EFFECTIVENESS OF MYOFASCIAL RELEASE FOR PATIENT WITH TENNIS ELBOW

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We the under signed certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for the acceptance of this dissertation entitled

EFFECTIVENESS OF MYOFASCIAL RELEASE FOR THE PATIENTS WITH TENNIS ELBOW

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

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DECLARATION

I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also decline that for any publication, presentation or dissemination of information of the study. I bound to take written consent of my supervisor and Head of the Physiotherapy Department, BHPI.

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Acronyms

&	And
CRP	Centre for Rehabilitation of Paralyzed
DTFM	Deep Transverse Friction Massage
ECRB	Extensor Carpi Radialis Bravis
ECRL	Extensor Carpi Radialis Longus
ECU	Extensor Carpi Ulnaris
EDC	Extensor Digitorum Communise
LE	Lateral Epicondylitis
MRI	Magnetic Resonance Imagine
MWM	Movement with Mobilization
NSAID	Non-Steroidal Anti Inflammatory Drug
POP	Plaster of Paris
RCT	Randomize Control Trial
ROM	Range of Motion
TENS	Transcutaneous Electrical Nerve Stimulation
UK	United Kingdom
US	Ultrasound
NPRS	Numeric Pain Rating Scale

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Abstract

Purpose: The purpose of the study is to find out the effectiveness of Myofascial release with conventional physiotherapy compare to only conventional physiotherapy for tennis elbow. *Objectives:* To compare pain intensity at rest, at forceful wrist extension, during strong grip, doing a task with repeated arm movement, during cozen test, at resisted middle finger extension, during turn a doorknob or key or open a jar and during palpation at affected site before and after conventional physiotherapy with myofascial release and conventional physiotherapy alone in patients with tennis elbow. *Methodology:* 7 patients with tennis elbow were selected and randomly assigned to myofascial release with conventional physiotherapy group and 7 patients to the only conventional physiotherapy group for this randomize control trial study. The study was conducted at musculoskeletal department of CRP, savar. Numeric Pain Rating Scale was used to measure pain intensity in different functional position. Data was analysed by using Mann Whitney 'U' test and Microsoft Excel Worksheet 2010 was used to decorate data. *Results* - After observing pre-test and post-test score the significant improvement was found. Improvements were statistically significant. Following treatment the study found that the experimental group showed a significant improvement in case of resting pain ($p<.05$), pain at forceful wrist extension ($p<0.05$), pain during strong grip ($p<0.05$), doing a task with repeated arm movement ($p<0.05$), pain on forceful middle finger extension ($p<0.05$), during turn a doorknob or key or open a jar, & pain during palpation ($p<0.05$). Only in case of cozen test, reduction of pain intensity was not found to be significant. *Conclusion:* This experimental study shows that myofascial release with conventional physiotherapy is more effective than conventional physiotherapy alone for patients with tennis elbow.

Key words: Tennis elbow, Myofascial release, conventional physiotherapy.

CHAPTER-I INTRODUCTION

1.1 Background

The upper limb plays an important role in everyone's daily life and the hand is the effectors organ of the upper limb (Puranik, 2009). One of the most significantly occurring conditions of the upper limb is tennis elbow (Jones, 2009). A painful elbow syndrome consists of lateral, medial and posterior elbow symptoms; among them the lateral elbow pain is one of the significantly noticed symptoms which results from repetitive stress (Ebnezar, 2003).

Lateral epicondylitis or tennis elbow is a painful condition characterized by pain at the lateral side of the elbow, which increases during gripping, squeezing, repeated twisting movement, resisted wrist extension and it usually affects the dominant arm (Bisset et al., 2005). Lateral epicondylitis was first described in 1873 by Mr. Runge (Trivedi et al., 2014). The aetiology of tennis elbow is poorly understood (Jones, 2009). It most commonly occurs due to damage to the common extensor tendon of the forearm (Trivedi et al., 2014).

Rheumatic disorders are one of the most common health problems in both developed and developing countries. The prevalence of rheumatic disorders globally is between 11% to more than 50%. 28% of these condition result in disability. In Bangladesh, a study on the prevalence of rheumatic diseases in the adult population showed that musculoskeletal complaints was 26.1%, and the incidence of tennis elbow is 2.77% (Hasan et al., 2009). Tennis elbow affects 1% to 3% of the adult population and only 5% of people suffering from tennis elbow actually play tennis (Smidt et al., 2006). The prevalence of tennis elbow in Sweden is 1% to 3%, which increases to 19% in men between 40 and 50 years of age (Labelle et al., 1992). The incidence rate increases to 10% in women with the age range between 42 to 46 years (Buchbinder et al., 2007). It is reported that 7.4% of industrial workers and 40% to 50% of tennis players in the USA are affected with tennis elbow (Labelle et al., 1992). The incidence of tennis elbow is between 4 and 7 per 1000 patients per year (Struijs et al., 2001). In western societies lateral epicondylitis is a significant economic burden resulting in a high rate of sick level (Shmushkevich et al., 2013).

Lateral epicondylitis most commonly occurs in persons between 30 and 60 years old. Both male and female are equally affected but this condition becomes more severe in women (Stasinopoulos et al., 2004).

Tennis elbow is seen in both tennis and non-tennis players. Up to 50% of tennis players experience some types of elbow pain and 75% to 80% of these elbow pains are diagnosed as tennis elbow (Bisset et al., 2005). The duration of a typical episode of lateral epicondylitis is between 6 months to and 2 years (Smidt et al., 2003). Lateral epicondylitis become chronic when symptoms persist more than three months (Khuman et al., 2013).

The conventional treatment protocol for lateral epicondylitis consists of many physical therapies in a variety of clinical settings, such as stretching, strengthening, Deep Transverse Friction Massage (DTFM) and mobilization. These treatments of tennis elbow generally aim to relieve pain, control inflammation, promote healing, improve local and general fitness, and control force loads (Noteboom et al., 1994).

The most common conservative treatments given for lateral epicondylitis are rest, ice, non-steroidal anti-inflammatory drugs, corticosteroid injections, DTFM, range of motion exercises, stretching, strengthening exercises and ultrasound (Jones, 2009).

A recent treatment called Myofascial Release Technique (MFR) is also now being used to treat patients with Lateral Epicondylitis, but there are few formal reports of its success rate (Trivedi et al., 2014).

Myofascial release is a soft tissue mobilization technique. Myofascial release is the application of a low load, long duration stretch to the myofascial complex. This technique is applied in order to restore optimal length, decrease pain, and improve function. MFR generally involves slow, sustained pressure applied to restricted fascial layers either directly or indirectly (Ajimsha et al., 2012).

When myofascial release is used in combination with conventional treatment it becomes more effective in providing immediate relief of pain and tenderness. The facial restriction of one region of the body causes stress on another region of the body and causes stress on any structures that are enveloped, divided, or supported by fascia. Pressure can be relieved on pain sensitive structures such as nerves and blood vessels to restore the length and health of restricted connective tissue (Ajimsha et al., 2014).

Myofascial pain is a common form of pain which arises from muscle and related fascia, and is associated with myofascial trigger points (Shmushkevich et al., 2013).

Myofascial release has two techniques, direct and indirect (khuman et al., 2013). During the direct technique pressure is applied directly on the restricted fascia. In this technique the therapist uses knuckles, elbow, and other tools to slowly sink into the fascia, and apply a few kilograms of force to contact the restricted fascia or to stretch the fascia. During the indirect myofascial release technique a gentle stretch is applied over the restricted fascia and a few grams of force is applied over the fascia (Ajimsha et al., 2014). Myofascial release does not restore joint motion. It is applied to alleviate muscle stiffness, reduce pain and improve the range of motion (Kuruma et al., 2013).

1.2 Rationale

Lateral epicondylitis or tennis elbow is a painful debilitating condition of the elbow, which creates a disturbance in functional activities. The Literature suggests that pain and dysfunction are very common with tennis elbow, and this can interfere with the person's ability to function at work & recreation. So it is very important to manage the cases of tennis elbow. In Bangladesh, tennis elbow represents a challenge to the clinician, because considering the context of our country; patients often struggle to follow the evidenced-based treatment recommended.

The purpose of this study is to find out the effectiveness of myofascial release for the patient with tennis elbow. There has been some research articles published about physiotherapy interventions for patients with tennis elbow. But very few research articles published regarding myofascial release. However, research helps to improve the knowledge of health professionals, as well as to develop the profession. The results of this study may help to guide physiotherapists to give evidence-based treatments to patients with tennis elbow, which will be beneficial for both the patient with tennis elbow, and for developing the field of physiotherapy.

1.3 Aims

The aim of this study is to evaluate effectiveness of myofascial release in patients with lateral epicondylitis.

1.4 Objectives

- To find out the pain intensity at rest before and after introducing myofascial release.
- To evaluate the pain intensity during a strong grip before and after introducing myofascial release.
- To determine the pain intensity at forceful wrist extension before and after introducing myofascial release.
- To evaluate the pain intensity during doing a task with repeated arm movement
- To evaluate the pain intensity during a cozen test before and after introducing myofascial release.
- To compare the pain intensity during the resisted middle finger test before and after introducing myofascial release.
- To find out the pain intensity during turn a doorknob or key or open a jar before and after introducing myofascial release.
- To evaluate the pain intensity during palpation of the affected side before and after introducing myofascial release.

1.5 Hypothesis

Myofascial release is more effective for the treatment of the patients with tennis elbow.

1.6 Null hypothesis

Myofascial release is no more effective for the treatment of the patients with tennis elbow than conventional physiotherapy treatments.

1.7 List of variables

Independent variables

Myofascial release

Dependent variable

Tennis elbow and conventional physiotherapy.

1.8 Operational definition

Tennis elbow: Tennis elbow or lateral epicondylitis is a clinical condition characterized by pain and tenderness over the lateral side of the elbow, difficulties in functional activities and with positive Mill's test, Cozen test or resisted middle-finger extension test when examined clinically.

Conventional physiotherapy: Physiotherapeutic interventions that are widely accepted and commonly practiced by the medical community.

Myofascial release: Myofascial release is the application of a low load, long duration stretch to the myofascial complex, intended to restore optimal length, decrease pain and improve function.

CHAPTER-II LITERATURE REVIEW

The most common lesion of the elbow is lateral epicondylitis (Trivedi et al., 2014). Tennis elbow is a painful debilitating musculoskeletal condition and this is a challenge for the health care industry (Bisset et al., 2005). Tennis elbow is defined as pain in the common extensor group of wrist muscles at their origin of lateral epicondyle, or pain directly over the lateral epicondyle (Trivedi et al., 2014). Elbow pain and dysfunction decreases the working capacity, and quality of life (Lee et al., 2014).

There are many synonyms of tennis elbow, such as lateral elbow pain, lateral epicondylitis, rowing elbow, tendonitis of the common extensor origin, and peritendonitis of the elbow (Vicenzino et al., 1995). It is a pathological condition that is described as an inflammation at the origin of the Extensor Carpi Radialis Braves (ECRB), and an inflammation of the extensor communes aponeurosis at the lateral epicondyle of the elbow, characterized by repetitive micro tear and fibrosis (Baker et al., 2009). It is reported that 64% of patients with tennis elbow involves Extensor Carpi Radials Braves muscle and approximately 35% of patients involves Extensor Digitorum Communes muscle (Raman et al., 2012).

The pathology of lateral epicondylitis involves a tear of tendon at origin of the extensor muscles from lateral epicondyle (Trividi et al., 2014). Macroscopic and microscopic tears may be superficial or deep and situated at the tendinous origin of the Extensor Carpi Radialis Bravis into the periosteum of the lateral humeral epicondyle (Faisal et al., 2013). The tear occurs at the junction between muscle and bone leading to slow healing due to lack of overlying periosteal tissue. Repetitive micro trauma from overuse may overload the repairing tissue, mechanically twist scar tissue and thus excite free nerve ending to inducing mechanical nociceptive pain (Khuman et al., 2013). In this position the tendon is further stretched over the prominence of the radial head (Trividi et al., 2014).

According to Cyriax (1936), the classifications of tennis elbow are as follows - acute, meaning acute pain following indirect trauma. The second type is sub-acute, pain following indirect trauma which occurs gradually and follows vigorous exercise with the arm. The third one is chronic occupational pain. This types usually develops over one or more months and is usually found in older patients. The fourth one is pain

following direct trauma, which is due to direct injury over the lateral epicondyle. According to the site of involvement there are four types of tennis elbow. These are –

Type 1: inflammation at the supracondylar ridge

Type 2: tenoperiosteal junction

Type 3: body of the tendon

Type 4: muscle belly (Kesson et al., 1998).

The exact cause of tennis elbow is unknown, but it is generally thought to be repetitive micro trauma due to over use of wrist and hand (Bui, 2014). Micro trauma which is arising from the sports activity, the industrial works and house hold activities (Croisier et al., 2007). Myofascial trigger points in the muscles attached to the lateral epicondyle may also be a source of pain (Bui, 2014). It is usually caused by very quick, monotonous, repetitive, eccentric contractions and gripping activities of the wrist (Stasinopoulus et al., 2005). The main cause of tennis elbow is thought to be the degeneration of the common extensors tendon of the wrist (silvestrini et al., 2005). Tennis elbow may occur due to tearing the tendon at the musculotendineous junction, and the healing process becomes delayed due to the lack of the overlying periosteal tissue (Khuman et al., 2013). The possible aetiologies are inflammation of the radial humeral bursa, synovium, periosteum and annular ligament (Puranik, 2009).

The most common symptoms of tennis elbow are pain, decrease muscle strength and dysfunction in the arm. The pain and dysfunction decrease the work capacity and quality of life (Lee et al., 2014). Khuman et al. (2013) stated that, the symptoms of tennis elbow encompass pain at lateral epicondyle of humerus during resisted wrist extension and patients complains functional difficulty affecting activities of daily living related to wrist and forearm movements. Noteboom et al. (1994) proposed that, the anterior aspect of the lateral epicondyle and the lateral forearm exhibits significant tenderness. Many individuals may experience pain at the head of the radius during pronation due to irritation of the underlying bursa (Trivedi et al., 2014). The grip strength is affected due to wasting of the affected muscles and due to voluntary decline of effort to avoid pain (Khuman et al., 2013). Myofascial pain is the common form of pain arising from muscles and related fascia and are usually associated with myofascial trigger point and sometimes pain referred to the forearm muscle (Shumshkevich & Kalichman, 2013).

The goal for the treatment of lateral epicondylitis are – reduction of pain, relief of inflammation, promotion of healing, reducing the overload forces, improve function, preservation of motion, increase flexibility, strength and development of endurance (Lee et al., 2014). Physiotherapy treatment initially consists of assessment, modification of activity, and application of ice and selects modalities (Faisal et al., 2013). The treatment methods, we commonly used for tennis elbow are- rest, ice, brace, nonsteroidal anti-inflammatory drugs, ultrasound, laser, TENS, deep transverse friction massage, stretching, strengthening, eccentric exercise, extracorporeal shockwave therapy, elbow mobilization with movement technique, tapping, manipulation etc. (Amro et al., 2010). Dunkow et al. (2004) have suggested the initial treatment with rest, modification of activity, local splints, and steroid injection is effective enough for tennis elbow. According to Zeisig (2008) as the symptoms become aggravated with activity, rest is useful for pain relief.

Therapeutic ultrasound (US) is most frequently used tool in the last decades as it has been applied to common musculoskeletal conditions such as LET by physiotherapists (Dimitrios et al., 2013). Half of physiotherapists use pulsed and continuous ultrasound for treating tennis elbow (Jones, 2009). Faisal et al. (2013) states that, application of continuous or pulsed mode upon tissue increases blood flow and reduce muscle spasm, increases extensibility of collagen fibres and decreases inflammatory response. The overall efficacy of this treatment for musculoskeletal disorders is in debate. In systematic review Jones (2009) found that, when pulsed ultrasound is compared with other treatments, such as injections and TENS, there were no significant differences in outcomes between groups, with weak evidence for its effectiveness. Its effectiveness has been evaluated in four previously published systematic reviews and the conclusion of these four systematic reviews was that there was a lack of scientific evidence supporting physiotherapy treatments such as ultrasound for LET. To our knowledge, there has been no review to establish only the effectiveness of ultrasound for LET (Dimitrios et al., 2013).

According to Zeisig (2008) application of shock wave therapy with single pulsed acoustic wave is helpful to reduce pain and to progress healing process (Dimitrios et al., 2013). Jones (2009) found that, about 10% of physiotherapists use pulsed shortwave diathermy in the treatment of tennis elbow. There is weak evidence for the effectiveness of pulsed shortwave diathermy. Low level laser therapy is very

beneficial for enhancing healing process it is not so significantly used by physiotherapists for managing tennis elbow. At present, there is no evidence for long term effect of laser when compared with placebo treatment (Jones, 2009). Zeisig (2008) states that, TENS (Transcutaneous Electrical Nerve Stimulation) acts to activate pain relieving systems in tennis elbow.

Only one study was identified the effect of ice therapy on tennis elbow (Jones, 2009). Manias & Stasinopoulos (2006) compared an exercise group and ice group with an exercise group alone, where the ice was being applied for 10 minutes after each exercise session. At 4 months follow-up no significant differences were seen between the two groups, which indicating that ice may be ineffective as a treatment in the management of tennis elbow.

In about 21% of cases orthotic device are described for the treatment of tennis elbow (Jones, 2009). Struijs et al. (2004) stated that, different types of braces and orthotic devices are available. All of them tennis elbow strap or band is the most commonly used brace. Different studies showed that, forearm bracing has an undeviating effect to reducing stress on the origin of Extensor Carpi Radialis Bravis (ECRB) muscle (Jones, 2009). Bui (2014) demonstrated that, forearm brace is an effective treatment in reducing pain for the patient with tennis elbow.

Zeisig (2008) included that, stretching exercise is one of the standard physiotherapy treatment for tennis elbow. Static stretching exercise helps to reduce pain, increase grip strength and helps in recovery to normal range of motion (Lee et al., 2014). An overview of systematic review Jone (2009) found that, in a small study progressive stretching exercise was compared with ultrasound and both groups were improve after 6-8 weeks of treatment; while progressive stretching exercise was more effective than ultrasound (Jones, 2009). Static stretching exercise was recently compared with Cyriax physiotherapy and the treatment intervention was 3 times per week for 4 weeks. After 4 weeks intervention both groups experienced significant improvements in pain and function but static stretching was more effective than Cyriax physiotherapy (Viswas et al., 2011).

Strengthening exercise programmes are the suitable treatment method for evaluating the treatment outcome in patient with tennis elbow (Pienimaki et al., 1996). There are three forms of strengthening exercise for soft tissue structure such as isometric,

concentric and eccentric exercise (Stasinopoulos et al., 2005). Park et al. (2009) assured that, isometric strengthening exercise is effective treatment during the initial period.

Eccentric exercise has most beneficial effect for the treatment of tennis elbow. Therapist advocates eccentric exercise only for the injured tendon (Stasinopoulos et al., 2005). There is some evidence to support the use of eccentric training programmes in tennis elbow (Jones, 2009). Svenlov & Adolfson (2001) did a small randomized controlled trial of 3 months of eccentric exercise compared with daily stretches; found that the eccentric training programme produced significant improvements in grip strength, with complete resolution of symptoms. A recent study comparing isokinetic eccentric work with a standard rehabilitation programme, demonstrated a reduction in pain and Improve grip strength in individuals, following the eccentric programme (Croisier et al., 2007). Wen et al. (2011) did a randomized controlled study of eccentric exercise programme compared with iontophoresis, ultrasound and stretching, in this study he found that eccentric exercise is more effective treatment for tennis elbow. A systematic review by Cullinane et al. (2014) found that patient with lateral epicondylitis who undergo an eccentric exercise programme compared with other therapies, decreased pain and improved function and grip strength in comparison to their baseline measures. Seven out of nine studies that involved eccentric exercise programme showed improved outcomes for pain, function and grip strength in comparison to other combined treatment programmes. Strengthening exercise is very important to strengthen the affected tendon and improving the functional activities (Lee et al., 2014). A systematic review by Raman et al. (2012) found moderate research evidence to support isotonic eccentric exercise programme for improving pain, strength and function over time.

Thomas (2010) stated that, deep transverse friction massage (DTFM) is a soft tissue mobilization technique that acts by releasing and stretching the impaired tissue causing dysfunction. Very few studies are done to look at the effectiveness of DTFM (Jones, 2009). Thomas (2010) did a study on deep transverse friction massage for treating tendinitis and found that DTFM is effective for promoting rehabilitation. Viswas et al. (2012) did a small randomized controlled trial of 4 weeks of supervised therapeutic exercise programme compared with Cyriax physiotherapy including

DTFM and found that, supervised exercise programme is more effective than DTFM to reduce pain and improve function.

Manipulation is effective in cases where active use of extensor muscles produces. Mills manipulation acts by rupturing the adhesions to elongate the scar tissue (Alam, 2008). Stasinopoulos & Johnson (2004) did a literature review that purposes to describe Cyriax approach, its effectiveness and use in the treatment of tennis elbow and claimed that deep transverse friction in combination with mills manipulation is successful enough for treating tennis elbow.

Mobilization with movement is a manual therapy intervention which is most commonly used in the management of patient with tennis elbow (Slater et al., 2006). It is a system of manual therapy interventions developed by Brian Mulligan which combine a sustained manual 'gliding' force to a joint with concurrent physiologic motion of the joint, either actively or passively (Abbott et al., 2001). This technique is use for the management of movement related pain and stiffness (Slater et al., 2006). MWM treatment technique may be applied in treating those patients who experience pain when elevating the arm, for example, swinging a tennis racket , reaching for shelves and working overhead (Vicenzino, 2003). Kochar & Dogra (2002) did a small study compared a 3 weeks trial of ultrasound and MWM, compared with ultrasound alone. Both groups then underwent a 10 weeks programme of progressive upper limb rehabilitation, including the use of weights &Findings of this study were a significant improvement in the MWM group in terms of pain and the weight test, but no difference in grip strength. The MWM group also had a faster recovery time compared with the ultrasound group.

Many therapists use tapping for the treatment of tennis elbow, in order to relieve pain and allow functional restoration of movement patterns (Jones, 2009). A small study demonstrated that tapping may be useful as an adjunct to exercise (Vicenzino et al., 2003). Shamsoddini et al. (2010) describes the neurophysiologic effects of taping, that the tape produces an effect on grip strength by altering pain perception, facilitating large afferent fibres and by stimulating endogenous processes of pain inhibition. Sharath (2005) found that, taping is useful for many reasons, such as to prevent injury, to limit extremes of ROM, to apply compression aims to decrease pain, swelling and spasm, to immobilize or resist the involved area so that healing can promote. Alam (2008) suggested that, tape is applied across the joint in several layers and is

positioned to provide outside support and restrict forces that would apply stress on an injured part. Shamsoddini et al. (2010) did a study of tapping compared with other treatment, this study demonstrated that the application of taping technique (diamond tape) reduce pain and improved grip strength immediately after application in participants with lateral epicondylalgia.

Myofascial release is a soft tissue mobilization technique. Myofascial release is the application of a low load, long duration stretch to the myofascial complex, this technique is applied to restore optimal length, decrease pain, and improve function. MFR generally involves slow, sustained pressure applied to restricted facial layers either directly or indirectly (Ajimsha et al., 2012). Myofascial Release Technique (MFR) is being used to treat patients with Lateral Epicondylitis, but there are few formal reports of its success rate (Trivedi et al., 2014).

When myofascial release is used in combined with conventional treatment it becomes more effective to provide immediate relief of pain and tenderness. The facial restriction of one region of the body causes stress on another region of the body and causes stress on any structures that are enveloped, divided, or supported by fascia. Pressure can be relieved on pain sensitive structures such as nerves and blood vessels to restore the length and health of restricted connective tissue (Ajimsha et al., 2014). Myofascial pain is a common form of pain which is arising from muscle and related fascia and associated with myofascial trigger point (Shmushkevich et al., 2013). MFR is being used to treat patients with a wide variety of conditions, but there is little research to support its efficacy (Ajimsha et al., 2014). MFR is a useful technique in physical therapy for alleviating muscle stiffness, reducing pain, and improving range of motion (Kuruma et al., 2013).

Myofascial release has two techniques, these are- direct technique an indirect technique (khuman et al., 2013). During direct technique pressure is applied directly on the restricted fascia. In this technique therapist use knuckles, elbow and other tools to slowly sink into the fascia and apply few kilogram of force to contact the restricted fascia or to stretches the fascia. During indirect myofascial release technique a gentle stretch is applied over the restricted fascia and few grams of force is applied over the fascia (Ajimsha et al., 2014). Myofascial release does not applied to restore joint

motion; it is applied to alleviating muscle stiffness, reducing pain, and improving range of motion (Kuruma et al., 2013).

There is very few evidence to compare the effects of myofascial release technique in lateral epicondylitis (Khuman et al., 2013). Ajimsha et al. (2012) did a study on lateral epicondylitis and the objectives of the study was to evaluate the effectiveness of myofascial release compare with other physiotherapy treatment for the management of tennis elbow in computer professionals and the findings of this study was MFR technique is more effective. Another study by Khuman et al. in (2013) reported that, myofascial release technique is more effective treatment in case of chronic lateral epicondylitis. Trivedi et al. (2014) compared conventional physiotherapy with active releasing technique, conventional physiotherapy with MFR and conventional physiotherapy alone group. This study found that Myofascial releases with conventional physiotherapy are more affective to reduce pain, improve gripe strength and improve function.

The present studies was designed to whether myofascial release with conventional physiotherapy is effective for reducing pain, functional activities and improve gripe strength in tennis elbow. I think that, myofascial release with conventional physiotherapy would reduce pain, improve functional activities and grip strength in tennis elbow patient.

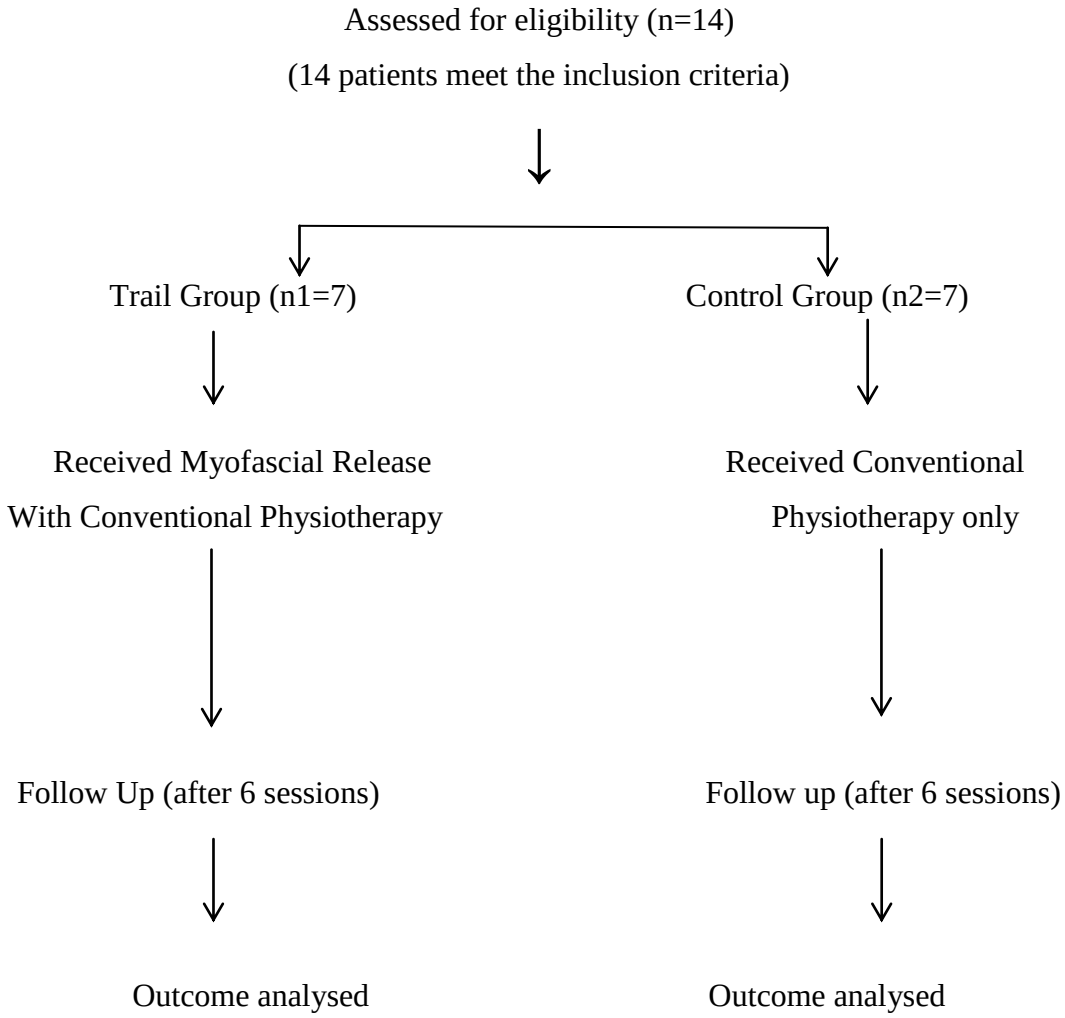
CHAPTER-III METHODOLOGY

This research was a quantitative evaluation of the comparison between the exercises programs of conventional physiotherapy, with conventional physiotherapy combined with myofascial release, for the pain management of patients with tennis elbow. To identify the effectiveness of this treatment, the numeric pain rating scalewas used as a measurement tool for measuring the pain intensity in several functional positions.

3.1 Study Design

The study was a prospective, experimental, randomized control trial design with two different subject groups. Samples are selected by randomly. It included 14 patients with tennis elbow patients who attended to the centre for the rehabilitation of paralyzed (CRP) a specialized hospital situated in the Savar, Dhaka, Bangladesh. Both groups received a common treatment regimen except one intervention. Only the experimental group received myofascial release technique while in control group only conventional physiotherapy treatment program was given. A pre-test (before intervention) and post-test (after intervention) was administered with each subject of both groups to compare the pain effects before and after the treatment.

Flowchart of the phases of randomized controlled trial



CONSORT flowchart for a randomized controlled trial of a treatment program including conventional physiotherapy with end range mobilization for patient with adhesive capsulitis.

3.2 Study area

Physiotherapy musculoskeletal outdoor department of Centre for Rehabilitation of the Paralyzed (Savar).

3.3 Study Population

A population refers to the entire group of people or items that meet the criteria set by the researcher. The populations of this study were the tennis elbow patients.

3.4 Sample selection

Subjects, who met the inclusion criteria, were taken as sample in this study. Fourteen patients with tennis elbow were selected from outdoor musculoskeletal physiotherapy department of CRP (Savar) and then 7 patients with tennis elbow were randomly assigned to myofascial release technique with conventional physiotherapy group and 7 patients to the only conventional physiotherapy group for this randomize control trial study. The study was a single blinded study. When the samples were collected, the researcher randomly assigned the participants into experimental and control group, because it improves internal validity of experimental research. The samples were given numerical number C1, C2, C3 etc. for the control and T1, T2, T3 etc. for experimental group. The samples were given numerical number such as 1, 2, 3, 4 etc. Total 14 samples included in this study, among them 7 patients were selected for the experimental group (received myofascial release with conventional physiotherapy) and rest 7 patients were selected for control group (conventional physiotherapy only).

3.5 Inclusion criteria

- Age group: 20-60 years old
- Both male & female patients are include
- Subject who had no history of taking physiotherapy intervention, oral NSAID or corticosteroid injection previously.
- Pain with gripping activities.
- Pain with resisted wrist extension.
- Pain with passive wrist flexion with the elbow extension.
- Tenderness on palpation over the lateral epicondyle of humerus.
- The participants who had no any deformity of the affected elbow and wrist.
- Voluntary participants

3.6 Exclusion criteria

- Patients with clinical disorder which may became worsen with myofascial release, such as skin disease, dermatitis, eczema.
- Subjects who had any deformity in the affected sided elbow and wrist.
- Previous trauma, surgery & acute infection to the elbow region.
- Neurological impairments.
- Cervical radiculopathy & any other upper limb dysfunction.
- Osteoporosis.

3.7 Pilot study

Pilot study is a preliminary run of the main study to highlight any problems which can then be corrected and it is important always to run some pilot study before beginning the experiment. So, the researcher performed a pilot study before beginning the main study and the aim of this pilot study was to define the list of conventional physiotherapy treatment is provided by musculoskeletal department of CRP for managing the case of tennis elbow. Researcher took one week for pilot study and visited the CRP musculoskeletal department of physiotherapy and consulted with relevant qualified physiotherapist to identify the conventional physiotherapy used for tennis elbow. The researcher formulated a list of evidence based physiotherapy interventions of tennis elbow and provided those to the physiotherapist to mark the interventions commonly used as conventional physiotherapy for tennis elbow. After finishing the pilot study, researcher became able to find out the conventional physiotherapy interventions used for tennis elbow and their frequency of use, with the consent of eight clinical physiotherapists. Cryotherapy, stretching & strengthening exercise of wrist extensor group muscle, deep transverse friction massage, ultrasound were the most commonly used interventions, the frequency of use was 100%, eccentric exercise, manipulation, oral NSAID were the second most commonly used interventions and the frequency was 75-99%, movement with mobilization, corticosteroid injection were the partially used interventions and the frequency of use was 25-49%.

3.8 Method of data collection

3.8.1 Data collection tools

A written questionnaire, pen, paper, consent form was used as data collection tools in this study.

3.8.2 Data collection procedure

Data collection procedure was conducted through assessing the patient, initial recording, treatment and final recording. After screening the patient at outdoor department, the patients were assessed by qualified physiotherapist in emergency musculoskeletal department of CRP. Those patients were fulfil all the inclusion and exclusion criteria, were chosen for this study. 14 subjects were chosen and randomly allocated in to two groups where one group received only conventional treatment called control group and another group received myofascial release technique along with conventional treatment called trial group. Data was gathered through a pre-test, intervention and post-test and the data was collected by using written questionnaire paper. Pre-test was performed before beginning the treatment and functional outcome was noted. The same procedure was performed to take post-test at the end of six session of treatment. The researcher was collected the data both in experimental and control group in front of the qualified physiotherapist in order to reduce the biasness. At the end of the study, specific test was performed for statistical analysis.

3.8.3 Measurement tools

Numeric pain rating scale- In this study researcher used visual analogue scale for measuring the intensity of pain. Numeric Pain Rating Scale is commonly use for the measurement of pain (Polly et al., 2003). The Numeric Pain Rating Scale is an 11 point Scale for patient self-reporting of pain. NPRS consists of a straight line on which the individual being assessed marks the level of pain.

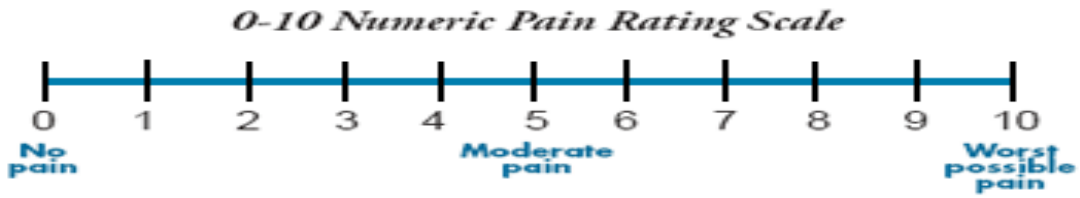


Fig-1: Numeric Pain Rating Scale

Rating	Pain Level
0	No pain
1-3	Mild pain
4-6	Moderate pain
7 – 10	Severe pain

Table-1: Numeric Pain Rating Scale

3.8.4 Intervention

A common intervention program was executed for both groups as conventional physiotherapy, it includes- Cryotherapy, stretching & strengthening exercise of wrist extensor group muscle, deep transverse friction massage and ultrasound, which are the most frequently, used interventions. In this study, the experimental group was treated with myofascial release in addition with conventional physiotherapy. Researcher applied the myofascial release technique and the conventional physiotherapies were given by clinical physiotherapist. Before applying the myofascial release technique, researcher herself has developed competency in application of myofascial release for tennis elbow. After that researcher applied the myofascial release under a strict protocol. Each group got 6 sessions of treatment. There is no evidence of exact repetition for myofascial release, but in practice expert opinion suggests that 6 session of treatment is minimal enough for patients with tennis elbow to complete the healing process.

Steps

The patients should be in supine lying with the affected side shoulder internally rotated, elbow flexed to around 15 degree and pronated. Therapist should be stand on the side of the table at the level of the client's shoulder and facing the ipsilateral hand.

Light contact of the fascia and slowly stretch the fascia from distal to proximal. Maintain a light pressure to stretch the fascia. This technique should be applied for approximately 3-5 mins to the restricted fascia.

This technique is performing on the affected extremity for 30 minutes, with a minimum 1 day gap between 2 sessions (Khuman et al., 2013).

Fig-2: Techniques of myofascial release

3.9 Data analysis

In order to ensure that the research have some values, the meaning of collected data has to be presented in ways that other research workers can understand. In other words the researcher has to make sense of the results. As the result came from an experiment in this research, data analysis was done with statistical analysis.

All participants were code according to group to maintain participant's confidentiality. All subjects of both experimental and control group score their pain intensity on numeric pain rating scale before starting treatment and after completing treatment. Reduction of pain intensity for both groups is the difference between pre-test and post-test score.

For the significance of the study, a statistical test was carried out. Statistical analysis refers to the well-defined organization and interpretations of the data by systemic and mathematical procure and rules. The U test was done for the analysis of the pain after six session treatment of both control and tail groups.

Experimental studies with the different subject design where two groups are used and each tested in two different conditions and the data is ordinal should be analysed with Mann-Whitney U test.

Mann-Whitney U test is a non-parametric test that is simply compares the result obtained from the each group to see if they differ significantly. This test can only be used with ordinal or interval/ ratio data.

The formula of Mann-Whitney U test:

$$U = n_1 n_2 + \frac{n_x(n+1)}{2} - T_x$$

Here,

n_1 = the number of the subjects in trail group

n_2= the number of the subject in control group.

T_x= the larger rank total.

n_x= the number of the subjects of the group with larger rank total.

3.10 Significant level

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

3.11 Elimination of confounding variables

Confounding variable has an effect on the study variables which can affect the result of the study. There were some confounding variables in this study such as patient's age, history of taking recent physiotherapy intervention, oral NSAID, steroid injection or other treatment which could influence the result of the study. Researcher found no significant difference between the mean age of two groups and the mean age of control group was 38 year and mean age of trial group was 36 year, so there was no effect of age which can influence the result. To control the confounding variables, researcher set the inclusion criteria as to include only those subjects who have no

history of taking recent physiotherapy intervention, oral NSAID, steroid injection or other treatment.

3.12 Limitations of the study

- The study was conducted with 14 patients of tennis elbow, which was a very small number of samples in both groups and was not sufficient enough for the study to generalize the wider population of this condition.
- It is limited by the fact daily activities of the subject were not monitored which could have influenced. Researcher only explored the effect of myofascial release after 6 sessions, so the long term effect of myofascial release was not explored in this study.
- Data was collected only from CRP for a short period of time which will affect the result of the study to generalize for wider population.
- There was no available research done in this area in Bangladesh. So, relevant information about tennis elbow patient with specific intervention for Bangladesh was very limited in this study.

3.13 Ethical consideration

Research proposal was submitted for approval to the administrative bodies of ethical committee of CRP. Again before beginning the data collection, researcher was obtained the permission from the concerned authorities ensuring the safety of the participants. In order to eliminate ethical claims, the participants were set free to receive treatment for other purposes as usual. Each participant was informed about the study before beginning and given written consent.

3.14 Informed Consent

The researcher obtained consent to participate from every subject. A signed informed consent form was received from each participant. The participants were 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 worsen. The participants were 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. Every subject had the opportunity to discuss their problem with the senior authority or administration of CRP and have any questioned answer to their satisfaction.

CHAPTER-IV RESULTS

Fourteen patients with tennis elbow were taken for this study. Seven patients with myofascial release technique with conventional physiotherapy treatment group (trial group) and another seven with conventional physiotherapy treatment group (control group). The all subjects of both experimental and control group scored their pain on Numeric pain ratting scale before and after completing treatment.

Mean age of the participants

The study was conducted on 14 participants of tennis elbow patients. Out of the participant the mean age of the participants was 36 years at trial group and 38 years at control group. The minimum age range is 25 years and maximum 50 years (Table-1).

Trial group		Control group	
Subjects	Age (years)	Subjects	Age (years)
T1	42	C1	43
T2	30	C2	46
T3	40	C3	25
T4	42	C4	32
T5	30	C5	39
T6	32	C6	50
T7	36	C7	43
Mean Age	**36**	**Mean Age**	**38**

Table- 2: Mean age of the participants of trial and control group.

Sex of the participants

Among 14 patients with tennis elbow 35.7 % (n=5) were male and about 65.3% (n=9) were female.

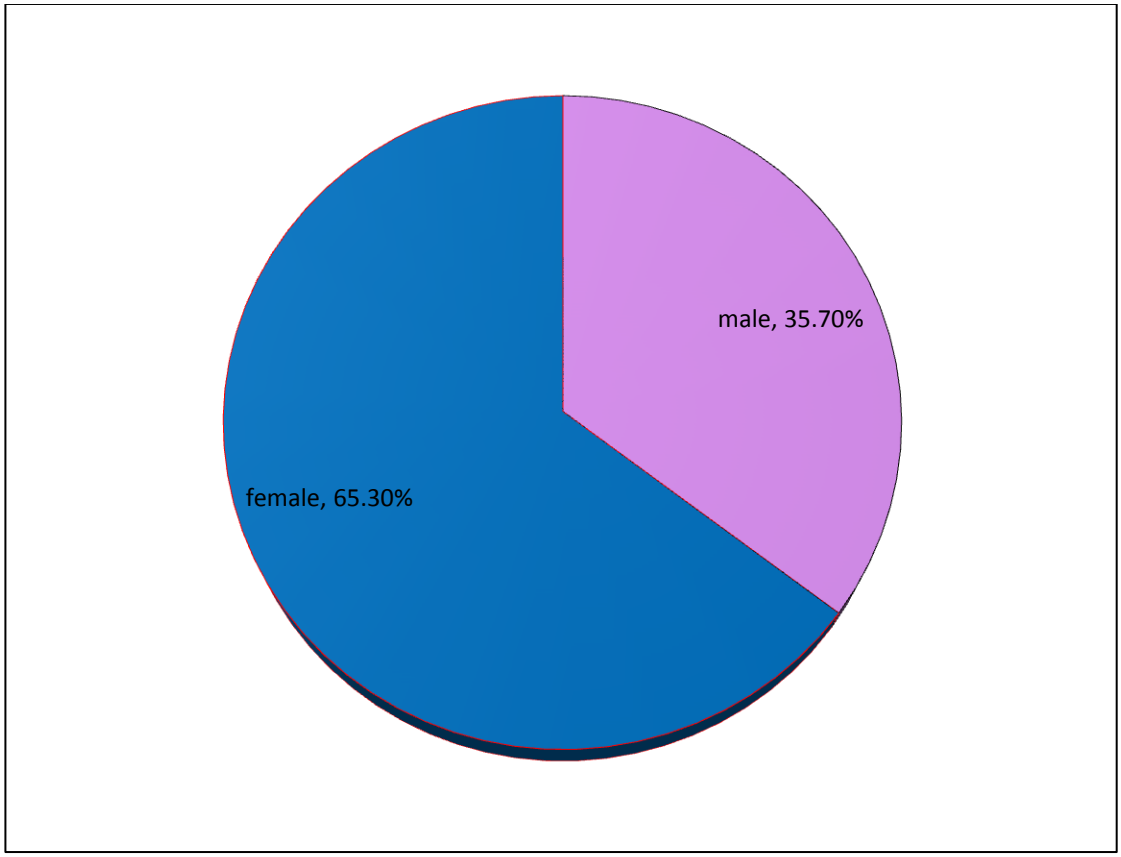


Figure-3: Gender Distribution

Occupational status

Among 14 patients with tennis elbow 35.7 %were service holder, 50% patient were house wife, 7.1 % patients were farmer and 7.1 % patients were businessman.

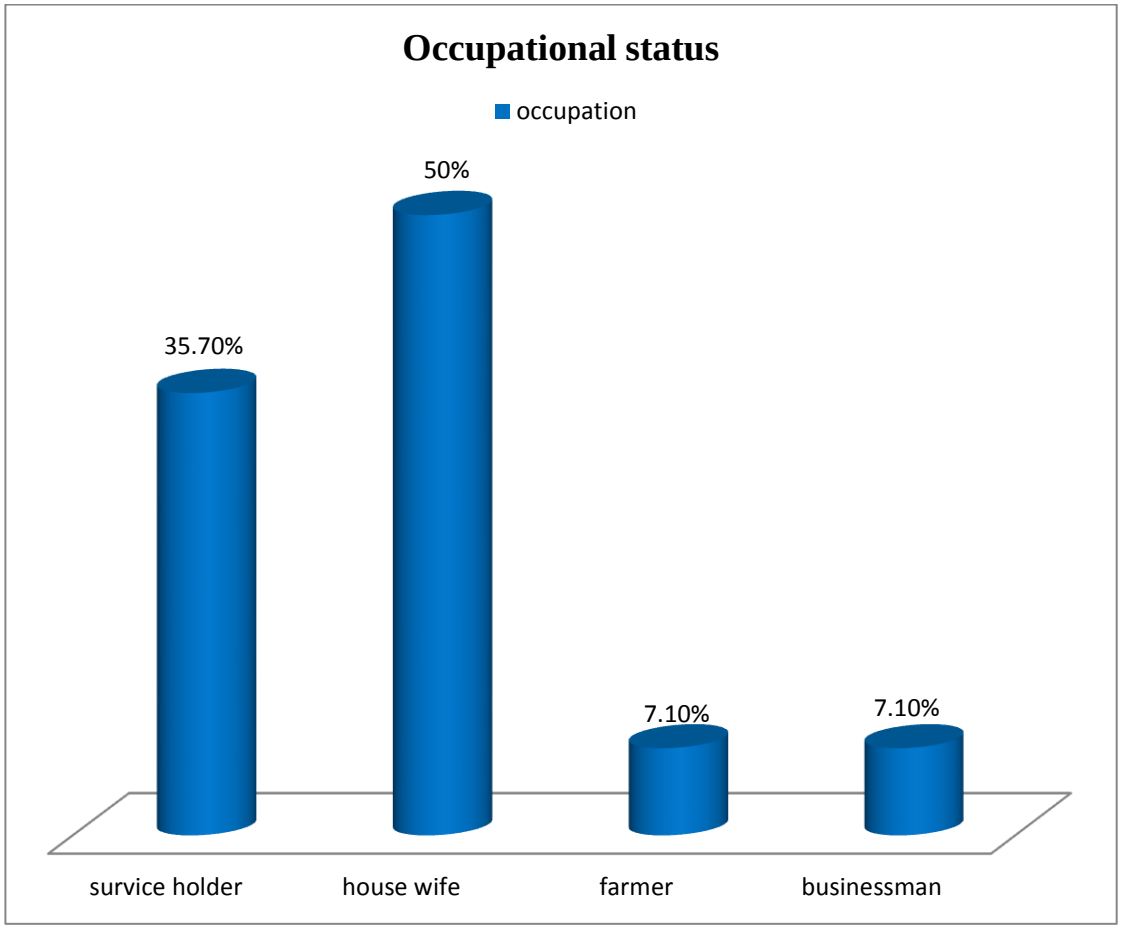


Figure-4: Occupational status

Involve hand

The study was conducted on 14 participants of tennis elbow patients. Among them 71.4% has dominant hand involvement and 28.6 % has non-dominant hand involvement.

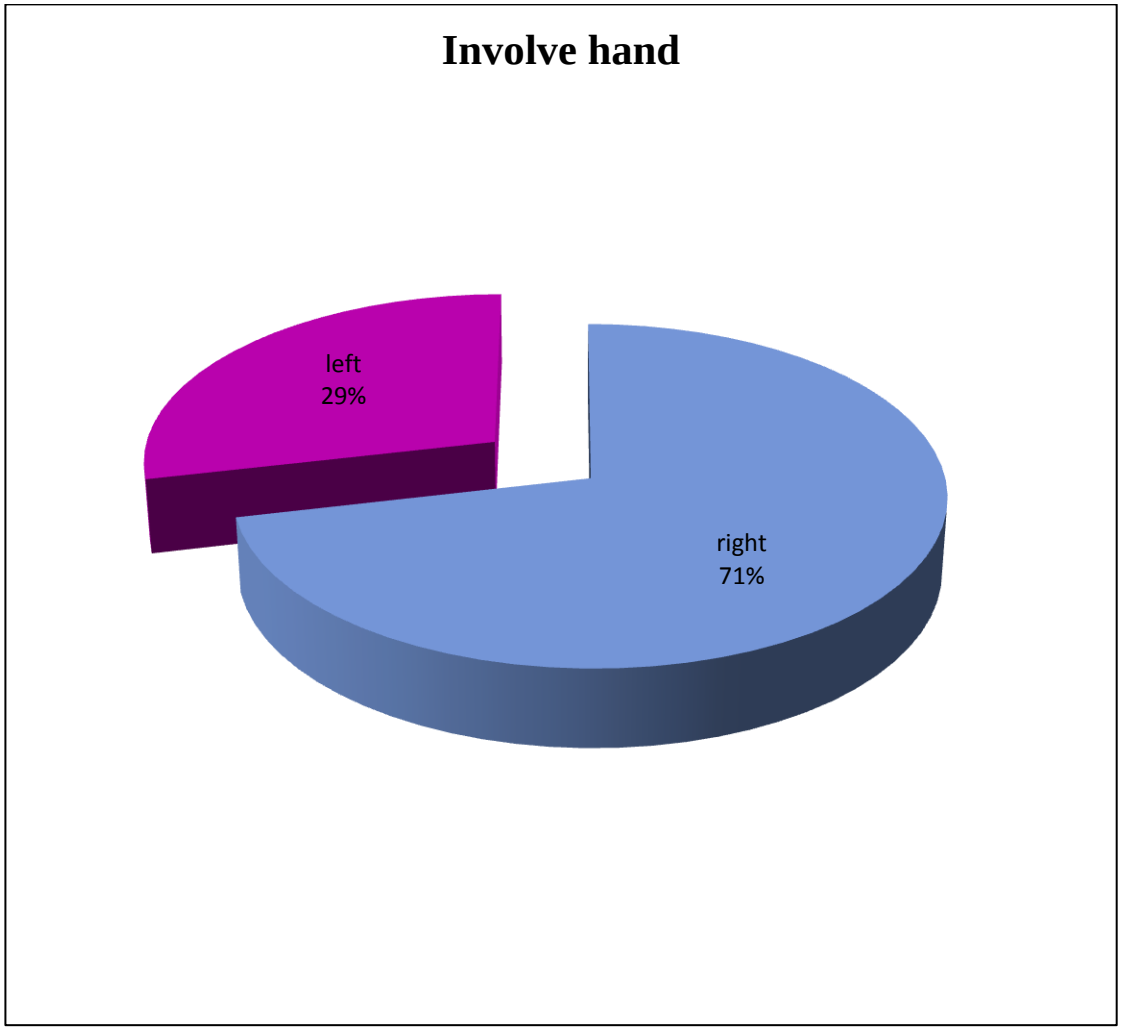


Fig-5: Hand involvement

14 patients with tennis elbow were enrolled in the study. 7 in the myofascial release with conventional physiotherapy treatment group (experimental group) and 7 in the only conventional physiotherapy treatment group (control group). The all subjects of both experimental and control group scored their pain on numeric pain rating scale before and after completing treatment.

Name of the variables	**Experimental group**	**Control group**
Resting pain	5.1	4.1
Pain on forceful wrist extension	5.2	3.2
Pain on forceful grip	5	3.1
Pain on repeated arm movement	5	2.7
Pain on cozen test	5.1	3.2
Pain on forceful middle finger extension	5.2	3.5
pain during Turn a doorknob or key or open a jar	5.4	3.2
Pain on palpation	5.2	3

Table-3: Mean difference of reduction of pain intensity between pre-test and post-test in experimental and control group

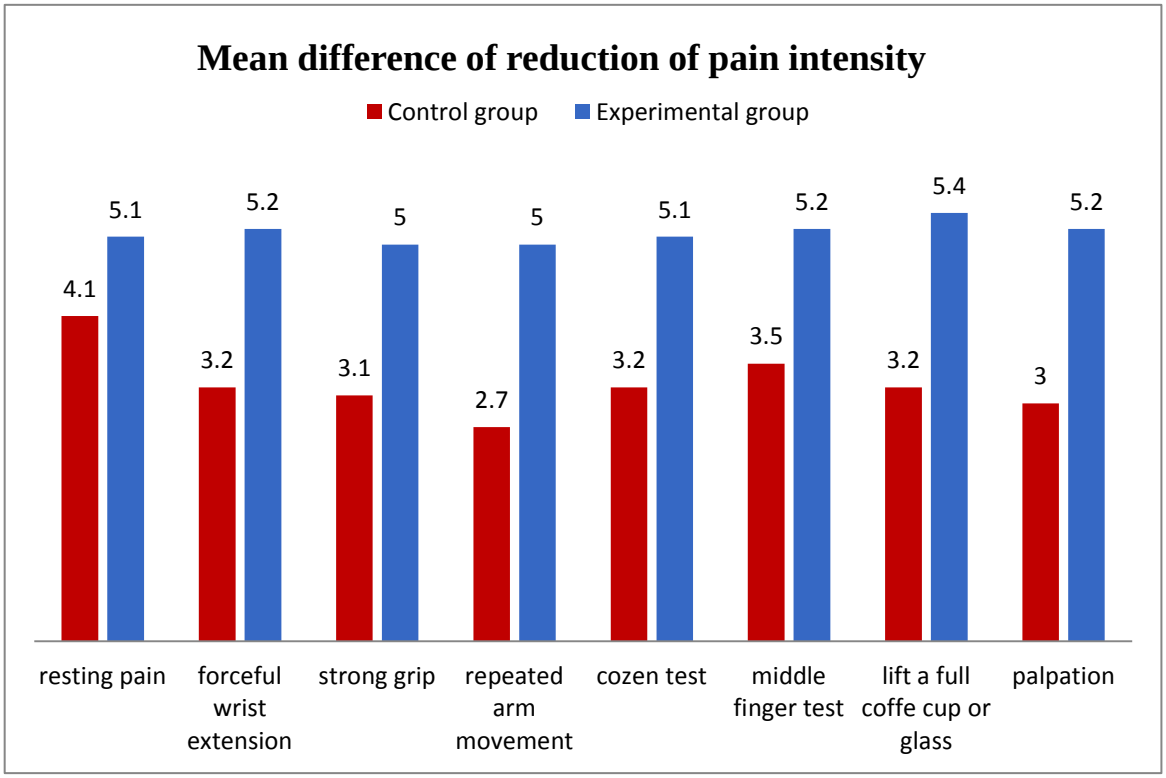


Figure-6: Mean difference of reduction of pain intensity between pre-test and post-test in experimental and control group

In this figure the researcher found significant improvement of pain. This figure shows that there is significant improvement of pain during rest, forceful wrist extension, forceful grip, repeated arm movement, cozen test, middle finer test, during turning a doorknob or open a jar, on palpation, as the mean difference are consecutively 2, 2, 1.9, 2.3, 1.9, 1.7, 2.2 and 2.2 times more than control group.

Resting pain: Reduction of pain scores after six session of intervention of experimental and control group for resting pain in tennis elbow were shown in table-3.

Experimental group			Control group		
Subjects	Post test score	Rank	Subjects	Post test score	Rank
T_1	2	5	C_1	3	10
T_2	2	5	C_2	4	12.5
T_3	2	5	C_3	5	14
T_4	1	1	C_4	3	10
T_5	3	10	C_5	4	12.5
T_6	2	5	C_6	2	5
T_7	2	5	C_7	2	5
total	14	36		23	69

Table-4: Reduction of resting pain in experimental and control group with rank

Here,

n_1= the number of the subjects in control group = 7

n_2 = the number of the subject in in experimental group = 7

T_x = the larger rank total = 69

n_x = the number of the subjects in the condition with larger rank total .That is control group= 7

Now U formula:

$$U = n_1 n_2 + \frac{n_x(n_x+1)}{2} - T_x$$

$= 7 \times 7 + \frac{7(7+1)}{2} - 69$

$= 49 + 28 - 69$

$= 77 - 69$

$= 8$

The U-value is 8. The critical value of U at $p \leq 0.05$ is 11. Therefore, the result is significant at $p \leq 0.05$.

Pain on forceful wrist extension: Reduction of pain scores after six session of intervention of experimental and control group for Pain on forceful wrist extension in tennis elbow were shown in table-4.

Experimental group			Control group		
Subjects	Post test score	Rank	Subjects	Post test score	Rank
T_1	1	2	C_1	4	10.5
T_2	1	2	C_2	5	12.5
T_3	2	5.5	C_3	5	12.5
T_4	3	8.5	C_4	2	5.5
T_5	3	8.5	C_5	6	14
T_6	2	5.5	C_6	2	5.5
T_7	1	2	C_7	4	10.5
Total	13	34		28	71

Table-5: Reduction of pain on forceful wrist extension in experimental and control group with rank.

Here,

n_1 = the number of the subjects in control group = 7

n_2 = the number of the subject in experimental group = 7

T_x = the larger rank total = 71

n_x = the number of the subjects in the condition with larger rank total .That is control group= 7

Now 'U' formula:

$$U = n_1 n_2 + \frac{n_x(n_x+1)}{2} - T_x$$

$= 7 \times 7 + \frac{7(7+1)}{2} - 71$

$= 49 + 28 - 71$

$= 77 - 7$

= 6

The U-value is 6. The critical value of U at p≤ 0.05 is 11. Therefore, the result is significant at p≤ 0.05.

Pain on forceful grip: Reduction of pain scores after six session of intervention of experimental and control group for Pain on forceful grip in tennis elbow were shown in table-5.

Experimental group			**Control group**		
Subjects	Post test score	Rank	Subjects	Post test score	Rank
T_1	2	4	C_1	4	10.5
T_2	3	8.5	C_2	5	12
T_3	2	4	C_3	6	13..5
T_4	3	8.5	C_4	4	10.5
T_5	2	4	C_5	6	13.5
T_6	2	4	C_6	2	4
T_7	2	4	C_7	2	4
Total	16	37		29	68

Table-6: Reduction of pain on forceful grip on experimental and control group with rank

Here,

n_1 = the number of the subjects in control group = 7

n_2 = the number of the subject in experimental group= 7

T_x = the larger rank total =

n_x = the number of the subjects in the condition with larger rank total .That is control group= 7

Now U formula:

$$U = n_1 n_2 + \frac{n_x(n_x+1)}{2} - T_x$$

$= 7 \times 7 + \frac{7(7+1)}{2} - 68$

$= 49 + 28 - 68$

$= 77 - 68$

= 9

The U-value is 9. The critical value of U at p≤ 0.05 is 11. Therefore, the result is significant at p≤ 0.05

Pain on repeated arm movement: Reduction of pain scores after six session intervention of experimental and control group for pain on repeated arm movement in tennis elbow were shown in table-6.

Experimental group			**Control group**		
Subjects	Post test score	rank	Subjects	Post test score	rank
T_1	2	4	C_1	4	10.5
T_2	2	4	C_2	5	13
T_3	2	4	C_3	5	13
T_4	3	8	C_4	4	10.5
T_5	3	8	C_5	5	13
T_6	2	4	C_6	2	4
T_7	1	1	C_7	3	8
Total	15	33		28	72

Table-7: Reduction of pain on repeated arm movement on experimental and control group with rank

Here,

n_1 = the number of the subjects in control group= 7

n_2 = the number of the subject in experimental group= 7

T_x = the larger rank total =72

n_x = the number of the subjects in the condition with larger rank total .That is control group= 7

Now 'U' formula:

$$U = n_1 n_2 + \frac{n_x(n_x+1)}{2} - T_x$$

$$= 7 \times 7 + \frac{7(7+1)}{2} - 72$$

$$= 49 + 28 - 72$$

= 77 –72

= 5

The U-value is 5. The critical value of U at p≤ 0.05 is 11. Therefore, the result is significant at p≤ 0.05

Pain on cozen test: Reduction of pain scores after six session intervention of experimental and control group for pain on cozen test in tennis elbow were shown in table-7.

Experimental group			**Control group**		
Subjects	Post test score	Rank	Subjects	Post test score	rank
T_1	2	5	C_1	3	10
T_2	2	5	C_2	6	12.5
T_3	1	1	C_3	5	11
T_4	3	10	C_4	2	5
T_5	3	10	C_5	6	12.55
T_6	2	5	C_6	2	5
T_7	2	5	C_7	2	5
Total	15	41		26	61

Table-8: Reduction of pain during cozen test on experimental and control group with rank

Here,

n_1 = the number of the subjects in control group= 7

n_2 = the number of the subject in experimental group= 7

T_x = the larger rank total =61

n_x = the number of the subjects in the condition with larger rank total. That is control group = 7

Now ‘U’ formula:

$$U = n_1 n_2 + \frac{n_x(n_x+1)}{2} - T_x$$

$$= 7 \times 7 + \frac{7(7+1)}{2} - 61$$

= 49 + 28 – 61

= 77 –61

= 16

The U-value is 16. The critical value of U at p≤ 0.05 is 11. Therefore, the result is not significant at p≤ 0.05

Pain on forceful middle finger extension: Reduction of pain scores after six session intervention of experimental and control group for pain on forceful middle finger extension in tennis elbow were shown in table-8.

Experimental group			**Control group**		
Subjects	Post test score	Rank	Subjects	Post test score	rank
T_1	2	5	C_1	3	10
T_2	2	5	C_2	4	12
T_3	2	5	C_3	5	13
T_4	3	10	C_4	2	5
T_5	2	5	C_5	6	14
T_6	2	5	C_6	2	5
T_7	1	1	C_7	3	10
Total	14	36		25	69

Table-9: Reduction of pain during forceful middle finger extension on experimental and control group with rank

Here,

n_1 = the number of the subjects in control group= 7

n_2 = the number of the subject in experimental group= 7

T_x = the larger rank total =69

n_x = the number of the subjects in the condition with larger rank total. That is control group = 7

Now ‘U’ formula:

$$U = n_1 n_2 + \frac{n_x(n_x+1)}{2} - T_x$$

$= 7 \times 7 + \frac{7(7+1)}{2} - 69$

$= 49 + 28 - 69$

$= 77 - 69$

$= 8$

The U-value is 8. The critical value of U at $p \leq 0.05$ is 11. Therefore, the result is significant at $p \leq 0.05$

Pain during Turn a doorknob or key or open a jar: Reduction of pain scores after six session intervention of experimental and control group for pain during turn a doorknob or key or open a jar in tennis elbow were shown in table-9.

Experimental group			**Control group**		
Subjects	Post test score	Rank	Subjects	Post test score	rank
T_1	1	2	C_1	4	12
T_2	2	6.5	C_2	5	14
T_3	1	2	C_3	4	12
T_4	3	10	C_4	2	6.5
T_5	2	6.5	C_5	4	12
T_6	2	6.5	C_6	2	6.5
T_7	1	2	C_7	2	6.5
Total	12	35.5		23	69.5

Table-10: Reduction of pain during turns a doorknob or key or opens a jar on experimental and control group with rank

Here,

n_1 = the number of the subjects incontrol group= 7

n_2 = the number of the subject in experimental group= 7

T_x = the larger rank total =69.5

n_x = the number of the subjects in the condition with larger rank total. That is control group = 7

Now 'U' formula:

$$U = n_1 n_2 + \frac{n_x(n_x+1)}{2} - T_x$$

$= 7 \times 7 + \frac{7(7+1)}{2} - 69.5$

$= 49 + 28 - 69.5$

$= 77 - 69.5$

$= 7.5$

The U-value is 7.5. The critical value of U at p≤ 0.05 is 11. Therefore, the result is significant at p≤ 0.05

Pain on palpation: Reduction of pain scores after six session intervention of experimental and control group for pain on palpation in tennis elbow were shown in table-10.

Experimental group			**Control group**		
Subjects	Post test score	rank	Subjects	Post test score	rank
T_1	1	2.5	C_1	4	12.5
T_2	1	2.5	C_2	2	7
T_3	1	2.5	C_3	5	14
T_4	1	2.5	C_4	3	10.5
T_5	2	7	C_5	4	12.5
T_6	2	7	C_6	2	7
T_7	2	7	C_7	3	10.5
Total	10	31		23	74

Table-11: Reduction of pain on palpation on experimental and control group with rank

Here,

n_1 = the number of the subjects in control group= 7

n_2 = the number of the subject in experimental group= 7

T_x = the larger rank total =74

n_x= the number of the subjects in the condition with larger rank total. That is control group = 7

Now 'U' formula:

$$U = n_1 n_2 + \frac{n_x(n_x+1)}{2} - T_x$$

$$= 7 \times 7 + \frac{7(7+1)}{2} - 74$$

$$= 49 + 28 - 74$$

$$= 77 - 74$$

$$= 3$$

The U-value is 3. The critical value of U at $p \leq 0.05$ is 11. Therefore, the result is significant at $p \leq 0.05$.

Variables in the study statistically significant or not significant at the following level of significance:

No.	Variables Calculated	Observed 'U' value	The critical value of U at $p \leq 0.05$ is	Significant or not significant
1.	Resting pain	8	11	Not significant
2.	Pain on forceful wrist Extension	6	11	Significant
3.	Pain on forceful grip	9	11	Significant
4.	Pain on repeated arm movement	5	11	Significant
5.	Pain on cozen test	16	11	Not significant
6.	Pain on forceful middle finger Extension	8	11	Significant
7.	Pain during Turn a doorknob or key or open a jar	7.5	11	Significant
8.	Pain on palpation	3	11	Significant

Table-12: Variables in this study with level of significance

To be significant at one of these levels, the ‘U’ value must be equal to or smaller than the value at the intersection point.

CHAPTER-V DISCUSSION

The purpose of this study was to evaluate the effectiveness of myofascial release with conventional physiotherapy compare to only conventional physiotherapy for tennis elbow. In this experimental study 14 patients with tennis elbow were randomly assigned to the experimental group and to the control group. Among these 14 patients, 7 patients were included in the experimental group who received myofascial release with conventional physiotherapy and the rest of the 7 patients were included in the control group, who received conventional physiotherapy only. Each group attended for 6 sessions of treatment within three weeks in the physiotherapy outdoor department of CRP Savar in order to demonstrate the improvement. The outcome was measured by using numeric pain rating scale for pain intensity in different functional position.

The researcher found significant improvement of pain. In Experimental group, Mean difference of reduction of resting pain was 5.1which were 1 times more than Mean difference in control group. Also there was significant improvement of pain in forceful wrist extension, forceful grip, repeated arm movement, cozen test, middle finer test, during turning a doorknob or open a jar, on palpation, as the mean difference were consecutively 2, 1.9, 2.3, 1.9, 1.7, 2.2 and 2.2 times more than control group.

The U value is 8 during resting pain. The critical value of U at $p \leq 0.05$ is 11. Therefore the result is significant at $p \leq 0.05$ at one tailed hypothesis. So, the difference is statistically significant in resting pain.

The researcher found a statistical significant decrease of pain on forceful wrist extension ($p \leq 0.05$), pain on forceful grip ($p < 0.05$), pain on repeated arm movement ($p < .05$), pain on forceful middle finger extension ($p < 0.05$), pain during turn a doorknob or key or open a jar ($P < .05$), pain on palpation ($p < 0.05$).

The U value is 16 during cozen test, which is more than 11. Therefore the result is not significant at $p \leq 0.05$ at one tailed hypothesis. So, the difference is statistically not significant during cozen test.

Ajimsha et al. (1012) conducted a single blind RCT to investigate the effect of myofascial release vs. shum ultrasound on pain and function in 65 computer professionals suffering from chronic lateral LE. Both groups were similar in baseline characteristics such as gender, age, body mass index, seniority and duration of symptoms. The treatment intervention was three days per weeks for four weeks. They use patient rated tennis elbow evaluation for measurement of pain. They concluded that MFR technique is more effective than control group.

Khuman et al. (2013) did an experimental study on 30 participants with chronic lateral epicondylitis, of myofascial release technique and outcome measures were decrease pain, improve functional performance and improve grip strength. Results showed that the myofascial release technique significantly improved pain, grip strength and functional activity.

Trividi et al. (2014) did an experimental study on 36 patients with LE to investigate the comparison of active releasing technique and myofascial release technique on pain, grip strength and functional performance. They concluded that after 12 sessions of treatment both active release technique and myofascial release technique were effective in the treatment of chronic lateral epicondylitis but myofascial release technique was found superior than active release technique.

In this Research, Researcher found improvement in reduction of pain during rest, pain in forceful wrist extension, forceful grip, repeated arm movement, cozen test, middle finer test, during turning a doorknob or open a jar, on palpation in experimental group than the control group.

CHAPTER-VI CONCLUSION

The result of this experimental study have identified the effectiveness of conventional physiotherapy with myofascial release are better treatment than the conventional physiotherapy alone for reducing pain and disability in tennis elbow patient. Participants in the experimental group showed a greater benefit than those in the control group, which indicate that the conventional physiotherapy with myofascial release can be an effective therapeutic approach for patient with tennis elbow.

Myofascial release technique is used along with conventional physiotherapy that aims to reduce pain on lateral epicondyle, to facilitate rehabilitation program. It is a cost effective treatment alternative for many common injuries & overuse syndrome which is effective for restoring the joint play and for establishing proper structural alignment. So it may become helpful for patients with tennis elbow to determine myofascial release with conventional physiotherapy as intervention for reducing the features of tennis elbow.

From this research the researcher wishes to explore the effectiveness of myofascial release along with conventional physiotherapy to reduce the features of patient with tennis elbow, which will be helpful to facilitate their rehabilitation and to enhance functional activities.

Recommendations

For future studies, the following recommendations may be made:

- A larger sample size may improve the statistical significance of some of the results.
- A longer time frame and long-term follow-up examination may prove valuable in showing the long-term effect of the treatment
- Double blinding procedure should maintain to reduce biasness.
- It is also recommended to include the functional outcome assessment of patient and to identify the average number of sessions that are needed to be discharged from treatment to validate the treatment technique.

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APPENDIX

APPENDIX-A

মৌখিক সম্মতিপত্র

আসসালামু আলাইকুম/নমস্কার,

আমি তা্সনুবা তাবাসসুম ফারুকী,ঢাকা বিশ্ববিদ্যালয়ের মেডিসিন অনুষদের অধীনে বাংলাদেশ হেল্থ প্রফেশন ইনস্টিটিউট (বিএইচপিআই) এর বিএসসি ইন ফিজিওথেরাপি বিভাগের ৪র্থ বর্ষের শিক্ষার্থী। আমার প্রাতিষ্ঠানিক কাজ কর্মের অংশ হিসাবে আমাকে একটি গবেষণা করতে হবে। নিম্নোক্ত তথ্যাদি পাঠ করার পর অংশগ্রহণকারীদের অধ্যয়নে অংশ গ্রহন করার জন্য অনুরোধ করা হল।

আমার গবেষণার বিষয় হল টেনিস এলবো রোগীদের জন্য "মায়োফাসিয়ালরিলিজ" এর কার্যকারীতা। এই পরীক্ষামূলক গবেষণার মাধ্যমে আমি একটি অনুমান পরীক্ষা করবো যে, টেনিস এলবোরোগীদের ক্ষেত্রে শুধুমাত্র প্রচলিত থেরাপি অপেক্ষা প্রচলিত থেরাপির সাথে মায়োফাসিয়ালরিলিজ বেশী কার্যকরি হবে। আমার গবেষণার উদ্দেশ্য হল এলবো রোগী টেনিসদের ব্যথা কমানোর জন্য মায়োফাসিয়াল রিলিজ এর কার্যকারীতা খুজে বের করা। আমি যদি এই গবেষণাটি সফলভাবে সম্পূর্ণ করতে পারি তাহলে যেসব রোগীরা টেনিস এলবো জনিত সমস্যায় ভুগছেন তারা উপকৃত হবেন এবং এটি একটি গবেষণামূলক প্রমান।

গবেষণাটি সম্পাদনের জন্য, আমার তথ্য সংগ্রহ করা প্রযোজন হবে। গবেষণার ক্ষেত্র বিবেচনা করে আপনার মধ্যে আমারগবেষণায় অংশগ্রহন করার জন্য প্রযোজনীয় বৈশিষ্ট্য লক্ষ্য করা গেছে। এজন্য আপনি আমারগবেষণার একজন সম্মানিত অংশগ্রহণকারী হতে পারেন এবং আমি আপনাকে আমার গবেষণায় অংশগ্রহণের জন্য অনুরোধ জানাচ্ছি। আপনার নিয়মিত থেরাপির সময় আমি আপনার সাথে কয়েকবার দেখা করব। যে চিকিৎসা পদ্ধতি প্রয়োগ করা হবে তা আপনার জন্য ব্যাথামুক্ত এবং নিরাপদ।

আমি আপনাকে অবগত করছি যে এটিএকটিসম্পূর্ণ প্রাতিষ্ঠানিক গবেষণা এবং এটি অন্য কোন উদ্দেশ্যে ব্যবহার হবে না। আমি আপনাকে আরও নিশ্চত করছি যে আপনার সব তথ্য গোপন রাখা হবে। আপনার অংশগ্রহণ হবে ইচ্ছাকৃত। এই গবেষণা থেকে আপনি যে কোন মুহূর্তে সম্মতি প্রত্যাহার করতে পারেন কিংবা অংশগ্রহণ থেকে বিরত থাকতে পারেন। আপনার যদি এই গবেষণা সম্পর্কে এবং অংশগ্রহণকারী হিসাবে আপনার অধিকার সম্পর্কে কোন জিজ্ঞাসা থাকে তবে আপনি আমার সাথে যোগাযোগ করতে পারেন।

শুরু করার পূর্বে আপনার কি কোন প্রশ্ন আছে? আমি কি আপনার সাক্ষাত্কার গ্রহণের সম্মতি পেয়েছি?

হ্যা..... না.....

আমি .....এই সম্মতিপত্র টি পড়েছি এবং বুঝেছি। আমি স্বেচ্ছায়ে এই গবেষণার অন্তর্ভুক্ত হচ্ছি।

প্রশ্নকর্তার স্বাক্ষরঃ.....

অংশগ্রহণকারীর স্বাক্ষরঃ.....

সাক্ষীর স্বাক্ষরঃ.....

INFORM CONSENT

Assalamu-alaikum /Namaskar,

I am Tasnuba Tabassum Faruki student of B.Sc. in physiotherapy at Bangladesh Health Professions Institute (BHPI), CRP. I shall have to conduct a research and it is a part of my academic activity. The participants are requested to participate in the study after reading the following.

My research title is "Effectiveness of myofascial release for the patients with tennis elbow." Through this experimental research I will test the hypothesis "Myofascial release with conventional physiotherapy is better than only conventional physiotherapy for the treatment of tennis elbow patient." The objective of my study is to identify the effectiveness of myofascial release to reduce pain in tennis elbow patient. If I can complete this study successfully, patient may get the benefits who have been suffering from tennis elbow and it will be an evidence based treatment.

To fulfil my research project, I need to collect data. Considering the area of my research, which criteria is necessary for my research is present of you. So, you can be a respected participant of my research and I would like to request you as a subject of my study. I want to meet you a few couple of session, during your regular therapy. The exercises that will be given are pain free and safe for you.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. I assure that all data will be kept confidential. Your participation will be voluntary. You may have the right to withdraw consent and discontinue participation at any time of the experiment. You also have the right to answer a particular question that you don't like.

If you have any query about the study or right as a participant, you may contact with me.

Do you have any questions before I start?

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

Yes …… No……

Signature of the Interviewer……

I…….. Have read and understand the contents of the form. I agree to participate in the research without any force.

Signature of the participant ……

Signature of the witness……

APPENDIX- B

Questioner (Bangla)

চিকিৎসার পূর্বেব্যথারপরিমান

খণ্ড –এ(১)রোগীর সম্পর্কে বর্ণনা

এই প্রশ্নপত্র শুধুমাত্র লেটারাল এপিকনডাইলাইটিস বা টেনিস এলবো রোগীদের ব্যথা পরিমাপ করার জন্য করা হয়েছে এবং এই অংশ টুকু ফিওথেরাপিস্ট পেন্সিল দ্বারা পূরণ করবে।

কোডনং-

রোগীর নাম- পেশা-

বয়স- ঠিকানা-

পুরুষ / মহিলা - তারিখ-

আপনি কোন হাতে বেশি কাজ করেন –

১. আপনার প্রধান সমস্যা কোনটি? (যেগুলো সঠীক সেগুলো গোল করুন)

I. কনুই ব্যথা

II. হাতের মাংসপাশীর দুর্বলতা

III. আপনার হাত অবশ অনুভব করা

IV. হাত বিকৃতি হয়ে যাওয়া

V. সাম্প্রতিক হাতে কোন আঘাত পাওয়া

2. বর্তমান সমস্যা কতদিন থেকে হচ্ছে?

বছর ..... মাস ..... সপ্তাহ .....

৩. কোন হাতে ব্যাথা?

দান/ উভয়/ বাম

৪.আপনার কনুই এর কোন অংশে ব্যাথা?

ভিতরের দিকে/সামনে / পিছনের দিকে/ বাহিরের দিকে

৫.আপনি কি বারবার কোন কাজ করেন অথবা বেশি শক্তি প্রয়োগ করে কোন কাজ করেন?

হ্যাঁ ☐

না ☐

খণ্ড বি –(১) ব্যথার পরিমাণ

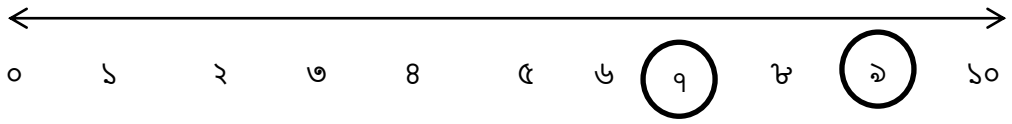
এই প্রশ্নাবলী টেনিস এলবো রোগীদের জন্য সাজানো হোয়েছে। McCaffery et al. (১৯৯৯) রোগীদের ব্যথার অভিজ্ঞতা বর্ণনা করার জন্য নিওমেরিক পেইন রেটিং স্কেল ব্যবহার করেন। এটি একটি সংখ্যাসূচক স্কেল যা ব্যথার পরিমান নির্ধারণ করে। এটি একটি 10cm দীর্ঘ স্কেল যেখানে ০-১০ পর্যন্ত সংখ্যা দেওয়া আছে। এখানে (০) মানে কোন ব্যথা নেই (১-৩) মানে হাল্কা ব্যথা (৪-৬) মানে সহনীয় ব্যথা এবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

প্রশ্নাবলীর এই অংশ একটি কালো বা নীল বল কলম ব্যবহার করে রোগী পূরণ করবে। রোগী কোন প্রশ্ন বুঝতে নাপারলে, ফিজিওথেরাপিস্ট সে অংশটি বুঝতে সাহায্য করবেন।

0-10 থেকে একটি স্কেল যা আপনার ব্যথা বর্ণনা করে, একটি বৃত্তের মাধ্যমে আপনার কনুইতে ব্যথার গড় পরিমান চিহ্নিত করুন। এখানে ০ হচ্ছে কোন ব্যথা নেই এবং ১০ হচ্ছে তীব্র ব্যথা।

উদাহরণ সরূপ

যদি কারো ব্যথার পরিমাণ হয় ৭ থেকে ৯ এর মধ্যে তাহলে সে পূরণ করবে-



এখানে শূন্য (০) মানে কোন ব্যথা নেই (১-৩) মানে হালকা ব্যথা (৪-৬) মানে সহনীয় ব্যথা এবং (৭-১০) মানে তীব্র ব্যথা।

১। স্বাভাবিক বিশ্রামে থাকাকালীন আপনার ব্যথা কতটুকু তীব্র হয়?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে (০) মানে কোন ব্যথা নেই (১-৩)মানে হাল্কা ব্যথা (৪-৬) মানে সহনীয় ব্যথাএবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

২। বলপূর্বক কব্জি সোজা করার সময় আপনার কনুই এর ব্যথা কতটুকু তীব্র হয়?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে (০) মানে কোন ব্যথা নেই (১-৩)মানে হাল্কা ব্যথা (৪-৬) মানে সহনীয় ব্যথা এবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

৩। বলপূর্বক হাত মুষ্টি করার সময় আপনার কনুই এর ব্যথা কতটুকু তীব্র হয়?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে (০) মানে কোন ব্যথা নেই (১-৩)মানে হাল্কা ব্যথা (৪-৬) মানে সহনীয় ব্যথাএবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

৪। যখন আপনি হাতের নড়াচড়ার মাধ্যমে একটি কাজ বারবার করেন তখন আপনার ব্যথার তীব্রতা কতখানি ?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে (০) মানে কোন ব্যথা নেই (১-৩)মানেহাল্কাব্যথা (৪-৬) মানেসহনীয়ব্যথাএবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

৫। বলপূর্বক হাত মুষ্টি করে কনুই থেকে কব্জির উপর পর্যন্ত অংশ উপুড় করে এবং কব্জি ভিতরের দিকে বাকিয়ে সোজা করার সময় (কোজেন টেস্ট) আপনার ব্যথা কতটুকু তীব্র হয়?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে (০) মানে কোন ব্যথা নেই (১-৩)মানেহাল্কাব্যথা (৪-৬) মানেসহনীয়ব্যথাএবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

৬। বলপূর্বক হাতের তৃতীয় আঙ্গুল সোজা রেখে উপরের দিকে উঠানোর সময় আপনার ব্যথা কতটুকু তীব্র হয়?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে (০) মানে কোন ব্যথা নেই (১-৩)মানে হাল্কা ব্যথা (৪-৬) মানে সহনীয় ব্যথা এবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

৭। দরজার তালা খোলার সময়, বোতল এর মুখ খোলার সময় আপনার ব্যথা কতটুকু তীব্র হয়?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে (০) মানে কোন ব্যথা নেই (১-৩)মানেহাল্কাব্যথা (৪-৬) মানেসহনীয়ব্যথাএবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

৮। আক্রান্ত স্থানে হাত দিয়ে অনুভব করার সময় আপনার ব্যথা কতটুকু তীব্র হয়?

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০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে (০) মানে কোন ব্যথা নেই (১-৩)মানে হাল্কা ব্যথা (৪-৬) মানে সহনীয় ব্যথা এবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

তারিখ……গবেষকের সাক্ষর……

চিকিৎসার পরে ব্যথার পরিমান

খণ্ড –এঃ(2) রোগীর সম্পর্কে বর্ণনা

এই প্রশ্নপত্র শুধুমাত্র লেটারাল এপিকনডাইলাইটিস বা টেনিস এলবো রোগীদের ব্যথা পরিমাপ করার জন্য করা হয়েছে এবং এই অংশ টুকু ফিওথেরাপিস্ট পেন্সিল দ্বারা পূরণ করবে।

কোডনং-

রোগীর নাম- পেশা-

বয়স- ঠিকানা-

পুরুষ / মহিলা - তারিখ-

আপনি কোন হাতে বেশি কাজ করেন –

১.আপনার প্রধান সমস্যা কোনটি? (যেগুলো সঠীক সেগুলো গোল করুন)

I. কনুই ব্যথা

II. হাতের মাংসপাশীর দুর্বলতা

III. আপনার হাত অবশ অনুভব করা

IV. হাত বিকৃতি হয়ে যাওয়া

V. সাম্প্রতিক হাতে কোন আঘাত পাওয়া

২. বর্তমান সমস্যা কতদিন থেকে হচ্ছে?

বছর ..... মাস ..... সপ্তাহ .....

৩. কোন হাতে ব্যাথা?

ডান উভয / বাম /

৪.আপনার কনুই এর কোন অংশে ব্যাথা?

ভিতরের দিকে/সামনে /বাহিরের দিকে/ পিছনের দিকে

৫.আপনি কি বারবার কোন কাজ করেন অথবা বেশি শক্তি প্রয়োগ করে কোন কাজ করেন?

হ্যাঁ ☐

না ☐

খণ্ড – বি (2) ব্যথার পরিমাণ

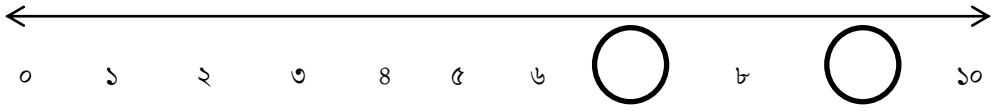
এই প্রশ্নাবলী টেনিস এলবো রোগীদের জন্য সাজানো হোয়েছে। McCaffery et al. (১৯৯৯) রোগীদের ব্যথার অভিজ্ঞতা বর্ণনা করার জন্য নিওমেরিক পেইন রেটিং স্কেল ব্যবহার করেন। এটি একটি সংখ্যাসূচক স্কেল যা ব্যথার পরিমান নির্ধারণ করে। এটি একটি 10cm দীর্ঘ স্কেল যেখানে ০-১০ পর্যন্ত সংখ্যা দেওয়া আছে। এখানে (০) মানে কোন ব্যথা নেই (১-৩) মানে হাল্কা ব্যথা (৪-৬) মানে সহনীয় ব্যথা এবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

প্রশ্নাবলীর এই অংশ একটি কালো বা নীল বল কলম ব্যবহার করে রোগী পূরণ করবে। রোগী কোন প্রশ্ন বুঝতে নাপারলে, ফিজিওথেরাপিস্ট সে অংশটি বুঝতে সাহায্য করবেন।

0-10 থেকে একটি স্কেল যা আপনার ব্যথা বর্ণনা করে, একটি বৃত্তের মাধ্যমে আপনার কনুইতে ব্যথার গড় পরিমান চিন্নিত করুন। এখানে ০ হচ্ছে কোন ব্যথা নেই এবং ১০ হচ্ছে তীব্র ব্যথা।

উদাহরণ সরূপ

যদি কারো ব্যথার পরিমাণ হয় ৭ থেকে ৯ এর মধ্যে তাহলে সে পূরণ করবে-



এখানে শূন্য (০) মানে কোন ব্যথানেই (১-৩) মানে হালকা ব্যথা (৪-৬) মানে সহনীয় ব্যথা এবং (৭-১০) মানে তীব্র ব্যথা।

১। স্বাভাবিক বিশ্রামে থাকাকালীন আপনার ব্যথা কতটুকু তীব্র হয়?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে (০) মানে কোন ব্যথা নেই (১-৩)মানে হাল্কা ব্যথা (৪-৬) মানে সহনীয় ব্যথা এবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

২। বলপূর্বক কব্জি সোজা করার সময় আপনার কনুই এর ব্যথা কতটুকু তীব্র হয়?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে (০) মানে কোন ব্যথা নেই (১-৩)মানে হাল্কাব্যথা (৪-৬) মানে সহনীয় ব্যথা এবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

৩। বলপূর্বক হাত মুষ্টি করার সময় আপনার কনুই এর ব্যথা কতটুকু তীব্র হয়?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে (০) মানে কোন ব্যথা নেই (১-৩)মানে হাল্কাব্যথা (৪-৬) মানে সহনীয় ব্যথা এবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

৪। যখন আপনি হাতের নড়াচড়ার মাধ্যমে একটি কাজ বারবার করেন তখন আপনার ব্যথার তীব্রতা কতখানি।

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে (০) মানে কোন ব্যথা নেই (১-৩)মানে হাল্কা ব্যথা (৪-৬) মানে সহনীয় ব্যথা এবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

৫। বলপূর্বক হাত মুষ্টি করে কনুই থেকে কব্জি উপর পর্যন্ত অংশ উপুড় করে এবং কব্জি রেডিয়াসের দিকে বাকিয়ে সোজা করার সময় (কোজেন টেস্ট) আপনার ব্যথা কতটুকু তীব্র হয়?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে (০) মানে কোন ব্যথা নেই (১-৩) মানে হাল্কা ব্যথা (৪-৬) মানে সহনীয় ব্যথা এবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

৬। বলপূর্বক হাতের তৃতীয় আঙ্গুল সোজা রেখে উপরের দিকে উঠানোর সময় আপনার ব্যথা কতটুকু তীব্র হয়?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে (০) মানে কোন ব্যথা নেই (১-৩) মানে হাল্কা ব্যথা (৪-৬) মানে সহনীয় ব্যথা এবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

৭। দরজার তালা খোলার সময়, বোতল এর মুখ খোলার সময় আপনার ব্যথা কতটুকু তীব্র হয়?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে (০) মানে কোন ব্যথা নেই (১-৩)মানে হাল্কা ব্যথা (৪-৬) মানে সহনীয় ব্যথা এবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

৮। আক্রান্ত স্থানে হাত দিয়ে অনুভব করার সময় আপনার আপনার ব্যথা কতটুকু তীব্র হয়?

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০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে (০) মানে কোন ব্যথা নেই (১-৩)মানে হাল্কা ব্যথা (৪-৬) মানে সহনীয় ব্যথা এবং (৭-১০) মানে হচ্ছে তীব্র ব্যথা।

তারিখ……। গবেষকের সাক্ষর……।

Questionnaire (English)

Pre test

SECTION-A (1): Subjective Information

This questionnaire is developed to measure the pain of the patient with tennis elbow. And this section will be filled by physiotherapist using a pencil.

Patient code no.

Patients name: Occupation:

Age: Address:

Sex: Date:

Hand dominant:

1. What is the main issue that brought you in today (circle all that are appropriate)?

I. Pain in elbow
II. Weakness of the forearm muscle
III. Numbness or tingling in your arm:
IV. Deformity
V. Recent injury

2. How long has the current problem been going on?

Years…….. Months…… Weeks……..

3. Which side is involved? (Encircle the side)

Right/Left/Both

4. What part of your elbow hurts?

Front /medial/lateral/Back

5. Do you perform any repetitive or forceful tasks or movements?

Yes: ☐

No: ☐

ECTION-B (2)**: Pain Status**

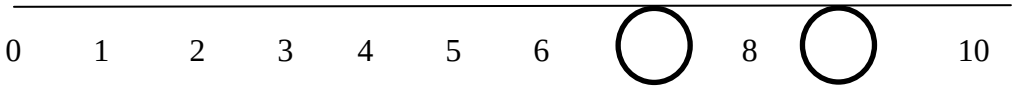
This questionnaire is designed for tennis elbow patients. McCaffery et al. (1999) used a numeric scale to rate the pain status experienced by patients. It is known as Numeric Pain Rating Scale. The scale is a 10cm long scale ranging from 0-10. Here a zero (0) means no pain, 1-3 indicates mild pain, 3-5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

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

Rate the average amount of pain in your elbow 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.

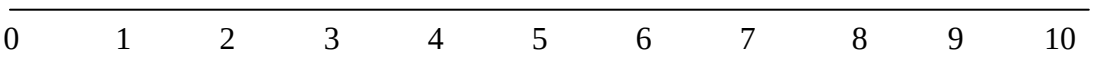
For example-

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



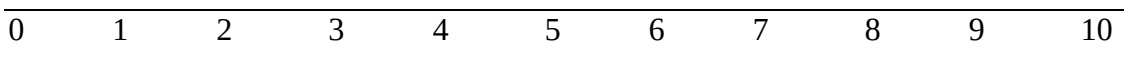
A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain

1. How severe your pain is at resting position?



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

2. How severe is your pain during forceful wrist extension?



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

3. How severe is your pain during a strong grasp?

0 1 2 3 4 5 6 7 8 9 10

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

4. How severe is your pain when doing a task with repeated arm movement

0 1 2 3 4 5 6 7 8 9 10

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

5. How severe is your pain when making a fist with pronation of forearm, and radial deviation and extension of wrist while the examiner resists the motion (cozen test)

0 1 2 3 4 5 6 7 8 9 10

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

6. How severe is your pain during forceful middle finger extension?

0 1 2 3 4 5 6 7 8 9 10

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

7. How severe is your pain during Turn a doorknob or key or Open a jar?

0 1 2 3 4 5 6 7 8 9 10

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

8. How severe is your pain on palpation to the affected side?

0 1 2 3 4 5 6 7 8 9 10

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

Date: …….. Signature of Examiner:…….

Questionnaire (English)

Post test

SECTION-A (2): Subjective Information

This questionnaire is developed to measure the pain of the patient with tennis elbow. And this portion will be filled by physiotherapist/researcher using a pencil.

Code No:

Patients name: Occupation:

Age: Address:

Sex: Date:

Hand dominant:

1. What is the main issue that brought you in today (circle all that are appropriate)?

I. Pain in elbow
II. Weakness of the forearm muscle
III. Numbness or tingling in your arm:
IV. Deformity
V. Recent injury

2. How long has the current problem been going on?

Years…….. Months…… Weeks……..

3. Which side is involved? (Encircle the side)

Right/Left/Both

4. What part of your elbow hurts?

Front /medial/lateral/Back

5. Do you perform any repetitive or forceful tasks or movements?

Yes: ☐

No: ☐

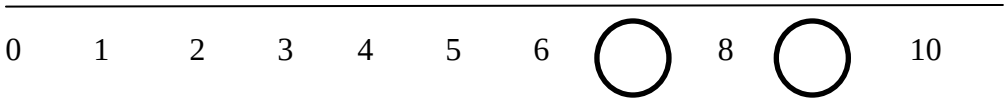
SECTION-B (2): Pain Status

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

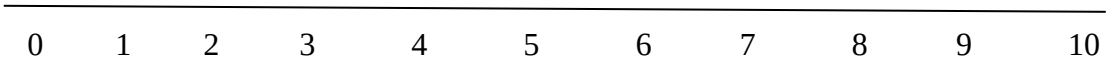
Rate the average amount of pain in your elbow by encircling the number that best describes your pain on a scale from 0-10. A zero (0) represents no pain and a ten (10) represents worst pain you have ever experienced.

If any participants have pain between 7 to 9 at Numeric Pain Rating Scale than he/ she will fill up:



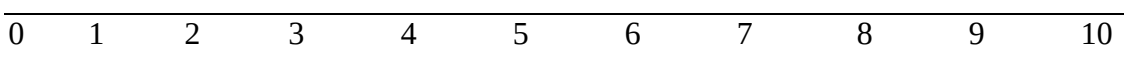
A Zero (0) means no pain (1-3) means mild pain (4-6) means moderate pain and (7-10) means severe pain

1. How severe your pain is at resting position?



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

2. How severe is your pain during forceful wrist extension?



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

3. How severe is your pain during a strong grasp?

0 1 2 3 4 5 6 7 8 9 10

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

4. How severe is your pain when doing a task with repeated arm movement

0 1 2 3 4 5 6 7 8 9 10

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

5. How severe is your pain when making a fist with pronation of forearm, and radial deviation and extension of wrist while the examiner resists the motion
(Cozen test)

0 1 2 3 4 5 6 7 8 9 10

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

6. How severe is your pain during forceful middle finger extension?

0 1 2 3 4 5 6 7 8 9 10

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

7. How severe is your pain during Turn a doorknob or key oropen a jar?

0 1 2 3 4 5 6 7 8 9 10

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

8. How severe is your pain on palpation to the affected side?

0 1 2 3 4 5 6 7 8 9 10

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

Date: …….. Signature of Examiner:…….

March 07, 2015

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

Through: Head, Department of Physiotherapy, BHPI

Subject: Seeking permission to collect data to conduct my research project on "Effectiveness of myofascial release for the patients with tennis elbow".

Dear Sir,

With due respect and humble submission to state that I am Tasnuba Tabassum Faruki, a student of 4th Professional B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). As per approval of ethical review committee of BHPI, I have been conducting a research project on "Effectiveness of myofascial release for the patients with tennis elbow". Mr. Nasirul Islam, Associate Professor of BHPI has been supervising me in order to accomplish this study. However, conducting this research project is partial of the requirement for the degree of B.Sc. in Physiotherapy. I want to collect necessary data from the patients attending at ~~neurology~~ MS outpatient department of CRP Savar and Mirpur. Therefore I need to obtain your kind written permission to initiate data collection from the targeted patients. I would like to assure that ethical principles would be followed as per guidelines of my institution/department.

I therefore, pray and hope that you would be kind enough to grant my application and permit me to collect required data to accomplish my research objectives.

Yours faithfully,
Tasnuba Tabassum Faruki
07-03-15
Tasnuba Tabassum Faruki
4th Professional B.Sc. in Physiotherapy
Session: 2009-2010
Bangladesh Health Professions Institute (BHPI)
(An academic institution of CRP)
CRP-Chapain, Savar, Dhaka-1343.

Forwarded
Nasir-I
07/03/15

Forwarded for approving
09/03/15

Given permission for data collection from MS-Unit, PT Dept, CRP. Please contact with Mrs. Shamima Islam Nipa, CPT as a counterpart.
09/03/15

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