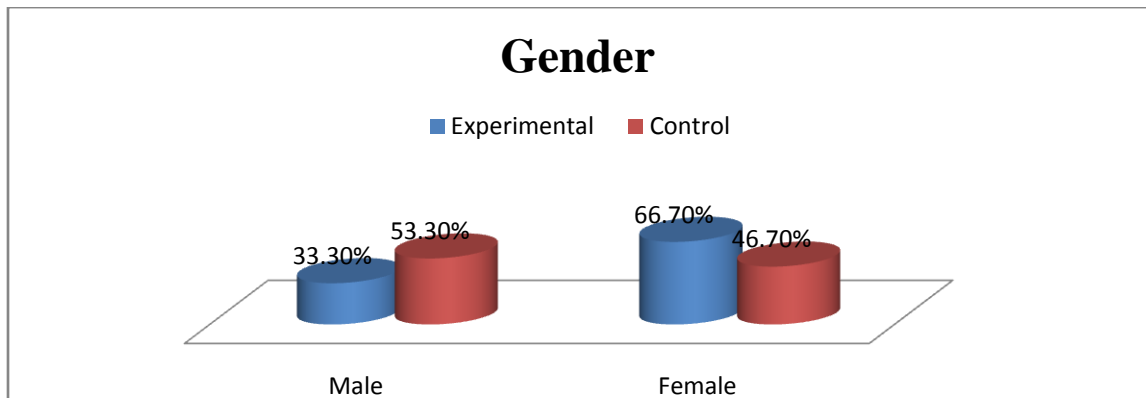


Figure 4.2: Gender of the participants

Above the figures 4.2 shows that in experimental group male 53.30% and female 46.70% where are in control group male 33.30% and female 66.70%.

Nutritional status:

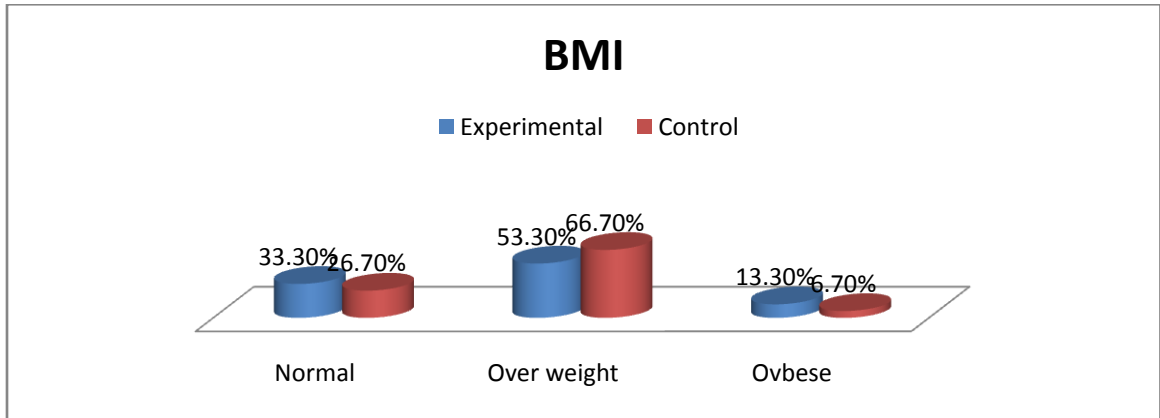


Figure 4.3: BMI of the participants

Above this figure 4.3 focus that majority responded in over weight group where are in experimental group in 53.3% and in control group 66.7%. In addition the mean BMI in experimental group is 26.02 and in control group is 26.09.

Living area:

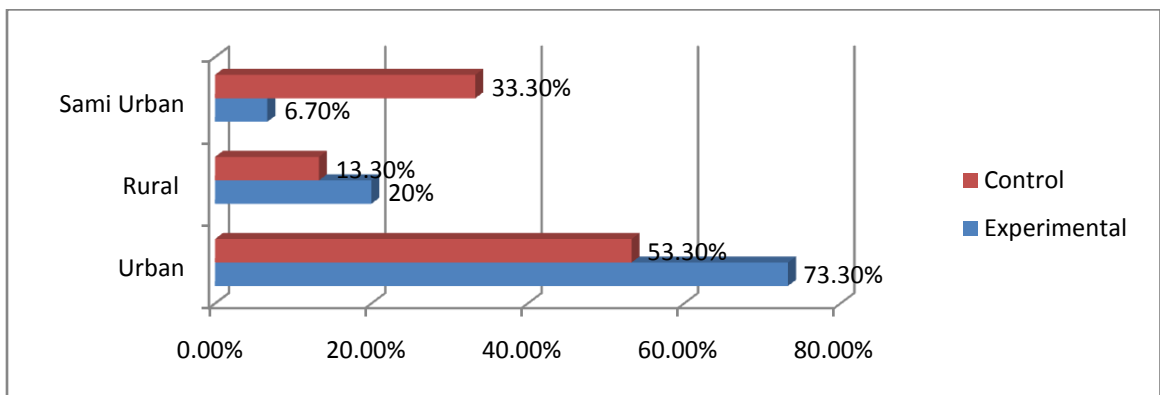


Figure 4.4: Living area of the participants

Majority of the participants are live in urban area among them in experimental group is 73.3% and in control group is 53.3%.

Educational status:

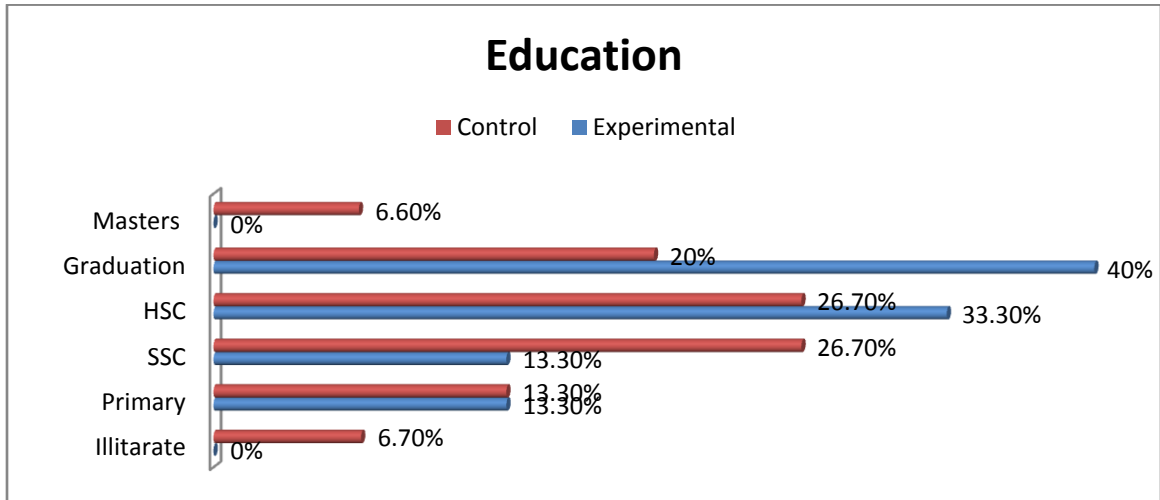


Figure 4.5: Education of the participants

Above figure 4.5 shows that only 40% graduate in experimental group and in the counter part i. e. control group is 20%.

Occupation:

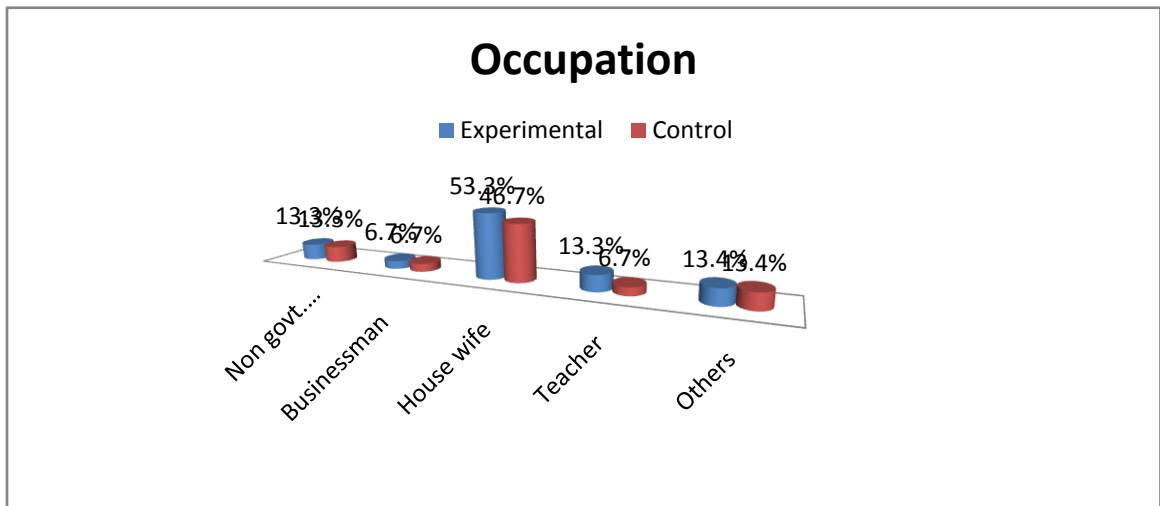


Figure 4.6: Occupation of the participants

Majority respondent are house wife among them in experimental group is 53.3% and in 46.7% in control group.

Working style:

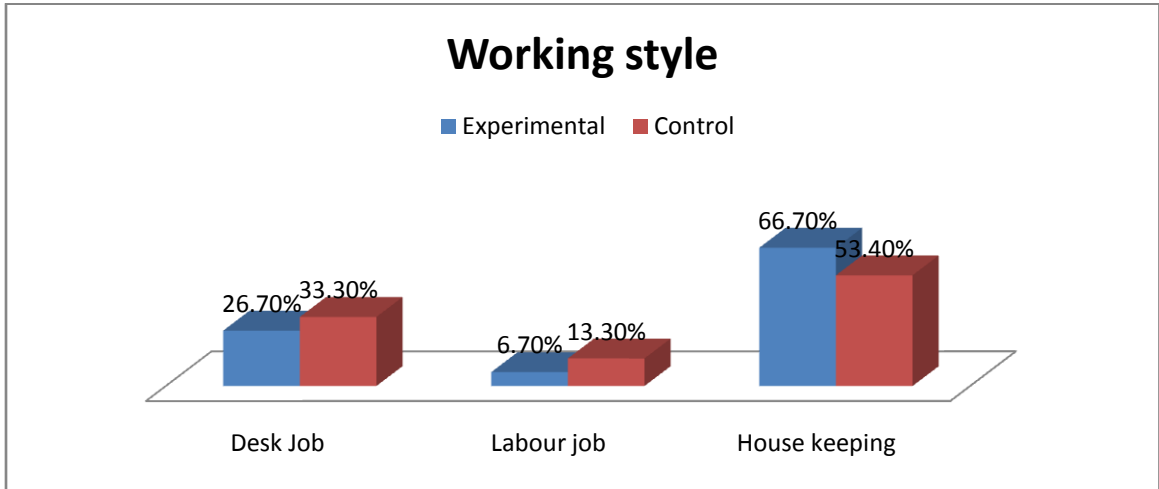


Figure 4.7: Working style of the participants

Above figure 4.7 focus that majority are doing housekeeping among them 66.7% in experimental group and only 40% in control group.

Major working position:

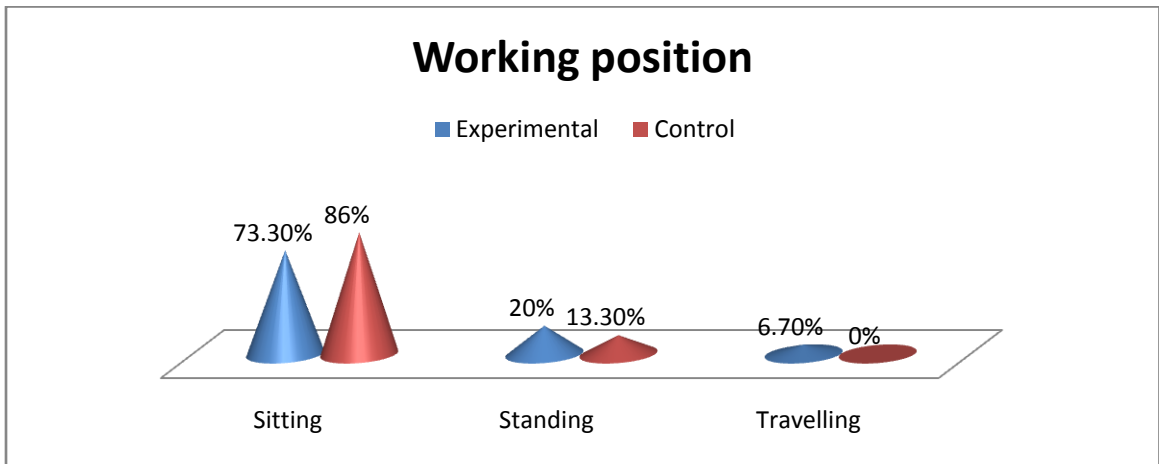


Figure 4.8: Major working position of the participants

Above figure 4.8 shows that major working positions is sitting and among them in experimental is 73% and in control group is 86%.

History of trauma:

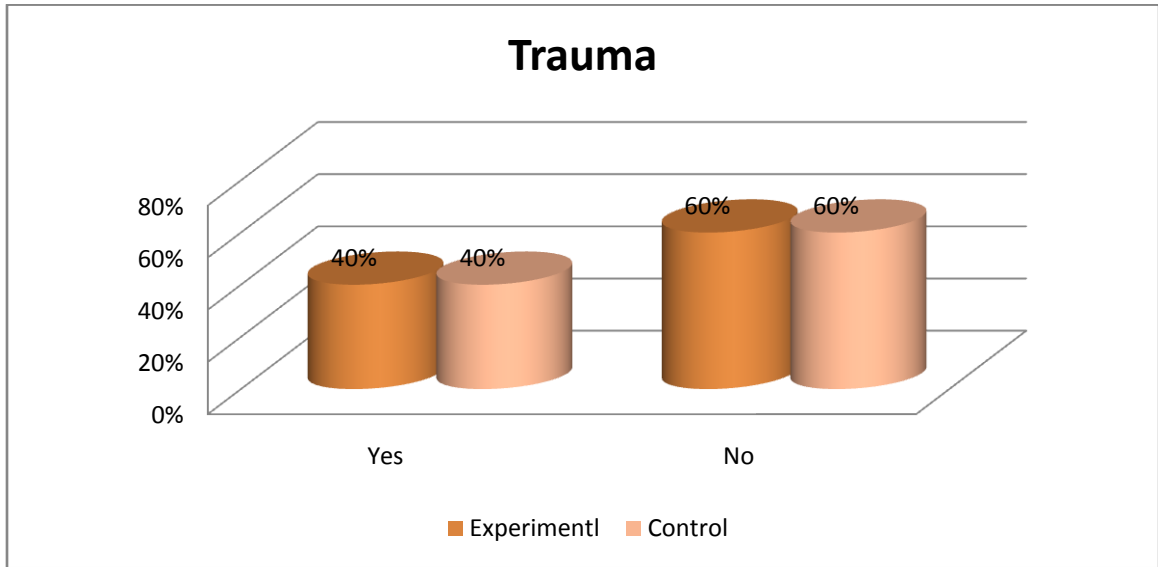


Figure 4.9: Traumatic history of the participants

Similar traumatic history in both groups where 40% and no 60% are in both group yes

Chronic illness Diabetic Mellitus(DM):

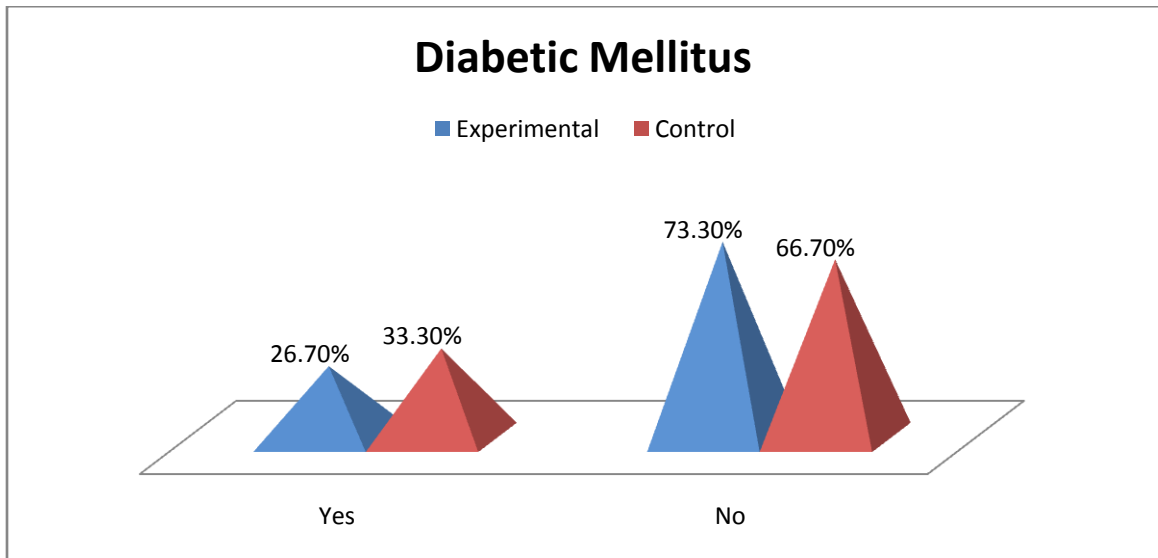


Figure 4.10: Diabetic Mellitus of the participants

In both group majority have no history of diabetic mellitus where are 26.7% positive history in experimental and 33.3% in control group.

Chronic illness Hypertension (HTN):

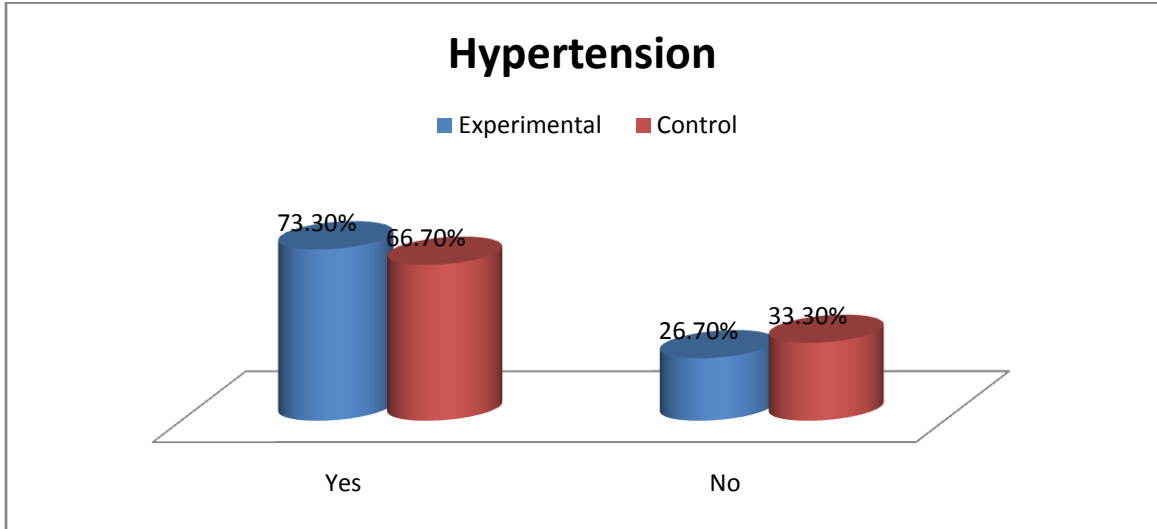


Figure 4.11: Hypertension Age of the participants

Above figure 4.11 shows that history of hypertension in experimental group is 73.3% and in control group is 66.7%.

Follow up performance:

Regular performing exercise:

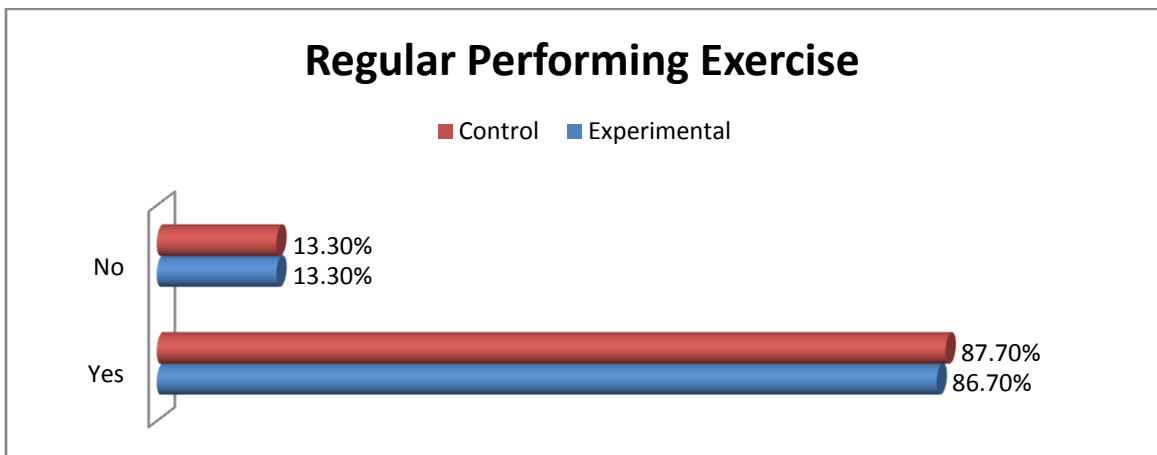


Figure 4.12: Follow up performance of the participants

In experimental group, 86.7% perform advice exercise regularly and in control group 87.7% perform regularly.

Mostly perform exercise in a day:

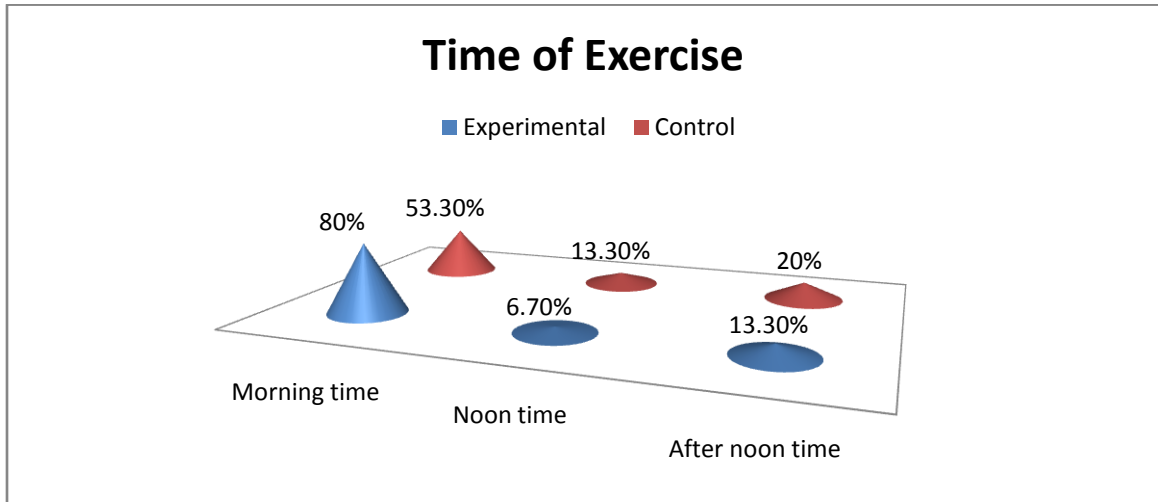


Figure 4.13: Mostly perform exercise in a day of the participants

From this figure 4.13 shows that mostly performing the given exercise in the morning time where are in experimental group 80% and in control group is 53.3%

Times in a day perform exercise:

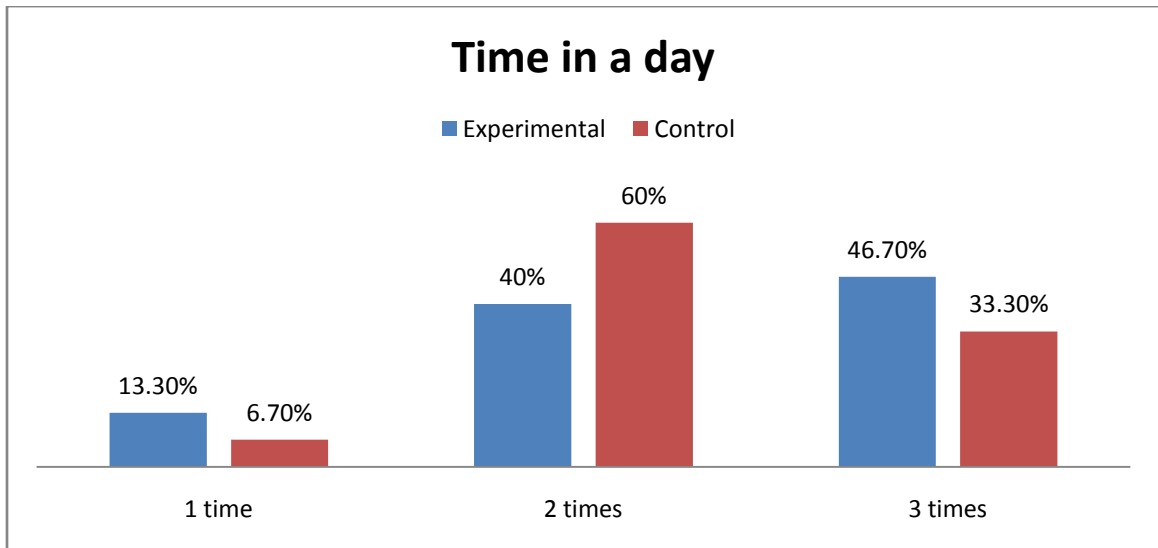


Figure 4.14: Times in a day perform exercise of the participants

Majority respondent perfume two time daily, where are experimental is 40% and in control group is 60%.

Comparative evaluation within the groups (pre and post treatment):

Table 4.2: Comparative pain intensity and disability of both groups

variable	Experimental group Mean with sd		p- value	Control group Mean with sd		p - value
	Pre	Post		Pre	Post	
NPRS	6.47 (1.50)	4.07 (1.62)	.000	6.47 (1.72)	4.20 (1.78)	.000
SPADI	82.33 (23.54)	52.67 (20.68)	.000	83.20 (36.07)	55.33 (32.21)	.000

Comparative pain intensity within group analysis found significant improvement in both experimental group and control groups ($p < 0.01$) and in case of functional disability also found significant in both groups.

Table 4.3: Mean of the differences of pain intensity and disability

Variable	Experimental group Mean of the differences with sd		p- value	Control group Mean of the differences with sd		p - value
	NPRS	2.40 (1.29)		.00	2.26 (.79)	
SPADI	29.66 (20.04)	.000	27.86 (20.02)	.000		

Mean of the difference of pain intensity and functional disability are greater in experimental group. That means of the difference of myofascial release technique (MFR) with conventional therapy is more effective for pain reduction and improves functional abilities of adhesive capsulitis patients than only the conventional therapy.

Table 4.4: Compare active range of motion (AROM) of shoulder joints (glenohumeral joints) of both groups.

Variable	Experimental group		p- value	Control group		p - value
	Pre	Post		Pre	Post	
AROM in flexion	117.67 (28.33)	145.33 (15.52)	.000	130.00 (18.17)	148 (14.73)	.000
AROM in extension	42.33 (10.32)	48.00 (5.60)	.005	43.33 (5.56)	50.33 (5.81)	.001
AROM in abduction	105.33 (35.88)	144.00 (25.29)	.001	124.67 (32.75)	147.33 (2.16)	.000
AROM in medial rotation	37.33 (21.20)	59.00 (11.98)	.000	40.33 (27.28)	59.33 (21.11)	.000
AROM in lateral rotation	32.00 (22.66)	57.67 (16.99)	.000	35.67 (26.91)	54.00 (22.29)	.000

Comparative active range of motion (AROM) of shoulder joints found significant ($p < 0.01$) improvement in active flexion, abduction, medial rotation and lateral rotation in both experimental and control groups that mean myofascial release technique (MFR) and conventional physiotherapy is effective for increase range of motion (ROM) of adhesive capsulitis patients.

Table 4.5: Mean of the difference of AROM of shoulder joints (glenohumeral joint) in both groups.

Variable	Experimental group	p- value	Control group	p - value
	Mean of the difference with sd		Mean of the difference with sd	
AROM in flexion	27.66 (19.35)	.000	18.00 (11.46)	.000
AROM in extension	5.66 (6.51)	.005	7.00 (6.76)	.001
AROM in abduction	38.66 (33.61)	.000	22.66 (16.56)	.000
AROM in medial rotation	21.66 (17.28)	.000	19.00 (13.25)	.000
AROM in lateral rotation	25.66 (18.11)	.000	18.33 (12.91)	.000

This table 4.5 showed that obviously increase range of motion in experimental group (MFR group) in terms of active shoulder flexion, abduction, medial rotation and lateral rotation compare with control group that mean myofascial release technique is more effective for adhesive capsulitis patients.

Table 4.6: Compare of passive range of motion (PROM) of glenohumeral joints of both groups:

Variable	Experimental group Mean with sd		p- value	Control group Mean with sd		p - value
	Pre	Post		Pre	Post	
PROM in flexion	120.67 (26.38)	146.00 (14.16)	.000	136.67 (18.19)	150.67 (13.99)	.000
PROM in extension	45.33 (8.55)	49.33 (2.58)	.034	47.33 (4.16)	51.33 (6.67)	.017
PROM in abduction	116.00 (35.46)	145.00 (23.06)	.001	130.00 (32.51)	150.67 (17.81)	.001
PROM in medial rotation	38.33 (20.23)	62.00 (12.07)	.000	40.33 (27.28)	59.33 (21.11)	.000
PROM in lateral rotation	40.33 (25.52)	58.00 (22.74)	.000	35.67 (26.91)	54.00 (22.29)	.000

Comparative of passive range of motion (PROM) showed that significant ($p < 0.05$) improvement of passive flexion, abduction, medial rotation and lateral rotation in both experimental and control groups.

Table 4.7: Mean of the differences of PROM of both groups

Variable	Experimental group Mean of the difference with sd		p- value	Control group Mean of the difference with sd		p - value
PROM in flexion	25.33 (17.97)		.000	14.00 (9.29)		.000
PROM in extension	4.00 (6.69)		.034	4.00 (7.73)		.017
PROM in abduction	29.00 (26.06)		.001	20.66 (17.91)		.001
PROM in medial rotation	23.66 (17.67)		.000	14.00 (12.70)		.000
PROM in lateral rotation	25.66 (18.50)		.000	17.66 (11.62)		.000

Mean of the difference of PROM of flexion, abduction, medial rotation and lateral rotation in experimental group was higher than mean myofascial release therapy is effective for adhesive capsulitis for increase range of motion of gleno-humeral joints.

Table 4.8: Compare AROM of shoulder girdle in both groups:

Variables	Experimental group Mean with sd		P - value	Control group Mean with sd		p - value
	pre	post		pre	post	
	Active forward elevation	40.00 (2.67)		43.33 (2.44)	.01	
Active external rotation	62.33 (7.76)	68.67 (5.49)	.001	60.67 (7.98)	70.67 (3.71)	.000
Active external rotation (arm 90° abduction)	60.67 (16.13)	69.67 (10.25)	.000	64.67 (8.12)	72.33 (4.95)	.000
Active internal rotation	52.33 (17.91)	65.00 (8.81)	.006	56.00 (11.21)	68.00 (6.49)	.000
Active cross body adduction function	62.00 (9.78)	68.33 (5.56)	.002	62.67 (7.28)	70.67 (3.71)	.000

Above table 4.8 shows that comparison between before and after treatment, outcome of active range of movement shoulder girdle in both groups found significant improvement in control group as well as experimental group.

Table 4.9: Mean of the differences of AROM of Shoulder girdle

Variables	Experimental group Mean of the differences with sd	P - value	Control group Mean of the differences with sd	p - value
Active forward elevation	3.33 (3.08)	.01	4.33 (3.20)	.000
Active external rotation	6.33 (6.11)	.001	10.00 (5.97)	.000
Active external rotation (arm 90° abduction)	9.00 (7.36)	.000	7.66 (6.23)	.000
Active internal rotation	12.66 (14.98)	.006	12.00 (6.21)	.000
Active cross body adduction	6.33 (6.39)	.002	8.00 (5.91)	.000

From the table 4.9 we see that the greater mean of the difference is in the control group that is mean conventional physiotherapy was effective in increasing in the active range of motion of shoulder girdle of patient with adhesive capsulities of shoulder joints.

Table 4.10: Compare PROM shoulder girdle of both groups

Variables	Experimental group Mean with sd		P - value	Control group Mean with sd		p - value
	pre	post		pre	post	
Passive forward elevation	41.33 (2.28)	44.33 (1.75)	.000	41.33 (4.80)	44.67 (1.29)	.007
Passive external rotation	66.33 (8.95)	72.33 (6.77)	.002	64.67 (7.66)	75.00 (3.78)	.000
Passive external rotation (arm 90° abduction)	65.00 (17.00)	71.33 (12.31)	.052	68.33 (7.23)	76.00 (5.07)	.000
Passive internal rotation	55.67 (18.60)	68.33 (10.08)	.006	61.20 (10.99)	72.67 (6.51)	.000
Passive cross body adduction function	65.33 (10.08)	71.67 (4.88)	.005	67.27 (6.51)	75.00 (4.62)	.000

From the above table 4.10 it is evident that the passive forward elevation had significant outcome in experimental group while passive external rotation, internal rotation and cross body adduction were good result in control group.

Table 4.11: Mean of the of the differences of PROM of Shoulder girdle

Variables	Experimental group	P - value	Control group	p - value
	Mean of the differences with sd		Mean of the differences with sd	
Passive forward elevation	3.00 (2.53)	.001	3.33 (4.08)	.007
Passive external rotation	6.00 (6.03)	.002	10.33 (6.11)	.000
Passive external rotation (arm 90° abduction)	6.33 (11.56)	.052	7.66 (6.51)	.000
Passive internal rotation	12.66 (15.10)	.006	11.46 (6.39)	.000
Passive cross body adduction function	6.33 (7.43)	.005	7.77 (6.02)	.000

This table 4.11 found that mean of the differences of PROM of shoulder girdle is better in the control group.

Table 4.12: Compare the pain and functional disability on Shoulder Pain and Disability Index (SPADI) scale in both groups:

Variables	Experimental group Mean with sd		P - value	Control group Mean with sd		p - value
	pre	post		pre	post	
Pain on SPADI %	64.53 (22.46)	43.20 (19.94)	.000	70.80 (27.66)	48.33 (25.01)	.000
Functional disability%	54.07 (18.95)	35.87 (17.02)	.000	59.87 (22.26)	40.87 (20.63)	.000
Total SPADI %	82.33 (23.54)	52.67 (20.68)	.000	83.20 (36.07)	55.33 (32.21)	.000
Sum of pain	32.13 (11.31)	21.47 (9.59)	.000	83.20 (36.07)	24.00 (12.51)	.000
Sum of function	43.53 (15.82)	28.73 (13.65)	.000	49.80 (17.59)	34.33 (13.11)	.00

This table 4.12 showed that general pain intensity was (significant $p < 0.05$) improvement in both experimental and control group, improvement of functional disability in both groups, improvement of total disability score was also good in both groups. Differently found total pain and functional score on SPADI scale was also significant ($p < 0.05$) in both groups.

Table 4.13: Mean of the differences of pain and functional disability on SPADI scale in both groups

Variables	Experimental group	P - value	Control group	p - value
	Mean of the differences with sd		Mean of the differences with sd	
Pain on SPADI %	21.33 (14.19)	.000	22.46 (14.76)	.000
Functional disability%	18.20 (10.91)	.000	19.00 (13.78)	.000
Total SPADI %	29.66 (20.04)	.000	27.86 (20.02)	.000
Sum of pain	10.66 (7.15)	.000	12.26 (7.44)	.000
Sum of function	14.80 (9.22)	.000	15.46 (9.70)	.000

Obviously mean of the differences were higher within the experimental group than control group on pain and functional disability of adhesive capsulitis. That meant myofascial release technique (MFR) with conventional therapy had very good result in term of pain reduction and increase functional abilities of patient with adhesive capsulitis.

Pain status:

General pain intensity:

In this study it is found that general pain intensity in the experimental group observed t value is 7.159 at two tailed paired t test while this same variable for control group the observed value is 10.99 within group. At 5% level of significant with 14 degree of freedom standard t value is 2.145 and observed t value in general pain intensity in both group are greater than standard t value that mean null hypothesis may be rejected and alternative hypothesis may be accepted for within group. In both groups in aspect of general pain intensity it is significant at 0.1% level of significant.

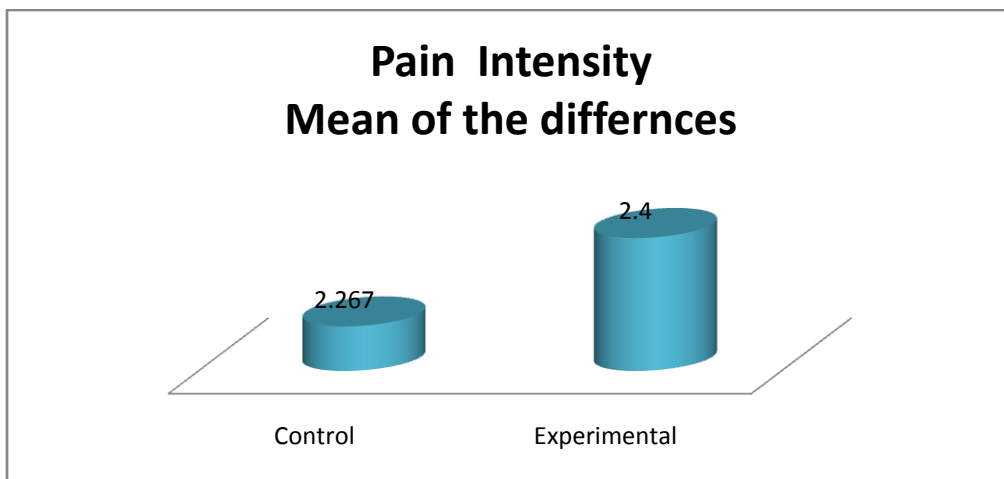


Fig: 4.15 Numeric pain rating scale

From the above figure 4.15, it has been shown that the mean of the difference is obviously greater within experimental group.

The unrelated/ unpaired t test in between group at 5 % level of significant with 28 degrees of freedom standard tabulated value is 2.048 and the same significant level for the same degrees of freedom observed t value is .214. So, the observed t value is smaller than the tabulated value that means null hypothesis may be accepted and alternative hypothesis may be rejected which means the progression are same in both groups. There is no difference myofascial release technique with conventional physiotherapy and only conventional physiotherapy treatment for adhesive capsulitis in between group.

Range of motion of shoulder girdle:

Active forward elevation (maximum arm trunk angle):

In this study it is found that active forward elevation of shoulder girdle (maximum arm trunk angle) in the experimental group observed t value is 4.18 at two tailed paired t test while this same variable for control group the observed value is 5.245 within group. At 5% level of significant with 14 degree of freedom standard t value is 2.145 and observed t value in active forward elevation in both groups are greater than standard t value that means the null hypothesis may be rejected and alternative hypothesis may be accepted for within group. For both groups in aspect range of motion of shoulder girdle in active forward elevation are significant at 0.01% level of significant.

The unpaired t test in between group at 5 % level of significant with 28 degrees of freedom standard table value is 2.048 and for calculated value of t is .642. So, the observed t value is smaller than the tabulated value that means null hypothesis may be accepted and alternative hypothesis may be rejected which means the progression are same in both groups. There is no difference myofascial release technique with conventional physiotherapy and only conventional physiotherapy treatment for adhesive capsulitis in between groups.

Passive forward elevation (maximum arm trunk angle):

This study found that passive forward elevation of shoulder girdle (maximum arm trunk angle) in the experimental group observed t value is 4.583 at two tailed paired t test while this same variable for control group the observed value is 3.162 within group. At 5% level of significant at 14 degree of freedom standard t value is 2.145 and observed t value in passive forward elevation in both group are greater than standard t value that mean null hypothesis may be rejected and alternative hypothesis may be accepted for within group. In both groups in aspect range of motion of shoulder girdle in passive forward elevation it is significant at 0.01% level of significant.

The unpaired t test in between group at 5 % level of significant with 28 degrees of freedom standard table value is 2.048 and for the calculated value of t is .592. So, the observed t value is smaller than the tabulated value that means null hypothesis may be accepted and alternative hypothesis may be rejected which means the progression are same in both groups. There is no difference myofascial release technique (MFR) with

conventional physiotherapy and only conventional physiotherapy treatment for adhesive capsulitis in between groups.

Active external rotation (arm comfortable site):

Study result shows that active external rotation (arm comfortable site) of shoulder girdle in the experimental group observed t value is 4.012 at two tailed paired t test while this same variable for control group the observed value is 6.481 within group. At 5% level of significant with 14 degree of freedom standard t value is 2.145 and observed t value in general pain intensity in both group are greater than standard t value. So we may be reject the null hypothesis and alternative hypothesis may be accepted for within group. In both groups in aspect range of motion of shoulder girdle in active external rotation it is significant at 0.01% level of significant.

The unpaired t test in between group at 5 % level of significant with 28 degrees of freedom standard table value is 2.048 and for the calculated value of t is 1.167. So, the observed t value is smaller than the slandered tabulated value that mean null hypothesis may be accepted and alternative hypothesis may be rejected which means the progression are same in both groups. There is no difference myofascial release technique with conventional physiotherapy and only conventional physiotherapy treatment for adhesive capsulitis in between groups.

Passive external rotation (arm comfortable site):

In this study it is found that passive external rotation (arm comfortable site) of shoulder girdle in the experimental group observed t value is 3.850 at two tailed paired t test while this same variable for control group the observed value is 6.546 within group. At 5%

level of significant at 14 degree of freedom standard t value is 2.145 and observed t value in passive external rotation of shoulder girdle in both group are greater than standard t value, so we may reject null hypothesis and alternative hypothesis may be accepted for within group. In both groups in aspect range of motion of shoulder girdle in passive external rotation it is significant at 0.01% level of significant.

The unpaired t test in between group at 5 % level of significant with 28 degrees of freedom standard table value is 2.048 and for the calculated value of t is 1.331. So, the observed t value is smaller than the tabulated value that means null hypothesis may be accepted and alternative hypothesis may be rejected which means the progression are same in both groups. There is no difference myofascial release technique with conventional physiotherapy and only conventional physiotherapy treatment for adhesive capsulitis in between group.

Active external rotation (arm at 90° abduction):

In this study it is found that active external rotation (arm at 90° abduction) of shoulder girdle in the experimental group observed t value is 4.731 at two tailed paired t test while this same variable for control group the observed value is 7.483 within group. At 5% level of significant with 14 degree of freedom standard t value is 2.145 and observed t value in active external rotation (arm at 90° abduction) of shoulder girdle in both groups are greater than standard t value that mean null hypothesis may rejected and alternative hypothesis may be accepted for within group. In both groups, in aspect range of motion of shoulder girdle in active external rotation it is significant at 0.01% level of significant.

The unpaired t test in between group at 5 % level of significant with 28 degrees of freedom standard tabulated value is 2.048 and the same significant level for the same degree of freedom observed t value is .907. So, the observed t value is smaller than the tabulated value that means null hypothesis may be accepted and alternative hypothesis may be rejected which means the progression were same in both groups. There is no difference myofascial release technique (MFR) with conventional physiotherapy and only conventional physiotherapy treatment for adhesive capsulitis in between group.

Range of motion of glanu-humeral joint:

Active shoulder flexion:

In this study it is found that active shoulder flexion in the experimental group observed t value is 5.537 at two tailed paired t test while this same variable for control group the observed value is 6.081 within group. At 5% level of significant with 14 degree of freedom standard t value is 2.145 and observed t value in active shoulder flexion in both groups are greater than standard t value that means null hypothesis may be rejected and alternative hypothesis may be accepted for within group. In both groups in aspect range of motion of shoulder flexion it is significant at 0.01% level of significant.

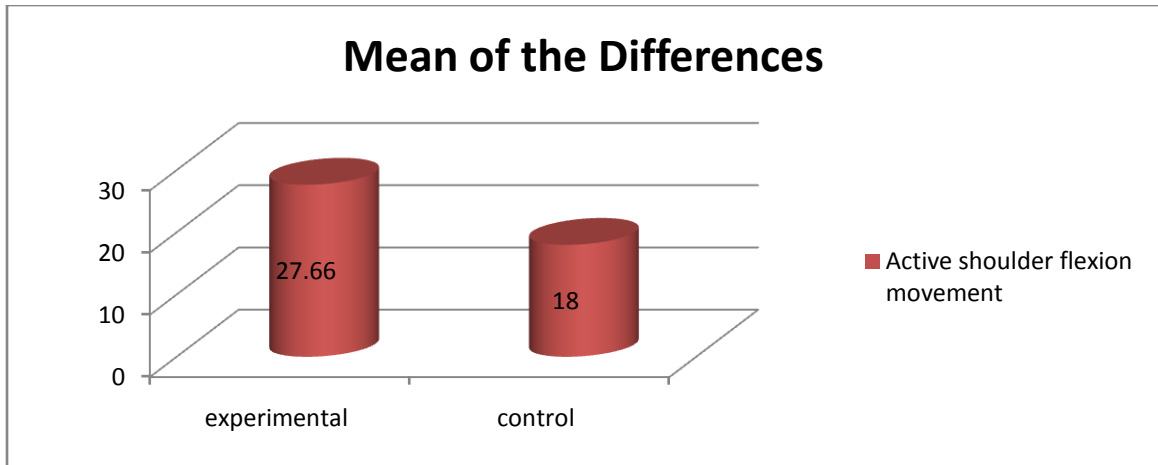


Fig 4.16: Active shoulder flexion movement

From the above figure 4.16, it has been shown that the mean of the differences is obviously greater within experimental group.

The unpaired t test in between group at 5 % level of significant with 28 degrees of freedom standard tabulated value is 2.048 and the same significant level for same degree of freedom observed t value is .483. So, the observed t value is smaller than the tabulated value that means null hypothesis may be accepted and alternative hypothesis may be rejected which means the progression were same in both groups. There is no difference myofascial release technique (MFR) with conventional physiotherapy and only conventional physiotherapy treatment for adhesive capsulitis in between groups.

Active shoulder extension:

In this study it is found that active shoulder extension in the experimental group observed t value is 3.371 at two tailed paired t test while this same variable for control group the observed value is 4.010 within group. At 5% level of significant with 14 degree of freedom standard t value is 2.145 and observed t value in active shoulder flexion in both

groups which are greater than standard t value that means null hypothesis may be rejected and alternative hypothesis may be accepted for within group. In both groups in aspect range of motion of shoulder extension is significant at 0.01% level of significant.

The unpaired t test in between group at 5 % level of significant with 28 degrees of freedom standard tabulated value is 2.048 and the same significant level for same degree of freedom observed t value is 1.119. So, the observed t value is smaller than the tabulated value that means null hypothesis may be accepted and alternative hypothesis may be rejected which means the progression were same in both groups. There was no difference myofascial release technique (MFR) with conventional physiotherapy and only conventional physiotherapy treatment for adhesive capsulitis in between groups.

Active abduction of shoulder joint:

In this study it is found that active shoulder abduction in the experimental group observed t value is 4.45 at two tailed paired t test while this same variable for control group the observed value is 5.298 within group. At 5% level of significant with 14 degree of freedom standard t value is 2.145 and observed t value in active shoulder abduction in both groups are greater than standard t value that means null hypothesis may be rejected and alternative hypothesis may be accepted in within group. Both groups in aspect range of motion of shoulder abduction it is significant at 0.01% level of significant.

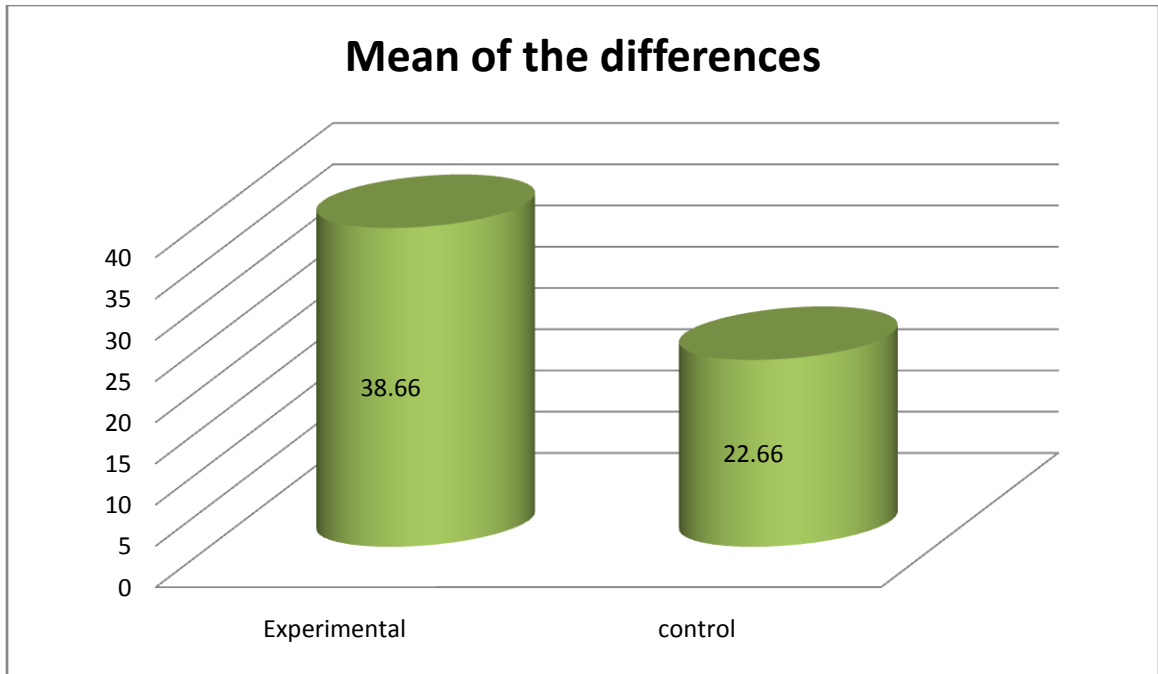


Figure 4.17: Active shoulder abduction movement

From the above figure 4.17, it has been shown that mean of the difference is obviously greater within experimental group.

The unpaired t test in between group at 5 % level of significant with 28 degrees of freedom standard tabulated value is 2.048 and the same significant level for same degree of freedom observed t value is .399. So, the observed t value is smaller than the table value that means null hypothesis may be accepted and alternative hypothesis may be rejected which means the progression were same in both groups. There was no difference myofascial release technique (MFR) with conventional physiotherapy and only conventional physiotherapy treatment for adhesive capsulitis in between groups.

Active lateral rotation of shoulder joint:

In this study it is found that active shoulder lateral rotation in the experimental group observed t value is 5.488 at two tailed paired t test while this same variable for control group the observed value is 5.500 within group. At 5% level of significant with 14 degree of freedom standard t value is 2.145 and observed t value in active shoulder lateral rotation in both groups are greater than standard t value that means null hypothesis may be rejected and alternative hypothesis may be accepted for within group. In both groups in aspect range of motion of shoulder lateral rotation it is significant at 0.01% level of significant.

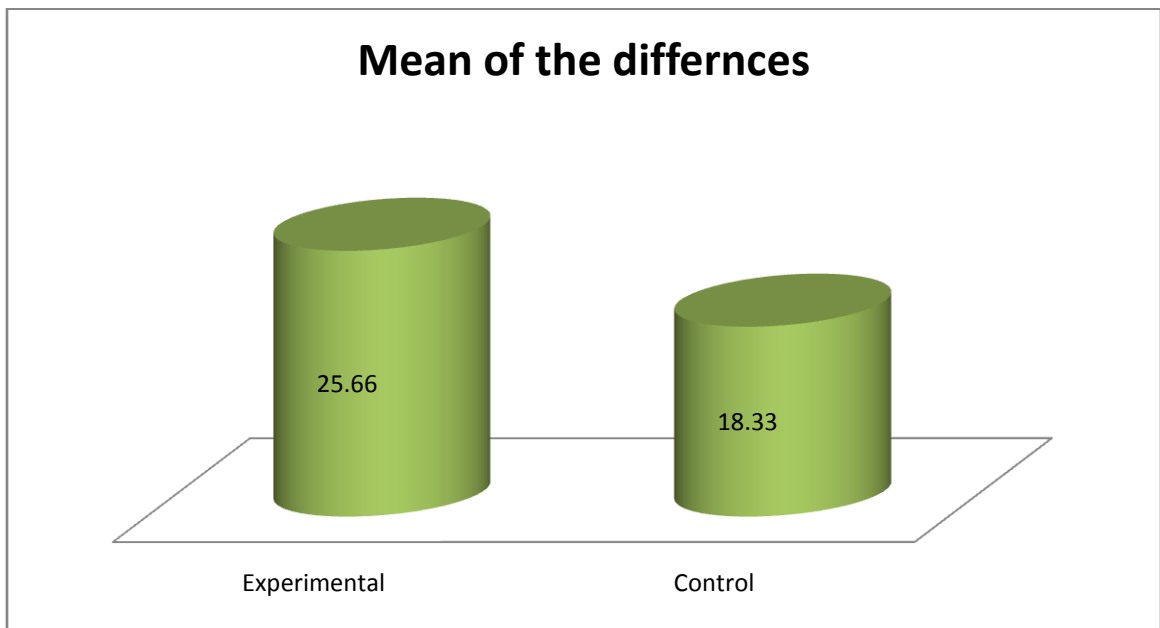


Figure 4.18: Active lateral rotation of shoulder joint

From the above figure 4.18, it has been shown that mean of the differences is obviously greater within experimental group.

The unpaired t test in between group at 5 % level of significant with 28 degrees of freedom standard table value is 2.048 and the same significant level for same degree of freedom observed t value is .507. So, the observed t value is smaller than the tabulated value that means null hypothesis may be accepted and alternative hypothesis may be rejected which means the progression are same in both groups. There was no difference myofascial release technique (MFR) with conventional physiotherapy and only conventional physiotherapy treatment for adhesive capsulitis in between group.

Active medial rotation of shoulder joint:

In this study it is found that active shoulder medial rotation in the experimental group observed t value is 4.854 at two tailed paired t test while this same variable for control group the observed value is 5.551 within group. At 5% level of significant with 14 degree of freedom standard t value is 2.145 and observed t value in active shoulder medial rotation in both groups are greater than standard t value that means null hypothesis may be rejected and alternative hypothesis may be accepted for within group. In both groups in aspect range of motion of shoulder lateral rotation it is significant at 0.01% level of significant.

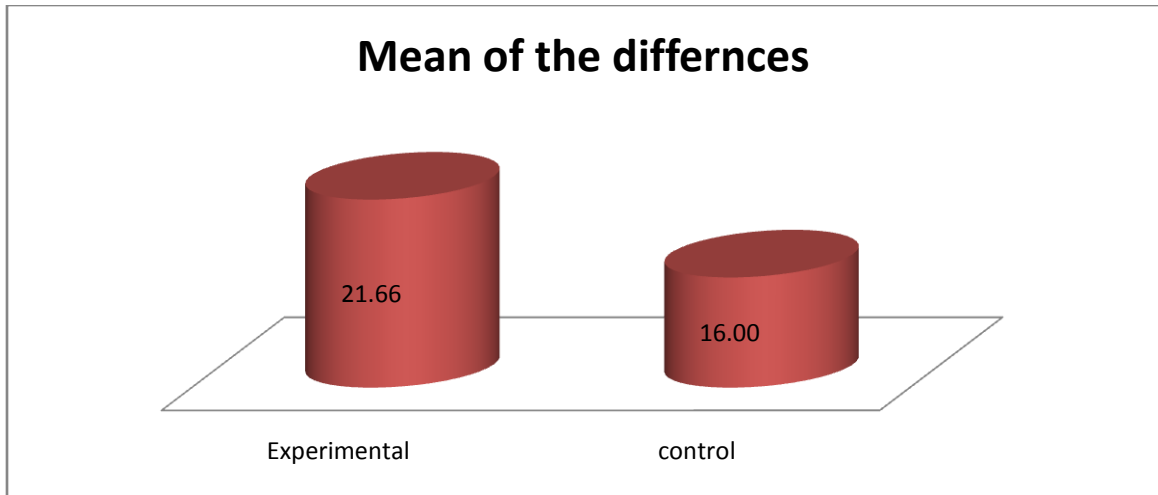


Figure 4.19: Active medial rotation of shoulder joint

From the above figure 4.19, it has been shown that mean of the differences is obviously greater within experimental group.

The unpaired / independent t test in between group at 5 % level of significant with 28 degrees of freedom standard tabulated value is 2.048 and the same significant level for same degree of freedom observed t value is .053. So, the observed t value is smaller than the tabulated value that means null hypothesis may be accepted and alternative hypothesis may be rejected which means the progression are same in both groups. There is no difference myofascial release technique (MFR) with conventional physiotherapy and only conventional physiotherapy treatment for adhesive capsulitis in between group.

Passive medial rotation of shoulder joint:

In this study it is found that passive shoulder medial rotation in the experimental group observed t value is 5.186 at two tailed paired t test while this same variable for control group the observed value is 4.711 within group. At 5% level of significant with 14 degree

of freedom standard t value is 2.145 and observed t value in passive shoulder medial rotation in both groups which are greater than standard t value that mean null hypothesis may be rejected and alternative hypothesis may be accepted for within group. In both groups in aspect range of motion of shoulder lateral rotation it is significant at 0.01% level of significant.

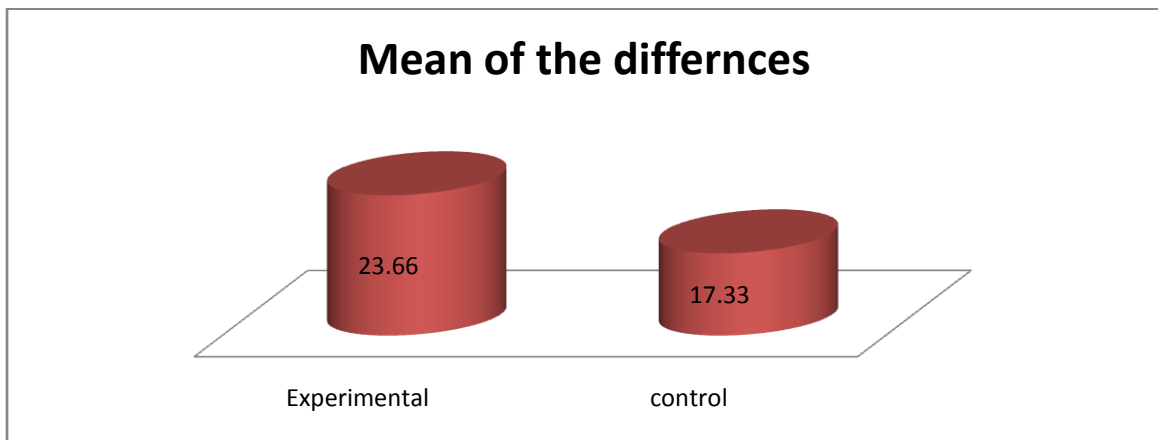


Figure 4.20: Passive medial rotation of shoulder joint

From the figure 4.20, it has been shown that mean of the difference is obviously greater within experimental group.

The unpaired t test in between group at 5 % level of significant with 28 degrees of freedom standard tabulated value is 2.048 and the same significant level for same degree of freedom observed t value is .107. So, the observed t value is smaller than the tabulated value that means null hypothesis may be accepted and alternative hypothesis may be rejected which means the progression are same in both groups. There is no difference myofascial release technique (MFR) with conventional physiotherapy and only conventional physiotherapy treatment for adhesive capsulitis in between groups.

Disability scale by Shoulder Pain and Disability Index (SPADI):

Total pain and functional disability score on SPADI scale:

In this study it is found that pain and functional disability score on SPADI scale in the experimental group observed t value is 5.73 at two tailed paired t test while this same variable for control group the observed value is 5.38 within group. At 5% level of significant with 14 degree of freedom standard t value is 2.145 and observed t value in pain score on SPADI scale in both groups are greater than standard t value that mean null hypothesis may be rejected and alternative hypothesis may be accepted for within group. In both groups in aspect range of motion of shoulder lateral rotation it is significant at 0.01% level of significant.

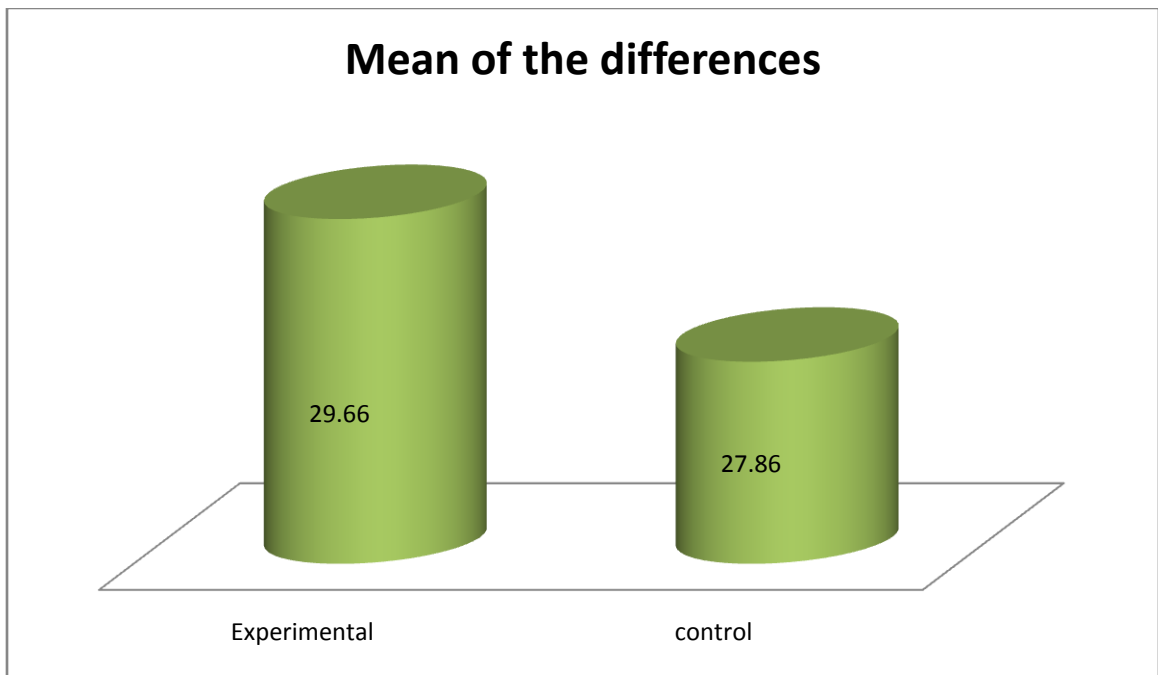


Figure 4.21: Total pain and functional disability score on SPADI scale

From the above figure 4.21, it has been shown that mean of the difference is obviously greater within experimental group that means the myofascial release technique (MFR) with conventional physiotherapy for adhesive capsulitis of shoulder joints reduce pain when lying on involved side, reaching on a high shelf, touching the back, pushing with the involved arm and placing an object on a high shelf.

The unpaired t test in between group at 5 % level of significant with 28 degrees of freedom standard tabulated value is 2.048 and the same significant level for same degree of freedom observed t value is .621. So, the observed t value is smaller than the tabulated value that mean null hypothesis may be accepted and alternative hypothesis may rejected which means the progression were same in both groups. There is no difference myofascial release technique (MFR) with conventional physiotherapy and only conventional physiotherapy treatment for adhesive capsulitis in between group.

Summation of pain score on SPADI scale:

In this study found that summation of pain score on SPADI scale in the experimental group observed t value is 5.771 at two tailed paired t test while this same variable for control group the observed value is 6.38 within group. At 5% level of significant at 14 degree of freedom standard t value is 2.145 and observed t value in pain score on SPADI scale in both groups which are greater than standard t value that mean null hypothesis may be rejected and alternative hypothesis may be accepted for within group. In both groups in aspect range of motion of shoulder lateral rotation it is significant at 0.01% level of significant. The mean difference of the control group was slightly better than the experimental group that means the conventional physiotherapy for adhesive capsulitis of

shoulder joints reduce pain when lying on involved side, reaching on a high shelf, touching the back, pushing with the involved arm and placing an object on a high shelf.

The unpaired t test in between group at 5 % level of significant with 28 degrees of freedom standard tabulated value is 2.048 and the same significant level for same degree of freedom observed t value is .622. So, the observed t value is smaller than the table value that mean null hypothesis may be accepted and alternative hypothesis may be rejected which means the progression were same in both groups. There is no difference myofascial release technique (MFR) with conventional physiotherapy and only conventional physiotherapy treatment for adhesive capsulitis in between group.

Summation of functional score on SPADI scale:

In this study it is found that summation of function score on SPADI scale in the experimental group observed t value is 6.211 at two tailed paired t test while this same variable for control group the observed value is 6.17 within group. At 5% level of significant with 14 degree of freedom standard tabulated t value is 2.145 and observed t value in pain score on SPADI scale in both groups are greater than standard tabulated t value that mean null hypothesis may be rejected and alternative hypothesis may be accepted for within group. In both groups in aspect functional outcome it is significant at 0.01% level of significant. That means the myofascial release technique (MFR) with conventional physiotherapy for adhesive capsulitis of shoulder joints have positive roll to improve function during washing hair, washing back, putting on an under shirt or jumper, putting on a shirt that buttons down the front, putting on pants, placing heavy object on a

high shelf, carrying heavy object of 4.5 kilograms and removing something from back pocket.

The unpaired t test in between group at 5 % level of significant with 28 degrees of freedom standard tabulated value is 2.048 and the same significant level for same degree of freedom observed t value is 1.002. So, the observed t value is smaller than the table value that means null hypothesis may be accepted and alternative hypothesis may be rejected which means the progression are same in both groups. There is no difference myofascial release technique (MFR) with conventional physiotherapy and only conventional physiotherapy treatment for adhesive capsulitis in between groups.

Adhesive capsulitis is a condition of uncertain etiology characterized by a progressive loss of both active and passive shoulder motion (Yang, J L et al. 2007). Shoulder girdle stiffness along with pain during shoulder joint movement is cardinal feature of adhesive capsulitis. In pathological consideration main pathology process going on glenohumeral joints but its impact goes to scapula-thoracic joints that mean it restricted the scapula-thoracic movements and produce tightness around the scapular border muscles.

When selecting a physical treatment method for adhesive capsulitis, it is extremely important to consider the patient's symptoms, stage of the condition, and recognition of different patterns of motion loss. Generally, the greatest change noted with manual movement techniques (MMT) for increase in range of motion (ROM) and functions rather than pain.

In Bangladesh many experts physiotherapist give their opinions that improve the scapula-thoracic movement reduce the pain and stiffness of shoulder girdle as well as shoulder joints and finally improve the functional activities. Similarly a RTC study found that myofascial trigger point release technique on three border of scapula reduces pain and increase range of motion as well as shoulder function (Bron, et al.,2011).

So the aim of this study is to compare the effectiveness of the myofascial release along with conventional physiotherapy and only conventional physiotherapy of the subjects

with adhesive capsulitis to reduce pain, to improve the mobility and to improve the functional abilities.

The present study found almost similar characteristics on baseline in age, gender, body mass index. Mean age of the experimental group was 54.64 years while control group was 56.33 years and majority (53.3%) of the participant were within the age group of 51-60 years. The mean BMI within the trail group was 26.09 while control group was 26.02, where 60% were overweight, 10% obese and 30% within normal limit. 63.30% live in urban area while 16.70% in rural area of the total participants. Educational status among the total participant, only 30% were completes their graduation degree while 3.30% were illiterate. 50% respondents were house wife and 10% were teacher among total participants. Majority (56.70%) participants were involved in housekeeping and 30% in desk job among all respondents. Major working positions were found in sitting (80%) and in standing (16.70%) of their daily task. In occupational category; 50% participants were house wife, 10% teacher, 6.70% businessman and 3.30% farmer. Only 40% respondent had history of trauma among the total study participants and 70% had diabetic's mellitus and hypertension.

Follow up performance; 86.7% participants did their exercise regularly, 93.3%, did timely, mostly 66.7% performed exercise in the morning. 50 % participant did the exercise 2 times in a day and 40% did 3 times in a day. 73.3% patient did 20 repetitions movement in one set.

In this study it is found significant ($p < 0.05$) change mean of difference of pain intensity 2.40 (with sd 1.29) and functional disability was 29.66 (20.04) in experimental group and in control group for pain 2.26 (.79) and functional disability 27.86 (20.02).

In active range of motion of shoulder (AROM) joints mean of the difference found significant ($p < 0.05$) improvement in active flexion 27.66 (with sd 19.35), abduction 38.66 (33.61), medial rotation 21.66 (17.28) and lateral rotation 25.66 (18.11) in experimental and in control groups active flexion 18.00 (11.46), abduction 22.66 (16.56), medial rotation 19.00 (13.25) and lateral rotation 18.33 (12.91).

Similarly passive range of motion (PROM) of shoulder joints mean of the difference showed significant ($p < 0.05$) improvement of passive flexion 25.33 (17.97), abduction 29.00 (26.06), medial rotation 23.66 (17.67) and lateral rotation 25.66 (18.50) in experimental and in control group passive flexion 14.00 (9.29), abduction 20.66 (17.91), medial rotation 14.00 (12.70) and lateral rotation 17.66 (11.62).

Moreover active range of motion (AROM) of shoulder girdle the mean difference found to be significant ($p < 0.05$) improvement of active forward elevation was 3.33 (3.08), external rotation 6.33 (6.11), active internal rotation 12.66 (14.98), cross body adduction 6.33 (6.39) in experimental and in control group active forward elevation was 4.33 (3.20), external rotation 10.00 (5.97), active internal rotation 12.00 (6.21), cross body adduction 8.00 (5.91). within bracket information indicate standard deviation.

Similarly Deshmukh et al. (2014) stated compare the efficacy of treatment strategies - Myofascial release Arm-pull technique and Maitland's joint mobilization technique in patients with adhesive capsulitis. 30 subjects were selected and randomly allocated into 2 Groups, Group I: Control Group - Maitland's mobilization + Exercises, Group II:

Experimental Group - MFR Arm pull + Maitland's mobilization + Exercises. Treatment duration was 3 weeks for both groups. Statistical analysis showed significant difference in Myofascial release Arm pull technique compare with Maitland's mobilization in respect to pain, function and range of motion (ROM).

In addition Yang Jet el. (2012) mentioned that insufficient scapulahumeral rhythm and posterior tipping of the scapula during arm elevation are important to consider in rehabilitation of patients with adhesive capsulitis. So that 34 subjects with frozen shoulder syndrome were included. Randomly 11 subjects were assigned to the control group and 23 subjects assigned to the criteria-control group (experimental group) with a standardized physical therapy program or to the end-range mobilization/scapular mobilization treatment approach. The treatment session is twice a week for 8 weeks. Range of motion (ROM) and disability score were measured at the beginning, 4 weeks and 8 weeks. Subjects in the end-range mobilization/scapular mobilization treatment approach group (experimental group) experienced greater improvement than control group at 4 weeks. Usage of scapular mobilization exercise with soft tissue release technique and static progressive stretch device has a beneficial long-term effect on shoulder range of motion, pain and functional outcomes in patients with adhesive capsulitis of the shoulder.

In this study result shows that outcome of both groups (control and experimental) was good. Within group analysis the mean pre test and post test analysis shows for both the group a significant outcome in pain reduction, improve range of motion and functional activities. But between groups analysis no significant outcome between experimental

group (MFR plus conventional physiotherapy) and control group (only conventional physiotherapy) were found. So individually in both groups it is found positive outcome in term of pain reduction and disability. But this experimental study didn't found any superior effect in experimental group (myofascial release technique plus conventional physiotherapy) over the control group (conventional physiotherapy). So it would be confine that myofascial release technique along with conventional physiotherapy is not much more effective than traditional physiotherapy (conventional physiotherapy) for adhesive capsulitis of shoulder joints patients' in perspective to Bangladesh. It may be happened as we conducted our study on a very small number of sample participants. May be if the sample were larger we may get a different result.

The sample size is really very small, so the result is difficult to generalize for total population.

The result of the study have indentified the effectiveness of Myofascial release technique (MFR) along with conventional physiotherapy and only conventional physiotherapy both are effective in pre test and post test result score during within group analysis of adhesive capsulitis of shoulder joints. In both groups decrease pain, increase range of motion (ROM) and improve functional activities after treatment. But between groups analysis there has no significant outcome between experimental (MFR plus conventional physiotherapy) and control group (only conventional physiotherapy).

Adhesive Capsulitis is a global gleno-humeral disease that just not affects a specific joint but also the entire complex. The manifestations are not only pain but also limitation in movements and restriction to activities of daily living. In clinical practice, physiotherapists preferred by applying manual therapy, exercise therapy, electrotherapy and formal education program for control the problem and improve the conditions. From this study, the researcher has identified the specific variables and comparison of their improvement rates. This will aid the professionals to decide the specific evidence based protocol for applying interventions in Adhesive capsulitis.

There is very limited evidence on myofascial release technique (MFR) on adhesive capsulitis of shoulder joints. As a consequence of this study it is recommended to do further study with large number of subjects and with a longer time peri

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Appendix- A

Institutional Review Board (IRB) Letter



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

(The Academic Institute of CRP)

Ref.

Date: 23/04/18

CRP-BHPI/IRB/04/18/207

To
Ratan Kumar Das
Part II, M.Sc. in Physiotherapy
Session: 2016-17, DU Reg. No: 2568
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of the thesis proposal- “A comparison of myofascial release (MFR) technique along with conventional physiotherapy and only conventional physiotherapy in patients with adhesive capsulitis of shoulder joint” by ethics committee.

Dear Ratan Kumar Das

Congratulations.

The Institutional Review Board (IRB) of BHPI has reviewed and discussed your 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 & Bangla version)
3	Information sheet & consent form.

Since the study involves answering a questionnaire that takes about 15-20 minutes 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 9.00 AM on October 20, 2017 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

সিআরপি-চাপাইন, সাভার, ঢাকা-১৩৪৩, বাংলাদেশ, ফোন : ৭৭৪৫৪৬৪-৫, ৭৭৪১৪০৪ ফ্যাক্স : ৭৭৪৫০৬৯

CRP-Chapain, Savar, Dhaka-1343, Tel : 7745464-5, 7741404, Fax : 7745069, E-mail : contact@crp-bangladesh.org, www.crp-bangladesh.org

Appendix- B
Permission Letter

Permission letter

Date: January 14, 2018

Head

Department of Physiotherapy

Center for the rehabilitation of the Paralysed (CRP)

Chapain, Savar, Dhaka-1343

Through: Coordinator M. Sc. in Physiotherapy Program, BHPI, CRP, Savar, Dhaka.

Subject: Prayer for permission to collect data in order to conduct a thesis.

Sir,

With due respect, I am Ratan Kumar Das, a student of Part-II M. Sc. in Physiotherapy program at Bangladesh Health Professions Institute (BHPI). As per course curriculum, I shall have to complete a thesis. In this respect, my thesis titles "A comparison of myofascial Trigger Point Release (MFR) technique along with conventional physiotherapy and only conventional physiotherapy in patients with adhesive capsulitis of shoulder joints". In this thesis, my participants will be patients who are suffering from adhesive capsulitis of shoulder joints. I believe outdoor musculoskeletal unit of physiotherapy department in CRP, Savar is the best place to collect data from participants. Data collection will require the patients and a small space of your reputed unit and will continue for 8 weeks from 15th January 2018. Data collector will received inform consent from all participants and kept it confidential. In addition, data collector would be graduate physiotherapists who are currently working in this unit. In order to complete of the thesis, I need permission to collect data and cooperation from those physiotherapist.

May I therefore, hope that you would be kind enough to give me permission for data and oblige thereby.

Sincerely Yours

RKD
14.01.18

Ratan Kumar Das

Student of Part-II M. Sc. in Physiotherapy Program

BHPI, CRP, Savar, Dhaka-1343

Session: 2016-2017

FM
14/01/18

Firoz Ahmed Mamin
MSc in Clinical Neurophysiology (London)
Assistant Professor
Department of Physiotherapy
BHPI CRP, Savar, Dhaka

Approved
Please contact with
Mr. Shubul Islam, SPD
incharge, PT Dept - CRP
as a coordi part of
data collection process.

AMH
14/1/18

Mohammad Anwar Hossain
Associate Professor & Head
Physiotherapy Dept., CRP
CRP-Chapain, Savar, Dhaka-1343

Appendix- C

মৌখিক সম্মতিপত্র

আসসালামু আলাইকুম/ নমঃস্কার,

আমি রতন কুমার দাস, আমি এই গবেষণা প্রকল্পটি করছি যা আমার ফিজিওথেরাপিতে স্নাতকোত্তর কার্যক্রম এর অংশ যার শিরোনাম ‘যে সকল রোগীদের কাঁধের সংযোগস্থলগুলিতে অ্যাডহেসিভ ক্যাপসুলাইটিস আছে তাদের উপর মায়োফ্যাসিয়াল রিলিজ (এমএফআর) পস্থারসাথে প্রচলিত ফিজিওথেরাপি এবং শুধুমাত্র প্রচলিত ফিজিওথেরাপির প্রয়োগের মাঝে একটি তুলনা করব । এর মাধ্যমে আমি যে সকল রোগীদের অ্যাডহেসিভ ক্যাপসুলাইটিস আছে তাদের উপর মায়োফ্যাসিয়াল ট্রিগার পয়েন্ট রিলিজ (এমএফআর) পস্থার প্রভাব জানতে আগ্রহী। এখন আমি আপনাকে কিছু ব্যক্তিগত , ব্যথাজনিত এবং বিকলতা বিষয়ক প্রশ্ন করবো। এতে মোটামুটি ১০ – ১৫ মিনিট লাগবে।

আমি আপনাকে অবহিত করতে চাই যে, এটি একটি সম্পূর্ণ একাডেমিক গবেষণা এবং অন্য কোন উদ্দেশ্যের জন্য এটি ব্যবহার করা হবে না। গবেষণায় আপনার অংশগ্রহণ আপনার বর্তমান অথবা ভবিষ্যৎ চিকিৎসার উপর কোন প্রভাব ফেলবে না। আপনার প্রদত্ত সমস্ত তথ্য গোপন থাকবে এবং কোন রিপোর্ট বা প্রকাশনার ক্ষেত্রে এর উৎস গোপন থাকবে।

এই গবেষণায় আপনার অংশগ্রহণ স্বেচ্ছাধীন এবং আপনি কোন নেতিবাচক প্রশ্ন ছাড়াই যে কোন সময় এই গবেষণা থেকে নিজেকে প্রত্যাহার করে নিতে পারবেন। আপনার অধিকার আছে কোন প্রশ্নের উত্তর না দেয়ার বা আপনার পছন্দ মত বা ইচ্ছামত উত্তর দেয়ার।

যদি আপনার এই গবেষণা সম্পর্কে অথবা অংশগ্রহণকারী হিসেবে কিছু জানার থাকে তবে , আপনি আমার সাথে যোগাযোগ করতে পারেন অথবা আমার গবেষণা কর্মকর্তা , প্রফেসর ডঃ মোঃ ফরহাদ হোসাইন , পরিসংখ্যান বিভাগ , জাহাঙ্গীরনগর বিশ্ববিদ্যালয়, সাতার, ঢাকা।

সাক্ষাত্কার সামনে এগিয়ে নেয়ার জন্য আপনার সম্মতি আছে কি ?

তাহলে এই সাক্ষাত্কারে আমি আপনার সম্মতি পেলাম ?

হ্যাঁ না

অংশগ্রহণকারীর স্বাক্ষর এবং তারিখ

সাক্ষাত্কারগ্রহণকারীর স্বাক্ষর এবং তারিখ

ফিজিওথেরাপিস্টের স্বাক্ষর এবং তারিখ

Consent Form (English)

Assalamualaikum/Namosker,

I am Ratan Kumar Das, I am conducting this thesis for M Sc in Physiotherapy program titled **“A comparison of myofascial Release (MFR) technique along with conventional physiotherapy and only conventional physiotherapy in patients with adhesive capsulitis of shoulder joints”** by this I would like to know the effect of myofascial release technique (MFR) for patient with adhesive capsulitis. Now I want to ask some personal, pain and disability related question. This will take approximately 10-15minutes.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. Your participation in the research will have no impact on your present or future treatment in the area. All information provided by you will be treated as confidential and in the event of any report or publication it will be ensured that the source of information remains secret.

Your participation in this study is voluntary and you may withdraw yourself at any time during this study without any negative questions. 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 or your right as a participant, you may contact with me and/or my research supervisor, Prof Dr Md Forhad Hossain, Department of Statistics, Jahangirnagar University, Savar, Dhaka.

Do you have your consent to proceed with the interview?

So may I have your consent to proceed with the interview?

Yes

No

Signature and date of the Participant

Signature and date of the Interviewer

Signature and date of the Physiotherapist

Appendix- D

প্রশ্নাবলী(বাংলা)

‘যে সকল রোগীদের কাঁধের সংযোগস্থলগুলিতে অ্যাডহেসিভ ক্যাপসুলাইটিস আছে তাদের উপর মায়োফ্যাসিয়াল রিলিজ (এমএফআর) পন্থারসাথে প্রচলিত ফিজিওথেরাপি এবং শুধুমাত্র প্রচলিত ফিজিওথেরাপির প্রয়োগের মাঝে একটি তুলনা করব।’

ব্যক্তিগত বিবরণীঃ

সাক্ষাৎকারের তারিখঃ

কোড নংঃ

উত্তরদাতার নামঃ

বয়সঃ

লিঙ্গঃ

ঠিকানাঃ

মোবাইল নংঃ

বিভাগ – ক : বিষয়ভিত্তিক / সামাজিকজনসংখ্যা-বিষয়কতথ্যাবলি

এই প্রশ্নাবলী তৈরি করা হয়েছে সেসকল রোগীদের ব্যথার পরিমাণ নির্ণয় করার জন্য যাদের কাঁধের সংযোগস্থলগুলিতে অ্যাডহেসিভ ক্যাপসুলাইটিস রয়েছে এবং এই বিভাগের প্রতিটি নির্দিষ্ট অংশের বাম পাশে রোগী নিজে টিক (✓) চিহ্ন দিয়ে পূরণ করবে কিন্তু বিশেষ বিবেচনায় ফিজিওথেরাপিস্ট কালো বা নীল কলম ব্যবহার করে পূরণ করবেন।

প্রশ্নের নম্বর	প্রশ্ন / তথ্যের বিষয়	অংশ গ্রহণকারীর উত্তর
১	বয়সবছর
২	লিঙ্গ	
৩	উচ্চতা	বিএমআই
৪	ওজন	
৫	বৈবাহিক অবস্থা	<input type="radio"/> বিবাহিত = ১ <input type="radio"/> অবিবাহিত = ২ <input type="radio"/> তালাকপ্রাপ্ত = ৩ <input type="radio"/> বিধবা = ৪ <input type="radio"/> আলাদাবসবাস = ৫ <input type="radio"/> অন্যান্য = ৬
৬	শিক্ষাবিষয়ক অবস্থা	<input type="radio"/> অশিক্ষিত = ১

		<ul style="list-style-type: none"> ○ প্রাথমিক = ২ ○ এস এস সি = ৩ ○ এইছ এস সি = ৪ ○ স্নাতক = ৫ ○ মাস্টার্স = ৬ ○ স্নাতকোত্তর = ৭
৭	পেশা	<ul style="list-style-type: none"> ○ কৃষক = ১ ○ দিনমজুর = ২ ○ চাকুরীজীবী = ৩ ১ সরকারি ২ বেসরকারি ○ ব্যবসায়ী = ৪ ○ গার্মেন্টস শ্রমিক = ৫ ○ চালক = ৬ ○ রিকশাচালক = ৭ ○ গৃহিণী = ৮ ○ শিক্ষক = ৯ ○ বেকার = ১০ ○ অন্যান্য = ১১
৮	জীবিকার ধরণ / কাজের ধরণ	<ul style="list-style-type: none"> ○ বসে থেকে কাজ = ১ ○ পরিশ্রমের কাজ = ২ ○ গৃহস্থালির কাজ = ৩
৯	বসবাসের জায়গা	<ul style="list-style-type: none"> ○ শহর = ১ ○ গ্রাম = ২ ○ উপশহর = ৩
১০	বেশির ভাগ সময় কাজ করার ভঙ্গী	<ul style="list-style-type: none"> ○ বসা থেকে = ১ ○ দাঁড়িয়ে থেকে = ২ ○ হাঁটা অবস্থায় = ৩ ○ ভ্রমণের সহিত = ৪ ○ অন্যান্য (.....)
১১	<ul style="list-style-type: none"> ○ ধূমপান = ১ ○ মদ্যপায়ী = ২ 	<ul style="list-style-type: none"> ১ হ্যাঁ ২ না ১। হ্যাঁ ২। না
১২	কোন আঘাতের ঘটনা? হ্যাঁ/ না, যদি হ্যাঁ হয় তবে	<ul style="list-style-type: none"> ○ সরাসরি আঘাত = ১ ○ অধিক ব্যবহার জনিত আঘাত = ২ ○ মানসিক আঘাত = ৩
১৩	আপনার দীর্ঘস্থায়ী কোন অসুখ আছে?	<ul style="list-style-type: none"> ○ ডায়াবেটিস ম্যালাইটাস = ১ ○ উচ্চরক্তচাপ = ২ ○ হৃদরোগ = ৩ ○ স্থূলতা = ৪ ○ অন্যান্য (উল্লেখকরুন)= ৫

১৪	কি ধরণের চিকিৎসা নিয়েছেন?	<input type="radio"/> ঔষধসম্পর্কিত চিকিৎসা = ১ <input type="radio"/> ফিজিওথেরাপি = ২ <input type="radio"/> ব্যথা নাশক ঔষধ = ৩ <input type="radio"/> সবসময় ব্যবহৃত ঔষধ = ৪ <input type="radio"/> অন্যান্য = ৫
----	----------------------------	---

চিকিৎসারপর্বে (প্রাক – নির্বাচনী)

বিভাগ – খ : ব্যথারঅবস্থা

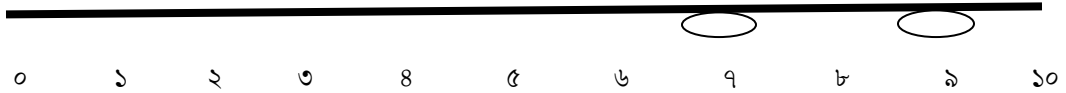
ব্যথা পরিমাপের জন্যসংখ্যাসূচকব্যথানির্ধারণী স্কেল

এই প্রশ্নাবলী তৈরি করা হয়েছে অ্যাডহেসিভ ক্যাপসুলাইটিস রোগীদের জন্য। ম্যাককফারী এট আল (১৯৯৯), একটি সংখ্যা সূচক স্কেল ব্যবহার করেন রোগীরা কি পরিমাণ ব্যথা অনুভব করে তা পরিমাপ করার জন্য। এটা সংখ্যাসূচক ব্যথানির্ধারণী স্কেল নামে পরিচিত। এটি ১০ সেন্টিমিটার লম্বা একটি স্কেল যাতে ০ -১০ পর্যন্ত লেখা থাকে। এখানে ০ নামে কোন ব্যথা নাই, ১ -৩ অল্প ব্যথাজনিত অবস্থা, ৩ - ৫ মাঝারি ব্যথা জনিত অবস্থা এবং ৬ - ১০ সবচেয়ে খারাপ অনুভূতি সম্পন্ন ব্যথার অবস্থা যা একজন রোগী অনুভব করে। প্রশ্নাবলির এই বিভাগের প্রতিটি নির্দিষ্ট অংশ রোগী নিজে কালো বা নীল কলম ব্যবহার করে পূরণ করবে।

শূন্য (০) মানে কোন ব্যথা নাই, (১ - ৩) মানে অল্প ব্যথা, (৪-৬) মানে মাঝারি ব্যথা এবং (৭-১০) মানে তীব্র ব্যথা। যদি রোগীর কোন প্রশ্ন বুঝতে সমস্যা হয় তাহলে ফিজিওথেরাপিস্ট তাকে সে বিষয়টি বুঝিয়ে দিতে পারেন।

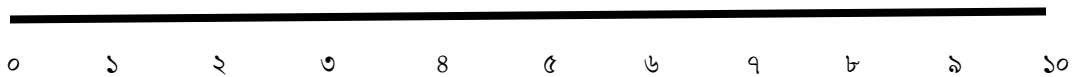
আপনি কাঁধে গড়ে যে ব্যথা অনুভব করেন তা ০ – ১০এর মাঝে যে সংখ্যাটির দ্বারা সবচেয়ে ভাল বর্ণনাকরে তাতে গোল দাগ দিন। শূন্য (০) মানে কোন ব্যথা নাই এবং দশ (১০) মানে সবচেয়ে খারাপ অনুভূতি সম্পন্ন ব্যথা যা আপনি অনুভব করেছেন।

যেমন : যদি কোন অংশ গ্রহণকারীর সংখ্যাসূচক ব্যথা নির্ধারণী স্কেলে ৭ থেকে ৯ এর মাঝে ব্যথা থাকে তবে তিনি পূরণ করবেন :



শূন্য (০) মানে কোন ব্যথা নাই (১-৩) মানে অল্প ব্যথা (৪-৬) মানে মাঝারি ব্যথা এবং (৭-১০) মানে তীব্র ব্যথা।

আজ আপনার ব্যথা কতটুকু খারাপ পর্যায়ে আছে?



বিভাগ – গঃ রেঞ্জ অব মোশন নির্ণয়

গনিওমিটার ব্যবহার করে রেঞ্জ অব মোশন নির্ণয়ঃ

কাঁধ বন্ধনীঃ

রেঞ্জ অব মোশন	ডান		বাম	
	নিজে	সহায়তা নিয়ে	নিজে	সহায়তা নিয়ে
কাঁধ সামনে ঝুকানো(হাত ও কোমর সর্বাধিকবাকিয়ে)				
হাত বাহিরের দিকে ঘুরানো (হাত শরীরের পাশে রেখে)				
হাত বাহিরেরদিকেঘুরানো (হাত পাশে ৯০°উপরে তুলে)				
হাত ভিতরের দিকে ঘুরানো (পিঠের পিছনের দিকে হাতের বৃদ্ধাঙ্গুলি সর্বাধিক যতদূর যায়)				
হাত শরীরের একপাশ থাকে অপর পাশে আড়াআড়ি নেয়া (একপাশের কনুই অপর পাশের কাঁধ বরাবর যাবে)				

কাঁধের সংযোগস্থল (গ্লেনো-হিউমেরাল জয়েন্ট)

রেঞ্জঅবমোশন কাঁধের নড়াচড়া	ডান		বাম	
	নিজে	সহায়তা নিয়ে	নিজে	সহায়তা নিয়ে
হাত সামনের দিকে উপরে ভাঁজ করা				
হাত পিছনে প্রসারিত করা				
হাত পাশ বরাবর উপরে তোলা				
হাত শরীরের দিকে নিয়া আসা				
হাত ভাঁজ করে শরীরের দিকে ঘুরাতে পারা				
হাত ভাঁজ করে শরীর থেকে বাহিরের দিকে ঘুরাতে পারা				

বিভাগ – ঘঃ কার্যকরী কার্যক্রমের পরিমাণ

Disability scale by Shoulder Pain and Disability Index (SPADI)

গত সপ্তাহে আপনার কাঁধের সমস্যাটির কারণে আপনি যা অনুভব করেছেন তা সর্বোত্তম ভাবে প্রকাশ করে এমন একটি লাইনের উপর একটি চিহ্ন দিন।

ব্যথার পরিমাপক

আপনার ব্যথা এখন কেমন?

যে সংখ্যাটিকে আপনার ব্যথার জন্য সঠিক পরিমাপক মনে হবে তাতে গোল দিনঃ 0 = কোন ব্যথা নাই এবং ১০ = কল্পনার থেকেও খারাপ ব্যথা

যখন এটি তীব্র?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
যখন আঘাত প্রাপ্ত পাশের দিকে ফিরে শুয়ে থাকেন?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
উপরের তাকে রাখা কিছু ধরতে গেলে?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
ঘাড়ের পিছনে হাত দিয়ে ধরতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
আঘাতপ্রাপ্ত হাত দিয়ে কিছুকে ঠেলতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
উপরের তাকে কিছু রাখতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০

সর্বমোট ব্যথার মান / ৫০ x ১০০ = %

(বিঃ দ্রঃ যদি কোনও ব্যক্তি মোট সম্ভাব্য স্কোর দ্বারা ভাগকৃত সমস্ত প্রশ্নের উত্তর না করে, উদাহরণ স্বরূপ, যদি ১ কে ৪০ দ্বারা গুন করে ভাগ করা হয়)

আপনার এখন কি রকম সমস্যা হয়?

যে সংখ্যাটিকে আপনার ব্যথার জন্য সঠিক পরিমাপক মনে হবে তাতে গোল দিন যেখানেঃ ০ = কোন সমস্যা নাই এবং ১০ = এত সমস্যা যে সাহায্যের দরকার পরে

চুল পরিষ্কার করতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
পিঠ পরিষ্কার করতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
গ্যাঞ্জি বা জাম্পার পরতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
শার্ট পরতে পারা যার সামনে বোতাম আছে?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
প্যান্ট পরতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
উপরের তাকে কোন কিছু রাখতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
১০ পাউন্ড (সাড়ে ৪ কেজি) এর কোন বস্তু বহন করতে পারা ?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
পিছনের পকেট থেকে কিছু বের করতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০

সর্বমোট অক্ষমতার মানঃ _____ / ৮০ x ১০০ = %

(বিঃদ্রঃ যদি কোন ব্যক্তি মোট সম্ভাব্য স্কোর দ্বারা ভাগকৃত সমস্ত প্রশ্নের উত্তর না করে, উদাহরণ স্বরূপ, যদি ১কে ৭০ দ্বারা গুন করে ভাগ করা হয়)

সর্বমোট স্প্যাডি স্কোরঃ _____ / ১৩০ x ১০০ = %

(বিঃদ্রঃ যদি কোন ব্যক্তি মোট সম্ভাব্য স্কোর দ্বারা ভাগকৃত সমস্ত প্রশ্নের উত্তর না করে, উদাহরণ স্বরূপ, যদি ১ কে ১২০ দ্বারা গুন করে ভাগ করা হয়)

ন্যূনতম সনাক্ত যোগ্য পরিবর্তন (৯০% আস্থার সাথে) = ১৩ পয়েন্ট

(পরিবর্তন এর থেকে কম হলে একে পরিমাপ ত্রুটি বলে গণ্য করা হবে)

Source: Roach et al. (1991). Development of a shoulder pain and disability index

কোডনংঃ

চিকিৎসার পর (পরবর্তী অবস্থা)

বিভাগ – ৩ঃ ব্যথার অবস্থা

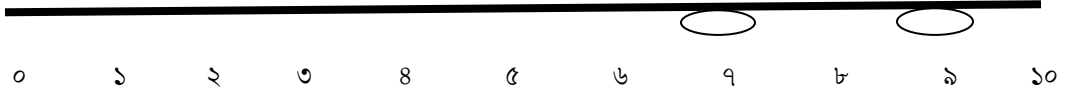
ব্যথা পরিমাপের জন্য সংখ্যা সূচক ব্যথা নির্ধারনী স্কেল

এই প্রশ্নাবলী তৈরি করা হয়েছে অ্যাডহেসিভ ক্যাপসুলাইটিস রোগীদের জন্য। ম্যাককফারী এট আল (১৯৯৯), একটি সংখ্যা সূচক স্কেল ব্যবহার করেন রোগীরা কি পরিমাণ ব্যথা অনুভব করে তা পরিমাপ করার জন্য। এটা সংখ্যা সূচক ব্যথা নির্ধারনী স্কেল নামে পরিচিত। এটি ১০ সেন্টিমিটার লম্বা একটি স্কেল যাতে ০ -১০ পর্যন্ত লেখা থাকে। এখানে ০ নামে কোন ব্যথা নাই, ১-৩ অল্প ব্যথাজনিত অবস্থা, ৩-৫ মাঝারি ব্যথা জনিত অবস্থা এবং ৬-১০ সবচেয়ে খারাপ অনুভূতি সম্পন্ন ব্যথার অবস্থা যা একজন রোগী অনুভব করে। প্রশ্নাবলির এই বিভাগের প্রতিটি নির্দিষ্ট অংশ রোগী নিজে কালো বা নীল কলম ব্যবহার করে পূরণ করবে।

শূন্য (০) মানে কোন ব্যথা নাই, (১-৩) মানে অল্প ব্যথা, (৪-৬) মানে মাঝারি ব্যথা এবং (৭-১০) মানে তীব্র ব্যথা। যদি রোগীর কোন প্রশ্ন বুঝতে সমস্যা হয় তাহলে ফিজিওথেরাপিস্ট তাকে সে বিষয়টি বুঝিয়ে দিতে পারেন।

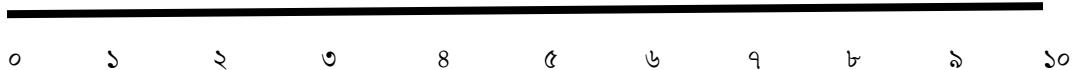
আপনি কাঁধে গড়ে যে ব্যথা অনুভব করেন তা ০-১০ এর মাঝে যে সংখ্যাটির দ্বারা সবচেয়ে ভাল বর্ণনা করে তাতে গোল দাগ দিন। শূন্য (০) মানে কোন ব্যথা নাই এবং দশ (১০) মানে সবচেয়ে খারাপ অনুভূতি সম্পন্ন ব্যথা যা আপনি অনুভব করেছেন।

যেমন : যদি কোন অংশ গ্রহণ কারীর সংখ্যা সূচক ব্যথা নির্ধারনী স্কেলে ৭ থেকে ৯ এর মাঝে ব্যথা থাকে তবে তিনি পূরণ করবেন :



শূন্য (০) মানে কোন ব্যথা নাই (১-৩) মানে অল্প ব্যথা (৪-৬) মানে মাঝারি ব্যথা এবং (৭-১০) মানে তীব্র ব্যথা।

আজ আপনার ব্যথা কতটুকু খারাপ পর্যায়ে আছে?



বিভাগ – চঃ রেঞ্জ অব মোশন নির্ণয়

গনিওমিটার ব্যবহার করে রেঞ্জ অব মোশন নির্ণয়ঃ

কাঁধ বন্ধনীঃ

রেঞ্জ অব মোশন	ডান		বাম	
	নিজে	সহায়তা নিয়ে	নিজে	সহায়তা নিয়ে
কাঁধ সামনে ঝুঁকানো (হাত ও কোমর সর্বাধিক বাকিয়ে)				
হাত বাহিরের দিকে ঘুরানো (হাত শরীরের পাশে রেখে)				
হাত বাহিরের দিকে ঘুরানো (হাত পাশে ৯০° উপরে তুলে)				
হাত ভিতরের দিকে ঘুরানো (পিঠের পিছনের দিকে হাতের বৃদ্ধাঙ্গুলি সর্বাধিক যতদূর যায়)				
হাত শরীরের একপাশ থাকে অপর পাশে আড়াআড়ি নেয়া (একপাশের কনুই অপর পাশের কাঁধ বরাবর যাবে)				

কাঁধের সংযোগস্থল (গ্লেনো-হিউমেরাল জয়েন্ট)

রেঞ্জ অব মোশন কাঁধের নড়াচড়া	ডান		বাম	
	নিজে	সহায়তা নিয়ে	নিজে	সহায়তা নিয়ে
হাত সামনের দিকে উপরে ভাঁজ করা				
হাত পিছনে প্রসারিত করা				
হাত পাশ বরাবর উপরে তোলা				
হাত শরীরের দিকে নিয়া আসা				
হাত ভাঁজ করে শরীরের দিকে ঘুরাতে পারা				
হাত ভাঁজ করে শরীর থেকে বাহিরের দিকে ঘুরাতে পারা				

বিভাগ –ছঃ কার্যকরী কার্যক্রমের পরিমাণ

Disability scale by Shoulder Pain and Disability Index (SPADI)

গত সপ্তাহে আপনার কাঁধের সমস্যাটির কারণে আপনি যা অনুভব করেছেন তা সর্বোত্তম ভাবে প্রকাশ করে এমন একটি লাইনের উপর একটি চিহ্ন দিন।

ব্যথার পরিমাপক

আপনার ব্যথা এখন কেমন ?

যে সংখ্যাটিকে আপনার ব্যথার জন্য সঠিক পরিমাপক মনে হবে তাতে গোল দিনঃ ০ = কোন ব্যথা নাই এবং ১০ = কল্পনার থেকেও খারাপ ব্যথা

যখন এটি তীব্র ?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
যখন আঘাত প্রাপ্ত পার্শ্বের দিকে ফিরে শুয়ে থাকেন?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
উপরের তাকে রাখা কিছু ধরতে গেলে ?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
ঘাড়ের পিছনে হাত দিয়ে ধরতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
আঘাতপ্রাপ্ত হাত দিয়ে কিছুকে ঠেলতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
উপরের তাকে কিছু রাখতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০

সর্বমোট ব্যথার মান / ৫০ x ১০০ = %

(বিঃ দ্রঃ যদি কোনও ব্যক্তি মোট সম্ভাব্য স্কোর দ্বারা ভাগকৃত সমস্ত প্রশ্নের উত্তর না করে, উদাহরণ স্বরূপ, যদি ১ কে ৪০ দ্বারা গুন করে ভাগ করা হয়)

আপনার এখন কি রকম সমস্যা হয় ?

যে সংখ্যাটিকে আপনার ব্যথার জন্য সঠিক পরিমাপক মনে হবে তাতে গোল দিন যেখানেঃ ০ = কোন সমস্যা নাই এবং ১০ = এত সমস্যা যে সাহায্যের দরকার পরে

চুল পরিষ্কার করতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
পিঠ পরিষ্কার করতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
গ্যাজি বা জাম্পার পরতে পারা ?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
শার্ট পরতে পারা যার সামনে বোতাম আছে?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
প্যান্ট পরতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
উপরের তাকে কোন কিছু রাখতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
১০ পাউন্ড (সাড়ে ৪ কেজি) এর কোন বস্তু বহন করতে পারা ?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০
পিছনের পকেট থেকে কিছু বের করতে পারা?	০	১	২	৩	৪	৫	৬	৭	৮	৯	১০

সর্বমোট অক্ষমতার মানঃ _____ / ৮০ x ১০০ = %

(বিঃদ্রঃ যদি কোন ব্যক্তি মোট সম্ভাব্য স্কোর দ্বারা ভাগকৃত সমস্ত প্রশ্নের উত্তর না করে, উদাহরণ স্বরূপ, যদি ১কে ৭০ দ্বারা গুন করে ভাগ করা হয়)

সর্বমোট স্প্যাডি স্কোরঃ _____ / ১৩০ x ১০০ = %

(বিঃদ্রঃ যদি কোন ব্যক্তি মোট সম্ভাব্য স্কোর দ্বারা ভাগকৃত সমস্ত প্রশ্নের উত্তর না করে, উদাহরণ স্বরূপ, যদি ১ কে ১২০ দ্বারা গুন করে ভাগ করা হয়)

ন্যূনতম সনাক্ত যোগ্য পরিবর্তন (৯০% আস্থার সাথে) = ১৩ পয়েন্ট

(পরিবর্তন এর থেকে কম হলে একে পরিমাপ ত্রুটি বলে গণ্য করা হবে)

Source: Roach et al. (1991). Development of a shoulder pain and disability index

বিভাগ –এঃ বাড়িতে করা ব্যায়ামের ফলাফলের পরিমাপ

নিচের প্রশ্নগুলো বাড়িতে করা ব্যায়ামের ফলাফলের উপর ভিত্তি করে হবে। এই বিভাগের প্রতিটি নির্দিষ্ট অংশের বাম পাশে রোগী নিজে টিক (✓) চিহ্ন দিয়ে পূরণ করবে কিন্তু বিশেষ বিবেচনায় ফিজিওথেরাপিস্ট কালো বা নীল কলম ব্যবহার করে পূরণ করবেন।

১	আপনি কি ব্যায়াম করেন ?	<input type="radio"/> হ্যাঁ = ১ <input type="radio"/> না = ২ <input type="radio"/> মাঝে মধ্যে () = ৩
২	আপনি কি ব্যায়ামগুলো সময়মত করেন ? (যেভাবে বলা হয়েছে), যদি হ্যাঁ হয়, তবে নিচের ৩টি প্রশ্ন পূরণ করুন	<input type="radio"/> হ্যাঁ = ১ <input type="radio"/> না = ২
৩	সাধারণত কখন আপনি যে ব্যায়ামগুলো করতে বলা হয়েছে সেগুলো করেন ?	<input type="radio"/> সকাল বেলা = ১ <input type="radio"/> দুপুর বেলা = ২ <input type="radio"/> বিকেল বেলা = ৩ <input type="radio"/> সন্ধ্যা বেলা = ৪ <input type="radio"/> রাতের বেলা = ৫ <input type="radio"/> অন্যান্য () = ৬
৪	দিনে কয়বার করেন ?	<input type="radio"/> ১ বেলা = ১ <input type="radio"/> ২ বেলা = ২ <input type="radio"/> ৩ বেলা = ৩ <input type="radio"/> ৪ বেলা = ৪ <input type="radio"/> ৫ বেলা = ৫ <input type="radio"/> অন্যান্য () = ৬
৫	প্রতি বারে কয়বার করে করা হয় ?	<input type="radio"/> ৫বার = ১ <input type="radio"/> ১০বার = ২ <input type="radio"/> ১৫বার = ৩ <input type="radio"/> ২০বার = ৪ <input type="radio"/> ৩০বার এবং তার বেশি = ৫

Questionnaire (English)

A comparison of myofascial Release (MFR) technique along with conventional physiotherapy and only conventional physiotherapy in patients with adhesive capsulitis of shoulder joints.

Personal details:

Date of interview:

Code No:

Name of the respondent:

Age:

Sex:

Address:

Mobile No:

SECTION-A: Subjective/ Socio Demographic Information

This questionnaire is developed to measure the pain of the patient with adhesive capsulitis of shoulder joints and this section will be filled tick ($\sqrt{\quad}$) mark in the left of point by, patients but in special consideration physiotherapist using a black or blue pen.

Question Number	Questions/Information on	Response of the participant	
1.	Age years	
2	Sex		
3	Height		BMI
4	Weight		
6	Marital status	<input type="radio"/> Married = 1 <input type="radio"/> Unmarried=2 <input type="radio"/> Divorced =3 <input type="radio"/> Widow =4 <input type="radio"/> Separated =5 <input type="radio"/> Others=6	
7	Educational status	<input type="radio"/> Illiterate=1 <input type="radio"/> Primary=2 <input type="radio"/> SSC=3 <input type="radio"/> HSC=4 <input type="radio"/> Graduation=5 <input type="radio"/> Masters=6 <input type="radio"/> Post graduations =7	

8	Occupation	<ul style="list-style-type: none"> ○ Farmer =1 ○ Day labor=2 ○ Service holder=3 <ul style="list-style-type: none"> I. Government II. Non-government ○ Businessman=4 ○ Garments worker=5 ○ Driver =6 ○ Rickshawola=7 ○ Housewife=8 ○ Teacher=9 ○ Unemployment=10 ○ Others=11
9	Life style/ working style	<ul style="list-style-type: none"> ○ Desk job=1 ○ Labor job=2 ○ House keeping=3
10	Living area	<ul style="list-style-type: none"> ○ Urban=1 ○ Rural=2 ○ Semi urban=3
11	Major working position	<ul style="list-style-type: none"> ○ Sitting=1 ○ Standing =2 ○ Walking=3 ○ Traveling=4 ○ Other (.....)
12	<ul style="list-style-type: none"> ○ Smoking =1 ○ Alcoholic =2 	1. Yes 2. No 1. Yes 2. No
13	Any history of trauma? Yes/No, if yes then	<ul style="list-style-type: none"> ○ Direct trauma=1 ○ Over use trauma=2 ○ Psychological trauma=3
14	Do you have any chronic illness	<ul style="list-style-type: none"> ○ Diabetic Mellitus=1 ○ Hypertension (HTN)=2 ○ Heat disease=3 ○ Obesity=4 ○ Others (specify)=5
14	What type of treatments you have tried?	<ul style="list-style-type: none"> ○ Medical treatment=1 ○ Physiotherapy=2 ○ Pain killer=3 ○ Traditional medicine=4 ○ Others =5

Before Treatment (Pre-Test)

SECTION-B: Pain Status

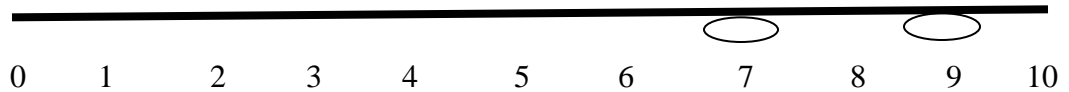
Numeric Pain Rating Scale (NPRS) for pain Measurement

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 colored ball pen.

A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7- 10) means severe pain. If the patient struggles to understand the meaning of a question, physiotherapist is requested to clear the meaning of certain portions.

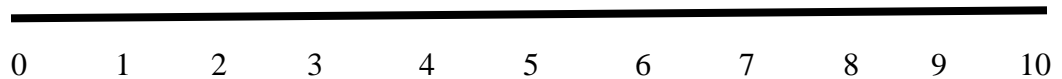
Rate the average amount of pain in your shoulder by encircling the number that best describes your pain on a scale from 0-10. A zero (0) represents no pain and a ten (10) represents worst pain you have ever experienced.

For example- If any participant has pain between 7 to 9 at Numeric Pain Rating Scale than he/ she will fill up:



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

How bad is your pain today?



SECTION-C: Estimate the Range of Motion

Range of Motion measured by Goniometer:

Shoulder Girdle:

Range of Motion	Right		Left	
	Active	Passive	Active	Passive
Forward elevation (maximum arm trunk angle)				
External rotation (arm comfortable at site)				
External rotation (arm at 90° abduction)				
Internal rotation (highest posterior anatomy reached with thumb)				
Cross body adduction (Antecubetal fossa to opposite accromion)				

Shoulder joint (Glanu-humaral Joint):

Range of Motion (Shoulder Movement)	Right		Left	
	Active	Passive	Active	Passive
Flexion				
Extension				
Abduction				
Adduction				
Medial rotation				
Lateral rotation				

SECTION-D: Estimate the Functional activities

Disability scale by 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
Placing an object on a high shelf?	0	1	2	3	4	5	6	7	8	9	10

Total pain score /50 x 100 = %

(Note: If a person does not answer all questions divide by the total possible score, eg. if 1 question missed divide by 40)

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

Total disability score: _____ / 80 x 100 = %

(Note: If a person does not answer all questions divide by the total possible score, eg. if 1 question missed divide by 70)

Total Spadi score: _____ 130 x 100 = %

(Note: If a person does not answer all questions divide by the total possible score, eg if 1 question missed divide by 120)

Minimum Detectable Change (90% confidence) = 13 points

(Change less than this may be attributable to measurement error)

Source: Roach et al. (1991). Development of a shoulder pain and disability index

After Treatment (Post-Test)
SECTION- E: Pain Status

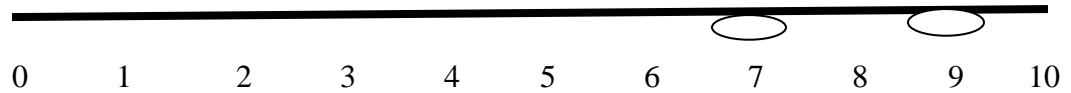
Numeric Pain Rating Scale (NPRS) for pain Measurement

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 colored ball pen.

A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7- 10) means severe pain. If the patient struggles to understand the meaning of a question, physiotherapist is requested to clear the meaning of certain portions.

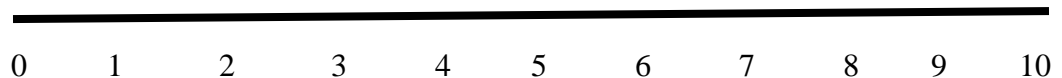
Rate the average amount of pain in your shoulder by encircling the number that best describes your pain on a scale from 0-10. A zero (0) represents no pain and a ten (10) represents worst pain you have ever experienced.

For example- If any participant has pain between 7 to 9 at Numeric Pain Rating Scale than he/ she will fill up:



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

How bad is your pain today?



SECTION-F: Estimate the Range of Motion

Range of Motion measured by Goniometer:

Shoulder Girdle:

Range of Motion	Right		Left	
	Active	Passive	Active	Passive
Forward elevation (maximum arm trunk angle)				
External rotation (arm comfortable at site)				
External rotation (arm at 90° abduction)				
Internal rotation (highest posterior anatomy reached with thumb)				
Cross body adduction (Antecubetal fossa to opposite accromion)				

Shoulder joint (Glanu-humaral Joint):

Range of Motion (Shoulder Movement)	Right		Left	
	Active	Passive	Active	Passive
Flexion				
Extension				
Abduction				
Adduction				
Medial rotation				
Lateral rotation				

SECTION-G: Estimate the Functional activities

Disability scale by 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
Placing an object on a high shelf?	0	1	2	3	4	5	6	7	8	9	10

Total pain score /50 x 100 = %

(Note: If a person does not answer all questions divide by the total possible score, eg. if 1 question missed divide by 40)

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

Total disability score: ____ / 80 x 100 = %

(Note: If a person does not answer all questions divide by the total possible score, eg. if 1 question missed divide by 70)

Total Spadi score: ____ 130 x 100 = %

(Note: If a person does not answer all questions divide by the total possible score, eg if 1 question missed divide by 120)

Minimum Detectable Change (90% confidence) = 13 points

(Change less than this may be attributable to measurement error)

Source: Roach et al. (1991). Development of a shoulder pain and disability index

SECTION-H: Estimate the Home Exercise Performance

Follow up questions about home exercise performance. This section will be filled tick (✓) mark in the left of point by patients but in special consideration physiotherapist using a black or blue pen.

1.	Do you perform exercise regularly?	<input type="radio"/> Yes =1 <input type="radio"/> No =2 <input type="radio"/> Occasionally(.....)=3
2.	Do you perform exercise time to time (as per advised)? if yes then go for 3 question.	<input type="radio"/> Yes =1 <input type="radio"/> No =2
3.	Mostly when you perform advice exercise?	<input type="radio"/> Morning time=1 <input type="radio"/> Noon time=2 <input type="radio"/> Afternoon time=3 <input type="radio"/> Evening time=4 <input type="radio"/> Night time =5 <input type="radio"/> Others (.....)=6
4.	How many times in a day?	<input type="radio"/> 1 time=1 <input type="radio"/> 2 times=2 <input type="radio"/> 3 times=3 <input type="radio"/> 4 times=4 <input type="radio"/> 5 times=5 <input type="radio"/> Others (.....)=6
5.	Repetition of movement in each time	<input type="radio"/> 05 repetitions=1 <input type="radio"/> 10 repetitions=2 <input type="radio"/> 15 repetitions=3 <input type="radio"/> 20 repetitions=4 <input type="radio"/> 30 repetitions & above=5

Appendix- E

Treatment Protocol of Control Group (conventional physiotherapy)



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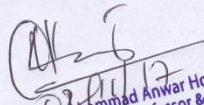
Ref: CRP/PT/2102/29/02.11.2017

Date: 02.11.2017

Conventional physiotherapy for adhesive capsulities of shoulder joints:

There are different types of orthopadies conditions are getting physiotherapy treatment from Musculo-skeletal physiotherapy department. Among them adhesive capsulities is very much common condition. In here, different types of manual therapy alone with electrotherapy are used for treating frozen shoulder patients. The commonly used treatment lists are given below.

1. Active range of motion (AROM) exercise
2. Passive range of motion (PROM) exercise
3. Capsular stretching exercise
4. Shoulder mobilization exercise (Grade A & B)
5. Accessory movement on glenohumeral joint (A-P, P-A, Lateral glide, gapping)
6. Movement with mobilization (MWM) (Mulligan technique)
7. Wall climbing exercise (active assisted exercise)
8. Pully exercise
9. Pendulum exercise
10. Soft tissue mobilization or muscle relaxation exercise
11. Stretching of the shoulder girdle muscle
12. Mobilization of shoulder girdle
13. Muscle energetic technique
14. Strengthening exercise of shoulder
15. Functional activities practice
16. IRR/ UST / TENS
17. Ice compression


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As a donor to CRP you qualify for a tax rebate as the Government of Bangladesh have approved CRP as a Philanthropic Institution from February 2008

Appendix- F

Treatment Protocol of Experimental Group or trail group

- I) Convention physiotherapy**
- II) Myofascial Release Technique (MFR)**

Myofascial Release Technique (MFR):

Myofascial Release is a specialised physical and manual therapy used for the effective treatment and rehabilitation of soft tissue and fascial tension and restrictions. ‘Myo’ means muscle and ‘fascia’ means band. Fascia, an embryological connective tissue is a 3D continuous web of elastin and collagen fibers surrounded by a viscous fluid called the ground substance. These two fiber types allow it to be very strong yet have a high degree of flexibility whilst the ground substance is a fluid transportation medium and acts a slide and glide mechanism between structures.

Definition:

Myofascial therapy can be defined as the facilitation of mechanical, neural and psycho physiological adaptive potential as interfaced via the myofascial system (Kegerreis, S K 1992).

Benefit:

- Increase hydration of the ground substance, the collagen fibres and the whole of fascial system.
- Increase the distance between the collagen fibres
- Restore the elasticity of collagen fibers
- Decrease in compression around other structures

Myofascial release technique:

Scapular release: This technique is designed to mobilize myofascial restrictions on all three borders of the scapula.

Medial Boarder: To release trigger points between the scapula and the thoracic spinous process (levator scapula and rhomboids)

Upper Border: to release upper trapezius

Lateral Border: to release the infraspinatus

Duration of treatment time: 3 and 5 minutes for each border.

Treatment session: Total 4 weeks, 3 session per weeks.

Medial Boarder:

To release between the scapula and the thoracic spinous process.



Release of levator scapula muscle



Release of rhomboids muscle

Upper Border:



Side lying position



Sitting position

Release of upper trapezius muscles

Lateral Border:



Release of the infraspinatus muscle