Effectiveness of low-grade spinal mobilization for the patients with chronic neck pain.

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We the undersigned 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 LOW GRADE SPINAL MOBILIZATION FOR THE PATIENT WITH CHRONIC NECK PAIN.

Submitted by **Mahmudul Hasan**, for the partial fulfilment of the requirement for the degree of Bachelor of Science in Physiotherapy (B.Sc. PT).

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DECLARATION

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

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Acronyms

&	**And**
CRP	Centre for the rehabilitation of the paralyzed
NP	Neck pain
NPRS	Numeric pain rating scale
NDI	Neck pain disability index
NSAIDs	Non-steroidal anti-inflammatory drugs
MRI	Magnetic resonance imaging
ROM	Range of motion

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Abstract

Purpose: To find out the effectiveness of low-grade spinal mobilization for the patients with chronic neck pain. **Objectives**: To assess the effect on pain and disability of neck pain patients after applying low grade spinal mobilization along with conventional physiotherapy. **Methodology:** The study was a quantitative clinical trial. 20 patients were allocated based on inclusion and exclusion criteria. The age range was 24- 53 years old. They received 6 sessions of treatment for 2weeks. Numeric pain rating scale (NPRS) & NPDI were used in the study to see the effectiveness in the pretest and posttest values of pain and disability. **Results:** Among 20 participants with chronic neck pain in this study, 10 participants received conventional physiotherapy and 10 participants received low grade spinal mobilization along with conventional physiotherapy. Each participant of both experimental and control group scored on Numeric Pain Rating Scale (NPRS) and NPDI before and after completion of treatment. Wilcoxon Signed ranked test applied to the post-test pain score of the participants in both groups were revealed a statistically significant difference at the level of P= 0.000 (P< 0.05). Following application of treatment, the study found that the control group showed a significant improvement (p<0.05) in some cases than the experimental group. The low grade spinal mobilization along with conventional physiotherapy showed better improvement than only conventional physiotherapy for the patients with chronic neck pain. Though both groups were effective in posttest values and their P values were significant (P< 0.05). The experimental group showed more significance in NPDI index. **Conclusion:** The quantitative clinical trial showed that low grade spinal mobilization along with conventional physiotherapy were more effective than only conventional physiotherapy for the patients with chronic neck pain.

Key words: Manual Mobilization Technique, Neck Pain, Neck Pain Disability Index Questionnaire, Numeric Pain Rating Scale, Range of Motion, Conventional physiotherapy.

CHAPTER-I INTRODUCTION

1.1Background

Neck pain is a public health issue that causes widespread disability in the general population (Pierre et al 2003). Neck pain is a widespread condition, with a 13 percent point prevalence (Bovim G, 1994)4 and a 50 percent lifetime prevalence (Hultz L, 1954) Neck pain is a frequent ailment in modern society, affecting roughly 10% of the general population at any given moment (Donald R. Gore 1998). The prevalence of chronic neck pain is estimated to be variable. In a Swedish community (Guez et al,2002). Neck discomfort was reported by 18.5 percent of females and 13.2 percent of males for more than 6 months; however, when continuous chronicity was considered, these values dropped to 10% and 7%, respectively. Chronic neck discomfort was reported in 13.5 percent of females and 9.5 percent of males in a Finnish study (Makela et al, 1991). Neck pain is a very frequent ailment. Neck pain affects over 70% of adults at some point in their lives, with a frequency of around 22% in the general population (Gemmell & Miller, 2010). Chronic mechanical radiating neck pain is a major health issue that affects people all around the world. A compression or inflammatory disease from a space-occupying lesion such as a disc herniation, spondylitic spur, or cervical osteophyte is the most common cause (Sambyal and Kumar, 2013; Ellenberg, et al., 1994). Any tissue that is subjected to extreme stress will experience discomfort, inflammation, protective spasms, and/or neurological reaction patterns (Vernon, 1988). This, in turn, will result in neck pain. Mechanical neck discomfort is typically related with asymmetrical cervical range of motion restrictions, as well as a history of aberrant posture or trauma (Haslett et al., 2002). Pain is frequently caused by multiple factors, and it is frequently only a symptom, not a diagnosis, of a neck disease (Bergmann et al., 1993). Neck pain patients can benefit from a variety of treatments. Medication, physiotherapy, and patient education are all part of this. Stretching, mobilization, traction, ultrasound, IRR, and myofascial release are some of the physiotherapy treatment procedures that have been devised (Magee, 2006). Early mobility and resumption of a normal active lifestyle will help to improve the results (Prodigy Knowledge, 2005). Neck problems are more likely in people who have weak neck muscles, thus an exercise program to strengthen the neck is a good suggestion (Pillinger & Rutherford, 2005). The goal of

the exercise is to eliminate pain and, where possible, restore normal function, which means regaining full neck mobility or as much movement as possible under the conditions. The exercise should always be followed by postural correction and maintenance of the correct posture (McKenzie, 1983). Every joint complex is affected by multiple systemic factors, including structural (joints), supporting (muscles and ligaments), neurological, and emotional factors (Lee, 2004). The surrounding structures (muscles and joints) should also be treated while treating a spinal region, as evidenced by the preceding studies (Vernon, 1988). Neck discomfort is a common musculoskeletal ailment that can cause varied degrees of disability for the person affected. Neck pain might be accompanied by radiculopathy (pain radiating down the arms) or a headache (cervicogenic headache). Neck discomfort can be treated with manipulation (adjustments to the spine) and mobilization (movement imposed on joints and muscles) alone or in combination with other physiotherapies (Gross A et al., 2015). Mechanical neck discomfort is typically related with asymmetrical cervical range of motion restrictions, as well as a history of aberrant posture or trauma (Haslett et al., 2002). Pain is frequently caused by multiple factors, and it is frequently only a symptom, not a diagnosis, of a neck disease (Bergmann et al., 1993). Neck pain affects two-thirds of the population at some point in their lives (Binder AL 2007). Diagnostic triage is the best and most frequently accepted form of pain classification, in which patients are classified into one of three groups (Waddell G, 1998): significant spinal pathology, neurological involvement, or non-specific pain. Every year, between 27 and 48 percent of workers are affected by NSNP (Peter Rothfels et al 2010). Neck discomfort that isn't particular normally goes away in a few days or weeks, but it might recur or become persistent. Patients with chronic pain treated in secondary care or in the workplace remained symptomatic 20 percent to 78 percent of the time, regardless of the treatment they received (Borghouts et al, 1998). To treat pain and stiffness, Maitland uses passive and auxiliary oscillatory movements applied to the spinal and vertebral joints. Grade I is a low-amplitude exercise that is used to treat severely irritable situations. It is performed below the range of resistance. Grade I allows slack in collagen to be picked up when connective tissue is not loaded, and it can reduce pain by working on neurological processes (Threlkeld 1992). The amplitude of a Grade II mobilization is greater, but it is still below resistance. When palpation elicits discomfort before movement restriction, Grade I and II are appropriate. When there is resistance to movement before pain, grades III and IV are utilized. A Grade III movement is a large amplitude movement that is conducted inside resistance to develop range of motion. Grade IV is a low-amplitude activity

done inside resistance for chronic low-irritability aches. Grade V is a high-velocity manipulation thrust. To deal with muscle spasms, Maitland also recommends stretching treatments (Maitland, 2002, 1998). Physiological mobilizations should be used to pursue the eventual establishment of normal range of motion once the patient is capable of 60 percent of normal range of motion without pain (Maitland 1998). The equivalent pain reaction, according to Maitland, "is almost invariably found with the unphysiological movement rather than the physiological movement."

Neck discomfort affects 15% of men and 23% of women in the general population, with over half of these people enduring chronic, unremitting symptoms. It is predicted that up to 70% of people may experience neck pain at some point in their lives, with 78 percent of men and 85 percent of women reporting full recovery after a 5-year follow-up. The economic cost of neck pain is enormous, and roughly a third of persons who develop neck pain for the first time will continue to use health care for their neck pain after a 5-year follow-up. Furthermore, persons with a primary complaint of neck discomfort account for approximately a quarter of all outpatient physical therapist appointments. Joint mobilization/manipulation (non-thrust and thrust), therapeutic exercise, and traction are some of the strategies and methods used by physical therapists to treat neck discomfort. However, there isn't enough evidence to back up many of the aforementioned management practices. Many commonly used therapies for persons with neck discomfort have insufficient evidence, according to the Philadelphia Panel evidence-based clinical practice guidelines. This discovery could be at least partly to blame for the lack of clinical improvement seen in patients with neck pain as compared to those with low back or lower-extremity pain.

1.2 Rationale

Neck manipulation and mobilization can be performed by physical therapists, chiropractors, traditional bone setters, osteopaths, medical doctors, and massage therapists. A permanent or short-term change in connective tissue length, as well as neurophysiological effects such as analgesic effects, motor effects, and sympathetic nervous system effect dysfunction, are all mechanical consequences of spinal mobilization or manipulation. Movement-based spinal mobilization therapies aim to move the vertebrae through their full range of motion, potentially influencing the spine mechanically and physiologically. Spinal mobilization may improve the real excursion or movement of the spine, removing adhesions and allowing the vertebrae to move freely, lowering discomfort. The procedure may also aid to increase intra neural blood flow and oxygenate the nerve. It's estimated that 50% of the population has suffered from neck and upper extremity pain at some point in their lives.

Many patients' socioeconomic circumstances in our country make long-term physiotherapy treatment unfeasible. As a result, patients suffer more throughout their lives, and patient satisfaction does not remain constant during treatment. The study calculated which treatment is more effective when compared to other or relevant treatments, and I hope that a standardized treatment protocol will be established that will provide the greatest benefit in terms of reducing time, consuming, pain, and cost-effectiveness, so that the individual will be more productive and a significant amount of money will be saved. The goal of the study was to determine the efficacy of low-grade spinal mobilization in patients with chronic neck pain, which was necessary to assess the efficacy of different treatment approaches in the patients' best interests. Spinal mobilization was found to be more successful at reducing pain, increasing range of motion, and reducing disability in this study. As a result, spinal mobilization may be the most effective therapy option for patients suffering from chronic mechanical neck discomfort.

Neck pain is caused by bad posture since the head is supported by the spinal vertebrae when standing erect. The vertebrae do not support the weight of the head as well when the head is flexed forward, such as while using a laptop. To support the head, which is roughly the weight of a bowling ball, muscles, tendons, and ligaments work harder. Due to the high labor necessary to hold the head in position, the muscles and other soft tissues stiffen with time. Stretching the anterior neck muscles weakens them, and neural structures are held in less-than-ideal locations.

Chronic overload and tightening of soft tissues can lead to a reduction in blood flow and oxygen to the soft tissues, resulting in pain. Furthermore, neck joints may be held in unnatural postures, resulting in joint pain and muscular weakness. Tension headaches and uncomfortable "knotty" regions in the neck and upper trapezius muscles are common symptoms of the above (muscles that run from the neck to the shoulder blade). It may appear that simply holding one's head up is difficult, since the head "feels so heavy."

Low-grade spinal mobilization is used to relieve neck and shoulder muscular tension and promote range of motion. It's also utilized to keep your spine and neck in good shape. As a result, it may help to relieve neck pain. There has been no research done to compare the effectiveness of scapular strengthening and stretching exercises with standard physiotherapy for patients with neck pain. The goal of this study is to compare the effectiveness of Scapular strengthening and stretching activities to traditional physiotherapy alone. The findings of this study could aid physiotherapists in providing the best treatment for chronic neck discomfort.

1.3 Aim of the study

To identify the effectiveness of low-grade spinal mobilization for the patients with chronic neck pain.

1.5 Objectives of the study

1.5.1. General Objective

- To determine the effectiveness of low grade spinal mobilization for the patients with chronic neck pain.

1.5.2. Specific Objectives

- To explore socio-demographic (age, gender, marital status, family type, living area, educational status) characteristics of patients with Chronic neck pain.

- To find out the activity limitation for patients with Chronic neck pain.

- To evaluate severity of pain after introducing Low grade spinal mobilization for the patient with Adhesive Capsulitis.

- To measure Improvement of Range of Movement (ROM) for patients with Chronic neck pain.

- To compare pain intensity at different neck movement before and after conventional physiotherapy and conventional physiotherapy with low grade spinal mobilization for the patient with Chronic neck pain.

- To compare functional disability before and after introducing low grade spinal mobilization for the patients with chronic neck pain.

1.5.3. Hypothesis

Null Hypothesis

Ho: $\mu 1-\mu 2 = 0$ or $\mu 1 \geq \mu 2$, where the experimental group and control group mean difference is not same or control group is higher than experimental group.

Alternative Hypothesis

Ha: $\mu 1-\mu 2 \neq 0$ or $\mu 1 \neq \mu 2$ where the experimental group and control group mean difference is not same.

Where,

Ho= Null hypothesis

Ha = Alternative hypothesis

μ1 = Mean difference in initial assessment

μ2 = Mean difference in final assessmen

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1.6 Operational Definition

1.6.1. **Neck pain**

It is a pain full condition in the neck and remote which may be localized or referred.

1.6.2. **Low grade spinal mobilization**

Spinal mobilization (MOB) is defined as the application of manual force to the spinal joints within the passive range of joint motion that does not involve a thrust.

1.6.3. **Conventional physiotherapy**

Physiotherapeutic interventions that are widely accepted and commonly practiced by medical community.

1.7 List of variable

1.7.1. **Independent variable:** Low grade spinal mobilization

1.7.2**. Dependent variable:** Chronic Neck pain.

CHAPTER – II LITERATURE REVIEW

Mechanical neck pain is characterized by pain in the cervical area, which is frequently accompanied by limited range of motion (ROM) and functional limitations. Neck discomfort and its associated impairment are a significant socioeconomic burden on society (Cote, Cassidy, and Carroll, 2000) and the second most common reason for time off work, following low back pain (Albright et al, 2001).

According to a poll conducted in the United Kingdom, 1 in 4 women and 1 in 5 men aged 45 to 75 experienced current neck pain (Neck pain in adults, 2006).

An incidence of 72 percent was recorded in Finland, Norway, and Sweden. In the United States, a 12-month survey found that the prevalence of neck discomfort ranged from 12.1% to 71.5 percent among the unemployed, and 27.1 percent to 47.8% among working (Haldeman et al., 2008)

Over the course of a year, 30 percent to 50 percent of adults will experience neck pain (Quigley, 1976) and many may seek physiotherapy treatment. Physiotherapists typically utilize passive joint mobilization (Jull, 2002) which consists of manual oscillatory pressures applied to the spine, to treat neck discomfort (Yaver, 2007)

Medication, physiotherapy, exercise, local injections, and patient education are all standard therapies for neck discomfort, although their usefulness has been questioned (Bland, 1994).

When paired with exercise, passive joint mobilization appears to be beneficial in treating individuals with neck pain (Spinal manipulation/mobilization ineffective for neck pain: Cochrane review, 2010) and appears to be more cost-effective than other treatments when societal variables such as lost productivity are taken into account (Lewis et al., 2007)

The optimal dose of joint mobilization is unknown, and the forces used by therapists when performing the same technique differ,59 making it difficult to relate therapy outcomes to a specific technique or dose.

Neck pain affects up to 71 percent of the world's adult population at some point in their lives (Fejer et al., 2006). It has also been identified as a significant predictor of sick leave from work (Kääriä et al., 2012). Symptoms do not resolve entirely in 50 percent to 85 percent of patients with neck

pain (Carroll et al., 2008), and 47 percent of people with NP at baseline may acquire persistent symptoms (Cote et al., 2004).

Sedentary lifestyles, office workers, frequent sleep problems, obesity, poor posture, anxiety, depression, increased computer use, changes in work type, being a female, and work-related emotional exhaustion in males are all known risk factors for NP (Haldeman et al., 2010; Kääriä et al., 2012; Paksaichol et al., 2015). Chronic NP is frequently linked to psychosocial dysfunctions and a sedentary lifestyle (Hoy et al., 2010). People are putting extra stress and strain on the upper thoracic and neck regions of their spine as a result of sedentary lifestyles and fast-paced living (Binder, 2007).

Neck pain is treated by about 15% of persons in a hospital-based physiotherapy program and 30% of patients in a chiropractic service (Gross et al., 2000). Neck problems are more likely in people who have weak neck muscles, thus an exercise program to strengthen the neck is a good suggestion (Pillinger & Rutherford, 2005). A physiotherapist might utilize mobilization techniques in conjunction with ultrasound, laser, or heat therapy. Traction, a collar or corset, and TENS are all options for treatment (Moffett, 2004).

Ten percent of the Canadian population suffers from neck ache for one week per month (Ferrari & Russell, 2003). According to these studies, at least 80% of the population suffers from long-term neck pain. In an epidemiological study, neck pain that lasted more than six months was shown to have a 54.2 percent incidence rate. Ten percent of the Canadian population suffers from neck ache for one week per month (Ferrari & Russell, 2003). According to these studies, at least 80% of the population suffers from long-term neck pain. An epidemiological study found that neck pain that lasted more than six months had a 54.2 percent incidence rate (Cote et al., 2000). Neck pain accounts for 15% of all soft tissue problems seen in general practice and is a common reason for physiotherapy referral. In any given year, 30% of adults will experience neck pain, with 5-10% becoming incapacitated as a result. Despite the fact that neck pain is self-limiting and benign, it consumes a significant amount of healthcare expenditures. A recent assessment of ten community physiotherapy departments in the east Yorkshire area found that 1060 (13.4 percent) of the 7899 individuals referred had neck issues (Moffett et al., 2005).

EMG biofeedback, thermotherapy, massage, electrical stimulation, therapeutic exercises, and combined therapies for acute neck pain were shown to be ineffective according to Albright et al.

(2001) guidelines. Short-term follow-up shows that manipulative therapy, mobility, and exercise are more effective than standard care in relieving acute neck pain. Gross et al. (2007) conducted a systematic review to determine whether conservative treatments (such as manual therapies, physical medicine methods, medication, and patient education) improved function/disability, patient satisfaction, and overall perceived effect in adults with mechanical neck disorders.

Exercises mixed with mobilization/manipulation showed intermediate or long-term benefits, according to the findings of this review. Gross et al. (2010) and Kay et al. (2012) recently published Cochrane evaluations that indicated manipulation, mobilization, or exercise can help patients with neck discomfort when used as a single-modal treatment method.

Patients with persistent complaints frequently fail to react to treatment, resulting in substantial direct and indirect costs (Haldeman et al., 2008). According to Martin et al. (2009), the medical cost of treating NP has increased in recent decades. Approximately 5% of patients with NP have significant disabilities (Philadelphia, 2001)

So, because neck discomfort is a very frequent problem, and because physiotherapy is a relatively new and expanding profession in Bangladesh, we need current knowledge to assist both patients and therapists. Although there is minimal physiotherapy study for neck pain patients in Bangladesh, if this field is researched, it could yield positive results for our profession (Islam, 2005). Neck pain is such a common occurrence that it is frequently used to characterize a circumstance, certain persons, an unpleasant task to be completed, or an institution (Bland, 1987). The bones, muscles, ligaments, nerves, and blood arteries that make up the neck contribute to support the head. Neck and shoulder muscles are crucial for a healthy neck. Neck structures can cause pain in a variety of ways. Neck difficulties can be caused by poor posture, accidents, arthritis, or stress, all of which can cause pain and make it difficult to do regular tasks (National Healthcare Group, 2003).

Additionally, cervical mobilization relieves pressure on nerve roots. Individually, these treatments are beneficial for cervicobrachialgia, although there are some drawbacks (Khan, et al., 2015). The results showed that patients who got traditional physiotherapy experienced significant pain relief in their necks. On the Numerical Pain Rating Scale, these individuals showed a decrease in neck pain over the study period, which might be considered a clinically relevant change (Kovacs, et al., 2008).

Gracey, McDonough, and Baxter (2002) identified Maitland mobilization as one of the most commonly utilized manual therapy techniques by physiotherapists. Tuttle (2005) describes Maitland mobilization as a passive oscillatory technique used to treat hypomobile vertebrae.

The analgesic effects in the neck and arm of individuals who received cervical mobilization increased the mechanical interfaces' function (Khan, et al., 2015).

The facet joints are intended to have a better opening and closing function as a result of the mobilization, minimizing compression on brain tissues. Reduced compression in the brain tissues may help to enhance physiological and mechanical circumstances, resulting in analgesic benefits in the upper extremities (Shacklock, 2005). Patients in the experimental group gradually improved more than patients in the control group in terms of cervical range of motion (Shacklock, 2005).

Physiotherapy is a common treatment for individuals with mechanical neck pain, with about 33% of patients seeking treatment from a physiotherapist (Picavet & Schouten, 2003). Massage, exercise therapy, traction, stretching, transcutaneous electrical nerve stimulation (TENS), interferential currents, ultrasound, heat agents, and education are some of the treatments available. Passive manual treatments, such as mobilization or manipulation, are sometimes known as manual therapy and can be specialized by physiotherapists. Surprisingly, there have been inconclusive outcomes regarding these therapies' effectiveness (Gross et al., 2004 & 2007; Kroeling et al., 2013).

In addition, no single intervention is clearly superior to another (Hurwitz et al., 2008). This ambiguity could be due to a small sample size and poor methodological quality in the studies (Hurwitz et al., 2008; Vernon & Humphreys, 2008).

Furthermore, most earlier studies primarily examined subjective results.

There is currently no compelling evidence that cervical mobilization alone is beneficial for patients with NP of any duration (Bronfort et al., 2010; Gross et al., 2004).

Previous research has shown that cervical mobilization is ineffective when done alone (Gross et al., 2004 & 2007). Moderate to high quality evidence in favor of mobilization for chronic non-specific neck pain (Vernon et al., 2007) A course of mobilization alone provided some immediate or short-term pain alleviation (Gross et al., 2010). when mobilization was paired with other

interventions, it had a more beneficial effect and advised the implementation of a multimodal therapy approach (Bussieres et al., 2016; Childs et al., 2008; Gross et al., 2007; Miller et al., 2010; Tsakitzidis et al., 2013). There appears to be no single therapy option that is effective (Gross et al., 2007). As a result, the purpose of this study was to see how well mobilization combined with normal physiotherapy affected pain, disability, neck ROM, and NME in patients with chronic mechanical neck pain. Physiotherapists employ Maitland mobilization as one of the most prevalent manual therapy procedures (Gracey, McDonough, and Baxter, 2002). The methods of Maitland mobilization, which is a passive oscillatory approach used across the hypomobile vertebra level, are considered valid (Tuttle, 2005).

Cervical mobilization with the Maitland technique has been reported to reduce discomfort and restore function in some people (McKinney, Dornan, and Ryan, 1989; Mealy, Brennan, and Fenelon, 1986). Manual therapy appears to provide better short-term pain alleviation than exercise alone, according to high-quality evidence, but no long-term differences for acute neck pain were discovered (Miller et al, 2010). The diversity of therapies evaluated in these trials, ranging from manipulation and eclectic mobilization to strengthening, collar, and no therapy, makes interpreting the results and the effectiveness of specific mobilization techniques difficult.

In general, mobilization is thought to be a safer strategy (Rivett, Shirley, Magarey, and Refshauge, 2006). Bonk et al., 2000; Giebel, Edelmann, and Huser, 1997; McKinney, Dornan, and Ryan, 1989; Mealy, Brennan, and Fenelon, 1986) discovered that cervical mobilization using the Maitland technique improves discomfort and restores function (McKinney, Dornan, and Ryan, 1989; Mealy, Brennan, and Fenelon, 1986). In acute mechanical neck discomfort, unilateral postero-anterior pressure in sitting is superior to unilateral postero-anterior pressure in prone laying. (Lee, Song and Kim, 2015).

Passive joint mobilization, which consists of manual oscillatory stresses applied to joints, is extensively used by physiotherapists on spinal column (Jull, 2002), (Magarey et al., 2004). Some evidence suggests that When it comes to passive joint mobilization, when it comes to addressing neck discomfort, It appears to be more cost-effective than other options when paired with exercise (Gross A et al., 2010). when societal problems, such as poverty, are involved Consideration is given to lost production. (Lewis et al., 2007). The ideal dose of joint mobilization, on the other hand, is unknown, as are the forces involved. When executing the procedure, therapists apply The

same technique is used in different ways, which makes it tough. to assign treatment outcomes to a certain procedure or dosage.

Blanchard et al. suggested in their comprehensive analysis that mobilization have a stronger benefit than physical therapy when used within the first 6 weeks of treatment, albeit these differences faded over time. They found that mobilization had a substantial effect on pain, external rotation ROM, and impairment after 6 weeks, but only minor effects after 12 weeks (Trampas & Kitsios, 2006). Physical therapy is frequently used in conjunction with distension arthrography. In fact, when paired with a mobilization, therapeutic exercise, such as physical therapy, is more effective (Lin et al., 2009). Greater strength increases and improvements in patient-rated outcomes may necessitate longer periods of neck exercise training (DC, DC and Carroll, 2000) As a result, the effectiveness of spinal manipulation and exercise for chronic neck pain is still debated. Also unknown is the effect of combining both medications, which is a typical therapeutic practice.

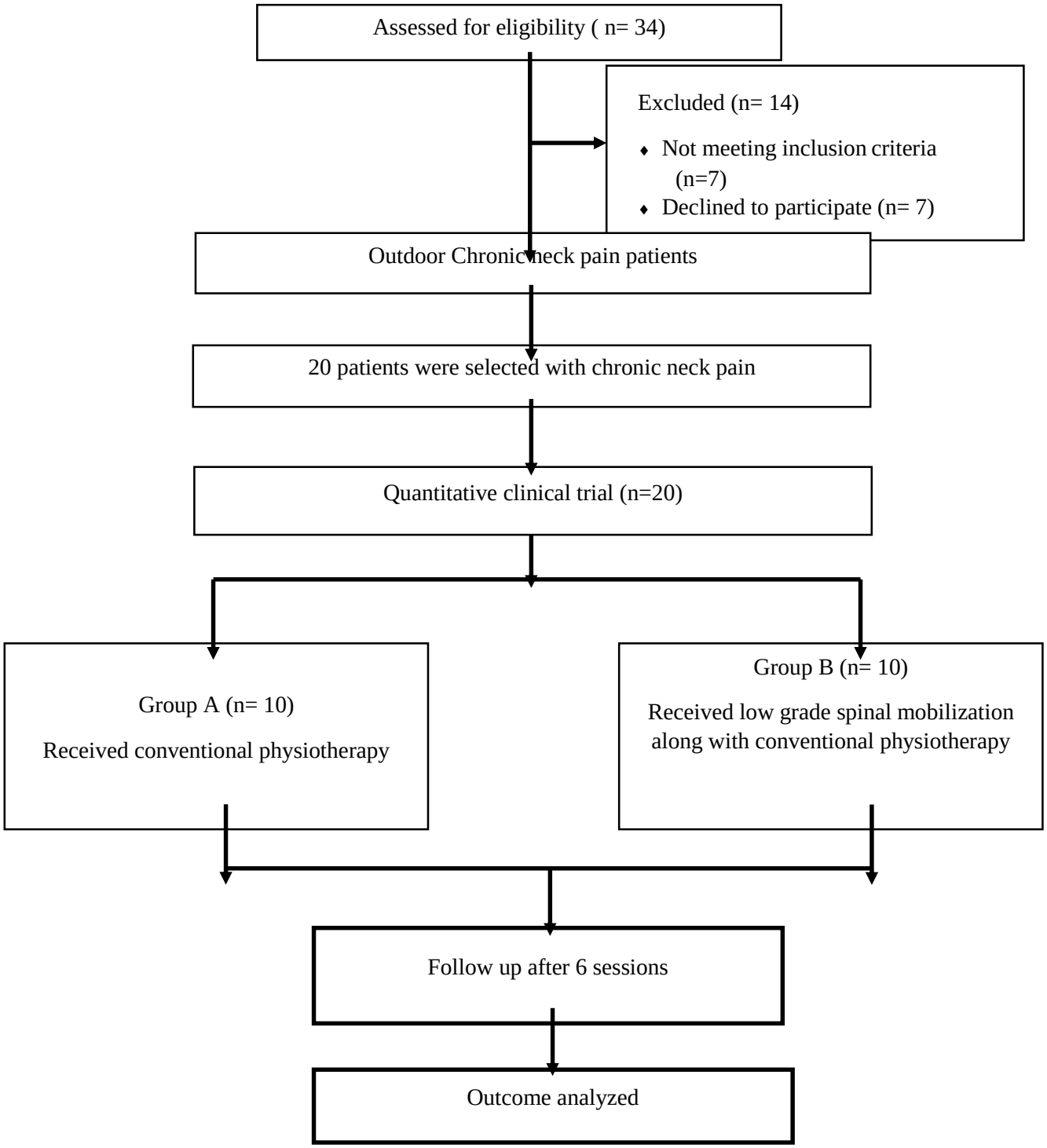
CHAPTER – III METHODOLOGY

This research was a randomized clinical trial (RCT) design to evaluate the effectiveness of low grade spinal mobilization for the patient with chronic neck pain. To identify the effectiveness of this treatment regime, Numeric Pain Rating Scale (NPRS) and Neck Pain Disability Index were used as measurement tools for measuring the pain intensity and disability caused by chronic neck pain. All patients signed an informed consent form prior to their inclusion into the study.

3.1 Study design:

The study was conducted by using a quantitative randomized control trail design with two different subject groups. The researcher chose clinical trial of this quantitative research. This study design fulfilled the aim and objectives of the research. The study was true experimental between different subject designs. Both groups will receive a common treatment regimen except one intervention. Only the experimental group will receive low grade mobilization while in control group only conventional physiotherapy treatment program will be given. A pre-test (before exercise) and post-test (after exercise) was administered with each subject of both groups to compare the pain effects, and functional ability before and after the treatment. The design could be shown by flowchart –

Flowchart of the phases of Quantitative Clinical Trial



A flowchart for a quantitative clinical trial of a treatment program including conventional physiotherapy versus low grade spinal mobilization along with conventional physiotherapy for the patients with chronic neck pain.

3.2 Study area:

The study area was Musculoskeletal Outpatient Unit of Physiotherapy Department of Centre for the Rehabilitation of the Paralyzed (CRP), Savar, Dhaka.

3.3 Study population:

The study population was the patients diagnosed with chronic neck pain in the Muscular-skeletal Unit of Physiotherapy Department at CRP, Savar, Dhaka. The study population must fulfill the inclusion criteria of the study.

3.4 Inclusion criteria

- Patient who is diagnosed by chronic neck pain. Because this research is based on only the patient with chronic neck pain. (Freeman et al., 2006)
- Patients with all age range. (Manchikanti, 2008)
- Both genders. (Freeman et al., 2006)
- Patients who want to participate willingly.
- Participants with having central neck pain and radiating pain to the limb. (Aquino et al., 2009)
- Any neck pain patients with dysfunction**.** (Aquino et al., 2009**)**

3.5 Exclusion criteria

Exclusion criteria was set up according to the guideline of chronic neck pain by (Kanlayanaphotporn, Chiradejnant and Vachalathiti, 2009)

- The participants had any experienced of recent trauma. (Farooq et al., 2018)
- Any Contraindication are found- (Misailidou et al., 2010)
    - ✓ Vertebral malignancy
    - ✓ Bone infections
    - ✓ Fracture
    - ✓ Joint irritability
    - ✓ Pregnancy
    - ✓ Hypertension
    - ✓ Spinal tumors
- Structural abnormality or any deformity. (Misailidou et al., 2010)
- Surgery to the neck or thoracic spine. (Misailidou et al., 2010)

3.6 Sample size:

In this study, 20 participants were selected according to inclusion and exclusion criteria. 10 participants will in group A and 10 participants will in group B.

3.7 Sampling technique:

Hospital based randomized sampling technique was used in this study. Subjects, who met the inclusion criteria, was taken as sample in this study. 20 patients with chronic neck pain was selected from outpatient musculoskeletal unit of physiotherapy department of CRP, Savar and then 10 patients were assigned to group A for the treatment approached of only conventional

physiotherapy and 10 patients to the group B for the treatment approached of low grade spinal mobilization along with conventional physiotherapy treatment.

3.8 Methods of data collection:

The data collection procedure was carried away by an examiner who had no connection with this research. This procedure conducted through assessing the patient based on inclusion and exclusion criteria, pretest data collection, 6 treatment sessions and final post test data collection.

After screening the patient at department and the patients were assessed and treated by the qualified physiotherapist. twenty participants were chosen based on the inclusion criteria and they were given 6 sessions of treatments individually conventional physiotherapy (10) for the group A and low grade spinal mobilization (10) for the group B. Group A Received only conventional physiotherapy and Group B received low grade spinal mobilization along with conventional physiotherapy.

A pilot study was carried out prior to the main data collection procedure to determine the responsiveness and side effect of the exercise as it is applied to the chronic neck pain patients.

Data was gathered through a selection and intervention procedure and by using a written questionnaire form which was formatted and prepared by the researcher under the supervision of the supervisor which also included the Numeric Pain Rating Scale (NPRS) to measure the general pain intensity level and Neck Disability Index (NDI) to measure pain and disability. Treatment procedure was performed in 6 sessions and gathered data before and after the treatment. The researcher gave vague instruction to the data collector how to proceed with the questionnaire and the scales used in that. A Bangla questionnaire of the Neck Disability Index (NDI) was used as the participants are native Bangla speaker and the Bangla translation was used with the permission from the developers of the questionnaire. The data collector collected the data from all group in presence of the qualified physiotherapist to reduce the biasness. The patient was totally blind about the procedure and the researcher had no connection with the data collection procedure. The data collector only gave the participants filled up questionnaires. At the end of the trail, specific tests were performed for statistical analysis.

3.9 Data collection tools:

In this study, a written questionnaire, pen, paper and a Numeric Pain Rating Scale and the Neck Disability Index (NDI) were used as a data collection tools.

3.10 Questionnaire:

The questionnaire for this study was carefully developed under the constant observations, advice and permission of the supervisor following certain guidelines. There were close ended questions with Numeric Pain Rating Scale (NPRS) and the Neck Disability Index (NDI) with some objective questions which were measured by the examiner and each question was formulated to compare the effect of the conventional physiotherapy and low grade spinal mobilization along with the conventional physiotherapy for the treatment of chronic neck pain.

3.11 Measurement tools:

3.11.1 Numeric pain rating scale (NPRS)

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 the individual's pain (Rodriguez, 2001).

According to McCaffery et al. (1989) and later on Stevens, Lin, and Maher, (2016) the Numeric Pain Rating Scale (NPRS -11) is an 11-point scale for the patient self-reporting of pain. It is for adults and children 10 years old or older. Where 0 is the smallest value and 10 is the largest value. 0 means there is no pain, 1-3 indicates there is mild pain, 4-6 indicates there is moderate pain and 7-10 indicates severe pain level.

3.11.2 Neck Disability Index (NDI)

The NDI is the most widely used neck pain scale in the largest number of populations and has been validated most often against multiple measurements of function, pain, and clinical signs and

symptoms. the Neck Disability Index (NDI) was the first instrument designed to assess self-rated disability in patients with neck pain. This article reviews the history of the NDI and the current state of the research into its psychometric properties—reliability, validity, and responsiveness—as well as its translations. Focused reviews are presented into its use in studies of the prognosis of whiplash-injured patients as well as its use in clinical trials of conservative therapies for neck pain. (Chan Ci En, Clair and Edmondston, 2009)

The NDI is the most widely used and most strongly validated instrument for assessing self-rated disability in patients with neck pain. It has been used effectively in both clinical and research settings in the treatment of this very common problem. (NIKANDER et al., 2006)

The current report's search technique for articles using or referring to the NDI was based on a citation search of the 1991 publication via the Scholar's Portal Web of Science, using Science Citation Index.

From 1991 through December 2007, articles were retrieved.

The NDI was utilized in measuring the self-rating of disability by patients with neck discomfort, thus the articles were checked to be sure. There were 287 qualifying citations as a result.

The following categories were assigned to the articles: psychometric studies, diagnosis, prognosis, treatment designs (clinical trials, case series, and case studies), treatment type (surgical, conservative, injections), patients with whiplash, patients with chronic pain, translation studies, and systematic reviews/practice guidelines.

By doing quality reviews, various subsets of publications on certain topics have been methodically reviewed.

3.12 Intervention

A common intervention program was executed for both groups as conventional physiotherapy, it includes- Soft tissue release technique, Manual cervical traction, Traction with rotation, Isometric strengthening exercise, stretching exercise, Retraction, Retraction with over pressure, Retraction extension, Ice, TENS, IRR which are the most frequently, used interventions.

Control group: In this group only conventional physiotherapy was given to the patient for three times a week with the recommended exercises for 2 weeks.

Experimental group: In this group low grade spinal mobilization was given along with conventional physiotherapy to the patient for three times a week with the recommended exercises for 2 weeks

The treatment was given by the clinical physiotherapists of musculoskeletal unit of CRP, Savar. Patients were advised to follow the instructions.

3.13 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.

3.14 Ethical consideration

The whole process of this research project was done by following the Bangladesh Medical Research Council (BMRC) guidelines, Institution Review Board (IRB) and World Health Organization (WHO) Research guidelines. The proposal of the dissertation including methodology was approved by Institutional Review Board and obtained permission from the concerned authority of ethical committee of Bangladesh Health Professions Institute (BHPI). Again before the beginning of the data collection, the researcher obtained the permission ensuring the safety of the participants from the concerned authorities of the clinical setting and was allotted with a witness from the authority for the verification of the collected data. The researcher strictly maintained the confidentiality regarding participant's condition and treatment.

3.15 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 conventional physiotherapy and low grade mobilization group score their pain intensity on numeric pain rating scale before starting treatment and after completing treatment. Reduction of pain intensity for both groups and improvement of ROM of different movements of neck are the differences between pre-test and post-test score. Experimental studies with the different subject design where two groups are used and each tested in two different conditions which should be analyzed with non-parametric "Man Whitney U" test and parametric Independent 't' test. Where the significant level of conventional physiotherapy and Low grade spinal mobilization group was found out by using "Wilcoxon" test and Paired 't' test. To test the hypothesis both test is done on SPSS version 22.

3.16 Statistical analysis

3.16.1 Mann Whitney U test

Mann-Whitney U test is a non-parametric test that is simply compares the result obtained from each group to see if they differ significantly.

Assumption

- All the observations from both groups are independent of each other.
- The responses are ordinal
- Under the null hypothesis Ho, the distribution of both populations are equal.
- The test was done for between groups.

The formula of Mann-Whitney U test:

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

Where,

n_1=The number of subjects in experimental group

n_2=The number of subjects in control group

T_x= The larger rank total

n_x= The number of subjects in the group with large rank total

U= ?

Level of Significant

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.

In this way Mann Whitney U test is done for all the variables in NPRS.

3.16.2 Wilcoxon Signed Rank Test

Experimental studies with the different subject design within one subject groups and the data is non-parametric and numerical data, which should be analyzed with "Wilcoxon Signed Rank Test:" As it was quasi-experimental and had within groups of different subjects, who were selected to eccentric strengthening exercise of hamstring muscles and concentric strengthening exercise of hamstring muscles and the measurement of the outcome came from collecting Numeric pain rating score, with considering numerical data, so the "Wilcoxon Signed Rank Test" was used in this study to calculate the level of significance. "Wilcoxon Signed Rank Test:" was calculated to test the hypothesis based on following assumptions-

- Data were numerical.
- Data were not well distributed
- Within-group comparison among subjects.

Wilcoxon sign test denoted by Z test, after the conclusion of the observed value and p-value whenever it is less than the table value of significance 0.05 level then null hypothesis was considered as rejected and alternative hypothesis considered as accepted.

$$\mathbf{Z} = \frac{\mathbf{W_s} - \frac{\mathbf{n(n+1)}}{\mathbf{4}}}{\sqrt{\frac{\mathbf{n(n-1)(2n+1)}}{\mathbf{24}}}}$$

Here, $\mathbf{W_s}$ = Smallest of absolute values of the sum

n = Total number of samples

In this way Wilcoxon test is done for all the variables in NPRS in conventional physiotherapy and low grade spinal mobilization.

3.16.3 Independent Sample T-Test

Independent sample 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 statistic t is follows:

$$t = \frac{\bar{x}1 - \bar{x}2}{s\sqrt{\frac{1}{n1} + \frac{1}{n2}}}$$

$\bar{x}1$ = Mean of the Experimental Group,
$\bar{x}2$ = Mean of the Control Group,
$n1$ = Number of participants in the Experimental Group,
$n2$ = Number of participants in the Control Group
S = Combined standard deviation of both groups

In this way researcher had calculated independent t-value and significant level.

3.16.4 Paired t test

Paired t-test was used to compare difference between means of paired variables.

Selection of test of hypothesis is mean difference under t distribution.

Assumption

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

Formula test statistic t is follows:

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

Where,

$\bar{d}$ = mean of difference (d) between paired values
SE ($\bar{d}$)= Standard Error of the mean difference
SD = standard deviation of the differences *d* and
n= number of paired observations

In this way researcher had calculated paired t-value and significant level.

CHAPTER – IV RESULTS

4.1 Socio-demographic Information

	Control group		Experimental group	
Variable	**frequency**	**Values**	**frequency**	**values**
Age				
24-33	4	40%	3	30%
34-43	2	20%	2	20%
44-<53	4	40%	5	50%
Sex				
male	7	70%	9	90%
female	3	30%	1	10%
Marital Status				
Married	9	90%	9	90%
Unmarried	1	10%	1	10%
Educational qualifications				
Primary	-	-	1	10
Secondary	3	30%	4	40%
Higher secondary	4	40%	1	10%
Graduation	1	10%	2	2%
Post-graduation	2	20%	2	2%
Occupation				
Farmer and laborer	1	10%	2	20%
Service holder	3	30%	3	30%
House wife	3	30%	1	10%

Business	1	10%	2	20%
Retired	1	10%	1	10%
Student	1	10%	1	10%
Living area				
Rural	3	30%	5	50%
Semi-rural	2	20%	2	20%
Urban	5	50%	3	30%
Family size				
Nuclear family	6	60%	9	90%
Combined family	4	40%	1	10%
Types of pain				
Acute Pain	-	-	-	-
Subacute Pain	-	-	-	-
Chronic pain	10	100%	10	100%
Radiating pain				
None	2	20%	-	-
Unilateral	7	70%	9	90%
Bilateral	1	10%	1	10%
Radiating pain above elbow/arm region				
None	2	20%	-	-
Unilateral	7	70%	9	90%
Bilateral	1	10%	1	10%
Radiating pain bellow elbow/forearm region				
None	5	50%	2	20%
Unilateral	4	40%	7	70%
Bilateral	1	10%	1	10%

MRI report finding				
Disc protrusion	3	30%	6	60%
Disc Herniation	2	20%	2	20%
Disc Bulging	5	50%	2	20%
Sequestration	-	-	-	-
X-Ray report finding				
Increase lordosis	1	10%	-	-
Decrease lordosis	1	10%	-	-
Flat cervical spine -	-	-	-	-
Disc space reduce	-	-	-	-
Degenerative changes	2	20%	1	10%
Normal study	-	-	2	20%
1+5	3	30%	1	10%
4+5	1	10	-	-
1+4	1	10%	1	10%
2+3	1	10%	3	30%
2+4+5	-	-	2	20%

Age: Among the respondents the minimum age was 24 years and maximum age was 53 years. From 24-33 years there was 4 respondents (40%), 34-43 years there was 2 respondents (20%), 44-<53 years there was 4 respondents (40%) in control group and on the other hand in experimental group 24-33 years there was 3 respondents (30%), 34-43 years there was 2 respondents (20%), 44-<53 years there was 5 respondents (50%).

Sex: In this study 7 males and 3 females were included and the percentage of male and female were 70% and 30% in control group on the other hand in experimental group 9 males and 1 female were included and the percentage of male and female were 90% and 10%.

Marital Status: Among the participants90% (n= 9) were married and 1% (n=1) were unmarried in both control group and experimental group.

Educational Qualifications Among the participants of the study 30% (n=3) were Secondary, 40% (n=4) were Higher secondary, 10% (n=1) were Graduation and 20% (n=2) were Post-graduate participant in control group on the other hand in experimental group 10% (n=1) were primary, 40% (n=4) were Secondary, 10% (n=1) were Higher secondary, 20% (n=1) were Graduation and 20% (n=2) were Post-graduate participant.

Occupation: Among the 20 participants, 10% (n=1) were Farmers and laborer, 30% (n=3) were Service holder, 10% (n=1) were Businessmen 10% (n=1) were Retired, 10% (n=1) were Students, and 30% (n=3) were House wife in control group and 20% (n=2) were Farmers and laborer, 30% (n=3) were Service holder, 20% (n=2) were Businessmen 10% (n=1) were Retired, 10% (n=1) were Students, and 10% (n=1) were House wife in experimental group.

Living area: Among the 20 participants, 30% (n=3) were in Rural area, 20% (n=2) were in Semirural area, and 50% (n=5) were in Urban area in control group and, 50% (n=5) were in Rural area, 20% (n=2) were in Semirural area, and 30% (n=3) in experimental group.

Family size Among the 20 participants, 60% (n=6) were nuclear family and 40% (n=4) were combined family in control group and in experimental group, 90% (n=9) were nuclear family and 10% (n=1) were combined family.

Types of pain: Among the participants of the study 100% had chronic neck pain in both group.

Radiating pain: Among the 20 participants, 20% (n=2) had no radiating pain, 70% (n=7) had radiating unilateral pain and 10% (n=1) had radiating bilateral pain in control group and 90% (n=9) had radiating unilateral pain and 10% (n=1) had radiating bilateral pain in experimental group.

Radiating pain above elbow arm region: Among the participants of the study 20% (n=2) had no radiating pain above elbow arm region, 70% (n=7) had radiating unilateral pain above elbow arm region and 10% (n=1) had radiating bilateral pain above elbow arm region in control group, on the contrary in experimental group ,90% (n=9) had radiating unilateral pain above elbow arm region and 10% (n=1) had radiating bilateral pain above elbow arm region.

Radiating pain bellow elbow forearm region: Among the 20 participants, 50% (n=5) had no radiating pain below elbow forearm region, 40% (n=4) had radiating unilateral pain below elbow forearm region and 10% (n=1) had radiating bilateral pain below elbow forearm region in control group and in experimental group 20% (n=2) had no radiating pain below elbow forearm region, 70% (n=7) had radiating unilateral pain below elbow forearm region and 10% (n=1) had radiating bilateral pain below elbow forearm region.

MRI report finding: Among the participants, 30% (n=3) had Disc Protrusion, 20% (n=2) had Disc Herniation, 50% (n=5) had Disk Bulging in control group and on the contrary 60% (n=6) had Disc Protrusion, 20% (n=2) had Disc Herniation, 20% (n=2) had Disk Bulging in experimental group.

X-ray report finding: Among the 20 participants, 10 %(n=1) had Increase lordosis, 10% (n=1) had Decrease lordosis, 20% (n=2) had Degenerative change, 30% (n=3) had (1+5), 10% (n=1) had (4+5), 10% (n=1) had (1+4) and 10 % (n=1) had (2+3) in X-ray report findings on the other hand in experimental group 10% (n=1) had Degenerative change, 20 % (n=2) had normal study, 10% (n=1) had (1+5), 20% (n=2) had (2+4+5), 10% (n=1) had (1+4) and 30 % (n=3) had (2+3) in X-ray report findings.

Table 2: Mann Whitney U test

NPRS	Mann Whitney U value	P value	Significance
Pain intensity Cervical region according to the Numeric Pain Rating Scale	24.000	.015	Significant
Pain intensity arm/above elbow region according to the Numeric Pain Rating Scale	36.000	.224	Insignificant
Pain intensity forearm/below elbow region according to the Numeric Pain Rating Scale	48.500	.904	Insignificant
Pain intensity during lying position according to the Numeric Pain Rating Scale	25.000	.024	Significant
Pain intensity during sitting in chair according to the Numeric Pain Rating Scale	25.000	.024	Significant
Pain intensity during turning neck according to the Numeric Pain Rating Scale	4.500	.000	Significant
Pain intensity during walking according to the Numeric Pain Rating Scale	10.000	.000	Significant
Pain intensity during sleeping according to the Numeric Pain Rating Scale	15.000	.001	Significant

Pain intensity during lifting object according to the Numeric Pain Rating Scale	15.000	.001	Significant
Pain intensity during working according to the Numeric Pain Rating Scale	5.000	.000	Significant
Pain intensity during driving according to the Numeric Pain Rating Scale	49.000	.914	Insignificant

Level of Significance (<0.05)

4.2.1 Mann Whitney U test analysis of post- test NPRS pain condition among the participants (Between Group Analysis, Table-2).

Here Man Whitney U test is done to find out the significant level between two groups Control group and Experimental group of Numeric Pain Rating Scale (NPRS) followed by physiotherapy intervention.

The Man Whitney U test have a significant result according to statistical test revealing changes in Pain Intensity Cervical region (P= 0. 015) and U value (U=24.000), Pain intensity during lying position (P= .024) and U value (U=25.000), Pain intensity during sitting in chair (P= .024) and U value (U=25.000), Pain intensity during turning neck (P= .000) and U value (U=4.500), Pain intensity during walking (P= .000) and U value (U=10.000), Pain intensity during sleeping (P= .001) and U value (U=15.000), Pain intensity during lifting object (P=.001) and U value (U=15.000) , Pain intensity during working (P=.000) and U value (U= 5.000) all of this is significant (<0.05).

For this result as the maximum calculated P value is less than the table P value. So here alternative hypothesis is accepted and null hypothesis is rejected.

Table 3: Wilcoxon z test

Conventional physiotherapy				Low grade spinal mobilization		
NPRS	**Wilcoxon z test**	**P value**	**Significance**	**Wilcoxon z test**	**P value**	**Significance**
Pain intensity Cervical region according to the Numeric Pain Rating Scale	-3.162	.002	Significant	-2.889	.004	Significant
Pain intensity arm/above elbow region according to the Numeric Pain Rating Scale	-2.828	.005	Significant	-2.889	.004	Significant
Pain intensity forearm/below elbow region according to the Numeric Pain Rating Scale	-1.633	.102	Insignificant	-2.640	.008	Significant

Pain intensity during lying position according to the Numeric Pain Rating Scale	-2.762	.006	Significant	-2.919	.004	Significant
Pain intensity during sitting in chair according to the Numeric Pain Rating Scale	-2.810	.005	Significant	-3.051	.002	Significant
Pain intensity during turning neck according to the Numeric Pain Rating Scale	-2.828	.005	Significant	-2.889	.004	Significant
Pain intensity during walking according to the Numeric Pain Rating Scale	-2.714	.007	Significant	-2.972	.003	Significant
Pain intensity during sleeping according to the Numeric Pain Rating Scale	-2.828	.005	Significant	-3.051	.002	Significant
Pain intensity during lifting	-2.828	.005	Significant	-2.919	.004	Significant

object according to the Numeric Pain Rating Scale						
Pain intensity during working according to the Numeric Pain Rating Scale	-3.000	.003	Significant	-1.941	.052	Significant
Pain intensity during driving according to the Numeric Pain Rating Scale	.000	1.000	Insignificant	-2.911	.004	Significant

Level of Significance (<0.05)

4.3.1 Wilcoxon test for changes in NPRS in Conventional physiotherapy (Table-3):

Wilcoxon test has been determined to measure the changes in NPRS between pretest and post test of Conventional physiotherapy group followed by physiotherapy intervention.

The Wilcoxon test have a significant result according to statistical test revealing changes between pretest and posttest of Conventional physiotherapy group in Pain intensity Cervical region (Z= -3.162, P=.002), Pain intensity arm/above elbow region (Z= -2.828, P=.005), Pain intensity during lying position (Z=-2.762, P=.006), Pain intensity during sitting in chair (Z= -2.810, P=.005), Pain intensity during turning neck (Z= -2.828, P=.005), Pain intensity during walking (Z= -2.714, P=.007), Pain intensity during sleeping (Z= -2.828, P=.005), Pain intensity during lifting object (Z= -2.828, P=.005), Pain intensity during working (Z= -3.000, P=.003), all of this variables are significant (<0.05). So here alternative hypothesis is selected and null hypothesis is rejected. It can be said that conventional physiotherapy is effective to reduce pain for the patient with Chronic neck pain.

4.3.2 Wilcoxon test for changes in NPRS in Low grade mobilization (Table-3):

Wilcoxon test has been determined to measure the changes in NPRS between pretest and post test of Low grade mobilization group followed by physiotherapy intervention.

The Wilcoxon test have a significant result according to statistical test revealing changes between pretest and post test of Low grade mobilization group in Pain intensity Cervical region (Z= -2.889, P=.004), Pain intensity arm/above elbow region (Z= -2.889, P=.004), Pain intensity during lying position (Z= -2.919, P=.004), Pain intensity during sitting in chair (Z= -3.051, P=.002), Pain intensity during turning neck (Z= -2.889, P=.004), Pain intensity during walking (Z= -2.972, P=.003), Pain intensity during sleeping (Z= -3.051, P=.002), Pain intensity during lifting object (Z= --2.919, P=.004), Pain intensity during working (Z= -1.941, P=.052), Pain intensity during driving (Z=-2.911, P=.004), all of this variables are significant(<0.05). So here alternative hypothesis is selected and null hypothesis is rejected. It can be said that low grade mobilization is effective to reduce pain for the patient with Chronic neck pain.

Table 4: Independent sample t-test

Researcher has calculated the value of pain and disability of **NPDI** questionnaire through independent sample-t test in between Conventional group and low grade spinal mobilization group in the following table:

Variable	Mean Difference	95% confidence interval of the Difference		F	P value	Significance
		Lower	Upper			
Pain Intensity	1.300	.830	1.770	.066	.000	Significant
Personal Care	1.500	.902	2.098	9.566	.000	Significant
Lifting	1.600	1.058	2.142	.000	.000	Significant
Reading	1.500	.990	2.010	.762	.000	Significant
Headaches	1.200	.414	1.986	7.579	.005	Significant
Concentration	1.400	.798	2.002	.073	.000	Significant
Work	1.400	.992	1.808	16.000	.000	Significant
Driving	.300	-1.031	1.631	1.557	.641	Insignificant
Sleeping	.400	-.226	1.026	.225	.196	Insignificant
Recreation	1.300	.753	1.847	.013	.000	Significant

Level of Significance (<0.05)

4.4.1 Independent sample t-test analysis of post-test ROM among the participants (Between Group Analysis, Table-4).

Here independent sample t-test is done to find out the significant level between two groups conventional group and low grade spinal mobilization group of **NPDI** followed by physiotherapy intervention.

The independent sample t-test have a significant result according to statistical test revealing changes between conventional group and low grade spinal mobilization group in Pain Intensity (t= 5.814, P= .000), Personal Care (t= 5.267, P= .000), Lifting (t= 6.197, P= .000), Reading (t= 6.181, P= .000), Headaches (t= 3.207, P= .000), Concentration (t= 4.882, P= .000), Work (t= 7.203, P= .000), Recreation (t= 4.993, P= .000); all of this variables are significance (<0.05).

For this result as the maximum variables are significant so here alternative hypothesis is accepted and null hypothesis is rejected.

Table 5: Paired t-test

Researcher has calculated the value of pain and disability of **NPDI** questionnaire through pair-t test in between pre and post values of conventional physiotherapy and low grade spinal mobilization group in the following table:

	Control group					**Experimental group**				
Variable	**t**	**95% Confidence Interval of the Difference**		**P value**	**Significance**	**t**	**95% Confidence Interval of the Difference**		**P value**	**Significance**
		lower	**upper**				**lower**	**upper**		
Pain Intensity	9.487	1.523	2.477	.000	Significant	15.377	2.900	3.900	.000	Significant
Personal Care	9.000	1.348	2.252	.000	Significant	14.000	2.348	3.252	.000	Significant
Lifting	7.236	1.100	2.100	.000	Significant	12.750	2.797	4.003	.000	Significant
Reading	6.042	1.189	2.611	.000	Significant	11.196	2.474	3.726	.000	Significant
Headaches	3.354	.326	1.674	.008	Insignificant	6.228	1.592	3.408	.000	Significant
Concentration	9.487	1.523	2.477	.000	Significant	20.821	3.031	3.769	.000	Significant
Work	9.487	1.523	2.477	.000	Significant	15.652	2.994	4.006	.000	Significant
Driving	1.500	-.102	.502	.168	Insignificant	1.464	-.273	1.273	.177	Insignificant
Sleeping	5.582	.892	2.108	.000	Significant	8.060	1.942	3.458	.000	Significant
Recreation	9.000	1.572	2.628	.000	Significant	21.604	2.954	3.646	.000	Significant

Level of Significance (<0.05)

4.5.1 Paired ‘t’ test for measuring pain and disability of NPDI in Control group (Table-5):

Paired ‘t’ test has been determined to measure the changes in pain and disability of **NPDI** between pretest and post test of conventional physiotherapy group followed by physiotherapy intervention.

Paired ‘t’ test have a significant result according to statistical test revealing changes between pretest and post test of conventional physiotherapy group in Pain Intensity (t= 9.487, P= .000), Personal Care (t= 9.000, P= .000), Lifting (t= 12.750, P= .000), Reading (t= 11.196, P= .000), Headaches (t= 3.354, P= .008), Concentration (t= 9.487, P= .000), Work (t= 9.487, P= .000), Sleeping (t= 5.582, P= .000), Recreation (t= 9.000, P= .000); all of this variables are significant (<0.05). So here alternative hypothesis is selected and null hypothesis is rejected. It can be said that conventional physiotherapy is effective for reducing pain and disability for the patient with Chronic neck pain.

4.5.2 Paired ‘t’ test for measuring pain and disability of NPDI in Experimental group (Table-5):

Paired ‘t’ test has been determined to measure the changes in pain and disability of **NPDI** between pretest and post test of low grade spinal mobilization group followed by physiotherapy intervention.

Paired ‘t’ test have a significant result according to statistical test revealing changes between pretest and post test of low grade spinal mobilization group in Pain Intensity (t= 15.377, P= .000), Personal Care (t= 14.000, P= .000), Lifting (t= 7.236, P= .000), Reading (t= 6.042, P= .000), Headaches (t= 6.228, P= .008), Concentration (t= 20.821, P= .000), Work (t= 15.652, P= .000), Sleeping (t= 8.060, P= .000), Recreation (t= 21.604, P= .000); all of this variables are significant (<0.05). So here alternative hypothesis is selected and null hypothesis is rejected. It can be said that low grade spinal mobilization is effective for reducing pain and disability for the patient with Chronic neck pain.

CHAPTER – V DISCUSSION

The researcher was devoted to find out the effectiveness of Low grade spinal mobilization for the patient with Chronic neck pain. The different measurement tools were used to examine the hypothesis and test the hypothesis whether the null hypothesis were accepted or not based on the smaller or larger p. Self-oriented questionnaire was used to find out the socio-demographical indicators. Significant improvements occurred in most of the measures that were recorded before and after treatment. The result found that the mean age was (44- <53) years. Among all of the participants 80% was male and 20% was 30% were service holder, ,15% were businessman, 10% were student, 20.0% were housewife. In this study 90.0% patients were married and other 10.0% were unmarried. 75.0% were from the nuclear family and 25.0% were from combined family. 40% among of all the patients were from rural area,20% were from semi-rural area and 40% were from urban area. Among all the patients,5 % were primary level, 35% were secondary level, , 25% were H.S.C passed, 15% were graduate, 20% were post graduate. The mean monthly family income was BDT 27642. In this experimental study 20 patients with Chronic neck pain were randomly assigned to the Control group and to the Experimental group. Among these 20 patients, 10 patients were included in the Control group who received only conventional physiotherapy and the rest of the 10 patients were included in the Experimental group, who received Low grade spinal mobilization with conventional physiotherapy. Each group attended for 6 sessions of treatment within two 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, and NPDI for measuring Pain, ROM and Disability. Man Whitney U test and Unpaired 't'test was done to compare the effectiveness between two groups Control and Experimental on the other hand Wilcoxon test and Paired 't' test was done to find out the effectiveness in pre and posttest in within group. In this study in Wilcoxon statistics Conventional physiotherapy found very effective to decrease pain in NPRS in Control group and Low grade spinal mobilization also found effective to decrease pain in NPRS in Experimental group following the significance level (P=<0.05). But in the Man Whitney U Statistics Low grade spinal mobilization with conventional physiotherapy found more effective (as most of the calculated U value were less than the table U value) than Only conventional physiotherapy to decrease pain in NPRS following the significance level (P=<0.05). To

determination the pain and disability of NPDI in Paired ‘t’ statistics Conventional physiotherapy and Low grade mobilization found effective to decrease pain and disability in separate groups where the significance level was (P=<0.05). But in compares between two groups Unpaired ‘t’ statistics found Low grade spinal mobilization more effective (as all of the variables were significance) than Conventional physiotherapy, in the neck following the significance level (P=<0.05)

An evaluation of a therapeutic exercise programmer to reduce pain and enhance cervical function was held in 2014. Group I – For two weeks (five days a week, one session per day), 20 participants (f = 6; m = 14) received Maitland mobilization of the cervical spine as well as prescribed exercises. In the case of Group II– 20 participants (f = 7; m =13) received supervised exercise program consisting of flexibility and strengthening exercises for a period of five sessions per week for two weeks. The exercises prescribed were stretching exercises to cervical and scapular muscles, deep neck flexor strengthening, isometric exercises for extensors, side flexors (both sides) and rotators (both sides), anti-gravity strengthening to rhomboids, middle and lower trapeze and cervical ROM exercises. All exercises were done with a dosage of one set of 10 repetitions with 6 s hold and 10 s rest between the repetitions The Maitland technique is used to treat the patient, and it aims to determine the efficacy of an intervention by assessing the restricted segmental mobility induced by the patient's symptoms. The participants were given Maitland mobilization. Grades I and II were used when pain occurred before the motion barrier was encountered, whereas grades III and IV were used when the motion barrier was encountered. With metronome control and a frequency of 3–4 mobilizations of the joint lasting roughly 30 seconds each, this oscillatory mobilization was accomplished at a rate of 2–3 oscillations per second. Each mobilization was separated by a one-minute rest period. The findings of this study imply that supervised exercises are just as effective as unsupervised exercises. Neck mobilization and exercises combined were as beneficial in lowering neck pain, enhancing range of motion, and reducing related impairment among participants. (Ganesh, Mohanty, Pattnaik and Mishra, 2014).

In 2009 a study that compared the effectiveness of two treatment strategies that used varied levels of mobilization approaches. Control (n = 24) and experimental (n = 24) therapy groups were assigned to 48 patients. Both groups reported significant pain alleviation following therapy during the most severe active activity and spinal palpation. These data imply that, regardless of whatever cervical vertebral level is mobilized, individuals with persistent neck pain may enjoy instant pain alleviation during movement and vertebral palpation. However, the changes were minor generally, and both treatment strategies resulted in clinically meaningful improvements in the individuals. (Aquino et al., 2009).

In June 2021, another study assumed where 50 participants were taken in which the control group had 76 percent females, 64 percent of whom were over 30 years old, and the mean age was 33.48±8.59, whereas the manual mobilization treatment group had 72 percent females and 68 percent of whom were between 20 and 30 years old, and the mean age was 30.44±7.89. The average age was 33.48±8.59. The first group received treatment from a physiotherapist, which included stretching exercises and other physiotherapy interventions. Both groups received treatment twice weekly for three weeks, for a total of six treatment sessions. Group 2 underwent mobilization in grades I and II, as well as strengthening exercises. Every patient received a 10-minute therapy intervention for mobilization of the hypo mobile segments, as determined by the evaluation prior to the treatment regime. In the prone posture, mobilization was administered. The spinal segments that were most provocative of 30-second oscillations were given posterior–anterior mobilization for three bouts. IBM SPSS version 23.0 was used to investigate the data. For baseline characteristics of examined variables, counts with percentages were presented between two treatment groups. Manual Mobilization and traditional physiotherapy The post-treatment outcomes of Stretching Exercise and Manual Mobilization were also compared using the independent sample t-test. The P-value that is considered significant is less than 0.05. In the management of NP, both groups received therapy protocols that reduced pain and impairment. Both treatments showed similar significant findings in terms of lowering pain, restoring ROM, and functioning in both groups, but manual mobilization performed somewhat better when compared to traditional physiotherapy. There were two types of outcome measurements utilized. One is the NPRS questionnaire, while the other is the NDI questionnaire. (Waheed et al., 2021).

The results of the study demonstrated that low grade spinal mobilization is slightly better for pain and disability for the patient with chronic neck pain than conventional physiotherapy. Other studies have also found that low grade spinal mobilization have greater role in increase cervical ROM and improve functionality.

Limitation of the Study:

- Among the vast numbers of chronic neck pain patients, the sample size was really very small, so the result is difficult to generalize among whole population as different people can have different lifestyles.
- Researcher took help from one assessor for data collection purpose, it may vary result and had a high chance of biasness.
- Data was collected from only one clinical setting CRP at Savar; it can be influencing the result and outcome of the results.
- Sometimes treatment sessions and exercise sessions were interrupted due to public holiday and recruit physiotherapists took leave in the data collection that may interrupt the result.
- Different participants had different capacity of exercise tolerance, but every participant took on the same exercise protocol. Exercise protocols would be better if participants were given different protocol according to their capacity.
- The mean age and gender of two groups were not same. That can affect the results.
- Clinical Physiotherapists who were providing physiotherapy treatment, they could give different treatments to different patients. That can change the result.
- There was no available research done in this area in Bangladesh. So, relevant information about chronic neck pain patient with specific intervention for Bangladesh was very limited in this study.

CHAPTER – VI CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The result of this study has shown that the effectiveness of low grade spinal mobilization along with conventional physiotherapy for the patients with chronic neck pain. It was a quantitative study of clinical trial. Among 20 participants 10 participants received low grade spinal mobilization and rest 10 participants received only conventional physiotherapy. Both groups received same conventional physiotherapy at the same time. Only difference was the low grade mobilization given by the researcher and this difference brought the difference to the results. Actually, both of the groups had significant change in pain and disability among the patients in pre and post treatment periods. After posttest, group had significant change in pain perception and functionality. Then researcher compare the results between groups, both groups had a significant change in 6 points among 10 points. where the low grade mobilization had significant change over the conventional physiotherapy. The final result showed that the low grade spinal mobilization along with conventional physiotherapy is more helpful in chronic neck pain patients for pain control and reduce disabilities. This study now can help the physiotherapists to rehabilitation and prevent disabilities by chronic neck pain even more.

6.2 Recommendation

As a consequence of this research, it is recommended to do further study including only low grade spinal mobilization and only conventional physiotherapy for chronic neck pain alone to assess the effectiveness of these interventions with well blinding procedure. 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.

It is also recommended to do further study on this topic with much larger population.

The researcher did not have enough environment and enough equipment to complete the research. That’s why researcher recommended to do further study with enough time and by maintaining available equipment to make the study more valid.

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Appendix

Code: Date:

Verbal Consent Statement

(Please read out to the participants)

Assalamualaikum/Namaskar,

My name is Mahmudul Hasan, I am conducting this study as a part of my academic work of B.Sc. in Physiotherapy under Bangladesh Health Professions Institute (BHPI), which is affiliated with the University of Dhaka. My study title is **"Effectiveness of low-grade spinal mobilization for the patient with Chronic neck pain"**. I would like to know about some personal and other related information regarding Chronic neck pain. You will need to answer some questions which are mentioned in this form. It will take approximately 20-25 minutes.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. All information provided by you will keep in a locker as confidential and in the event of any report or publication, it will be ensured that the source of information remains anonymous, and also all information will be destroyed after completion of the study.

Your participation in this study is voluntary and you may withdraw yourself at any time during this study without any negative consequences. You also have the right not to answer a particular question that you don't like or do not want to answer during the interview.

If you have any queries about the study or your right as a participant, you may contact me and/or my supervisor Mohammad Anwar Hossain, Associate Professor (BHPI), Senior Consultant, Head of the department of Physiotherapy, CRP, Savar, Dhaka-1343.

Do you have any questions before I start? Yes / No

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

Yes……

No…….

Signature of the Participant _____

Address _____

Contact number _____

Signature of the Interviewer_____

কোড: তারিখঃ

মোখিক অনুমতি পত্র

(অংশগ্রহণকারী কে পড়ে শোনাতে হবে)

আসসালামুয়ালাইকুম/নমস্কার,

আমার নাম মাহমুদুল হাসান,আমি এই গবেষণা প্রকল্পটি বাংলাদেশ হেলথ প্রফেশনস ইনস্টিটিউট (বি এইচ পি আই)- যা ঢাকা বিশ্ববিদ্যালয়ের অধিভুক্ত এ পরিচালনা করছি যা আমার ৪র্থ বর্ষ বি এসসি ইন ফিজিওথেরাপী কোর্সের অধিভুক্ত। আমার গবেষণার শিরোনাম হল-**দীর্ঘস্থায়ী ঘাড়ে ব্যথা রোগীর জন্য লো গ্রেড মোবিলাইজেশন এর কার্যকারিতা।** আমি এক্ষেত্রে আপনাকে কিছু ব্যক্তিগত এবং অনুষঙ্গিক প্রশ্ন করতে চাচ্ছি। যা এই ফর্মে উল্লেখ করা হয়েছে।এটি আনুমানিক ২০-২৫ মিনিট সময় নেবে।আমি আপনাকে অনুগত করতে চাই যে এটি একটি সম্পূর্ণরূপে একাডেমিক অধ্যয়ন এবং অন্য কোন উদ্দেশ্যে ব্যবহার করা হবে না। আপনার দ্বারা প্রদত্ত সমস্ত তথ্যের গোপনীয়তা বজায় রাখা হবে এবং কোনও প্রতিবেদন বা প্রকাশের ক্ষেত্রে, এটি নিশ্চিত করা হবে যে তথ্যের উৎসটি অপ্রকাশিত থাকবে এবং অধ্যয়ন শেষ হওয়ার পরে সমস্ত তথ্য বিলীন করা হবে।

এই অধ্যয়নে আপনার অংশগ্রহণ স্বেচ্ছা প্রণোদিত এবং আপনি এই অধ্যয়ন চলাকালীন যেকোনো সময় কোনো নেতিবাচক পরিণতি ছাড়াই নিজেকে প্রত্যাহার করতে পারেন। এছাড়াও সাক্ষাৎকারের সময় আপনি পছন্দ করেন না বা উত্তর দিতে চান না এমন কোনো প্রশ্নের উত্তর না দেওয়ার অধিকারও আপনার রয়েছে।

এই অধ্যয়নে অংশগ্রহণকারী হিসাবে যদি আপনার কোন প্রশ্ন থাকে তাহলে, আপনি আমার সাথে যোগাযোগ করতে পারেন অথবা আমার সুপারভাইজার মোহাম্মদ আনোয়ার হোসেন, সহযোগী অধ্যাপক (বিএইচপিআই), সিনিয়র কনসালটেন্ট, ফিজিওথেরাপি বিভাগের প্রধান, সিআরপি, সাভার, ঢাকা- ১৩৪৩ উনার সাথেও যোগাযোগ করতে পারেন।

শুরু করার আগে আপনার কোন প্রশ্ন আছে? হ্যাঁ/না

তাহলে, ইন্টারভিউ বা কাজের জন্য আমি কি আপনার সম্মতি পেতে পারি?

হ্যাঁ..... না.....

অংশগ্রহণকারীর স্বাক্ষর _____

ঠিকানা _____

যোগাযোগের নম্বর _____

সাক্ষাৎগ্রহণকারীর স্বাক্ষর _____

Questionnaire (English)

PRE-TEST QUESTIONNAIRE

Title: Effectiveness of low-grade spinal mobilization for the patient with chronic neck pain.

Part 1: Socio-demographic Information

1.1 Age:

1.2 Sex:

1. Male
2. Female

1.3 Marital Status

1. Married
2. Unmarried

1.4 Educational Qualifications

1. Illiterate
2. Primary
3. Secondary
4. Higher secondary
5. Graduation
6. Post-graduation

1.5 Occupation

1. Farmers and laborer
2. Service Holder
3. House wife
4. Businessman
5. Retired
6. Student
7. Others ……..

1.6 Living area

1. Rural

2.Semirural

3.Urban

1.7 Family size

1. Nuclear Family

2. Combined Family

1.8 Family members ……

1.9 Monthly Income …**……**

Part-2: Clinical information\Pain related information

2.1 Types of pain

1. Acute Pain
2. Subacute Pain
3. Chronic pain

2.2 Radiating pain

1. None
2. Unilateral
3. Bilateral

2.3 Radiating pain above elbow/arm region

1. None
2. Unilateral
3. Bilateral

2.4 Radiating pain bellow elbow/forearm region

1. None
2. Unilateral
3. Bilateral

2.5 MRI report finding

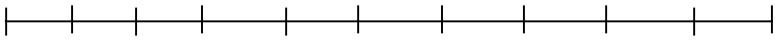
1. Disc protrusion
2. Disc Herniation
3. Disc Bulging
4. Disc Sequestration

2.5 X-Ray report finding

1. Increase lordosis
2. Decrease lordosis
3. Flat Cervical spine
4. Disc space reduce
5. Degenerative change
6. Normal study

Part-3: Pain related Question

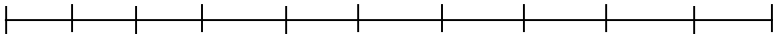
3.1 Pain intensity Cervical region according to the Numeric Pain Rating Scale



0 1 2 3 4 5 6 7 8 9 10

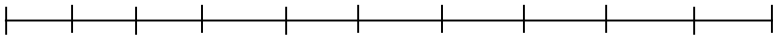
Zero (0) means no pain, five (5) means moderate pain and Ten (10) means extreme pain.

3.2 Pain intensity arm/above elbow region according to the Numeric Pain Rating Scale



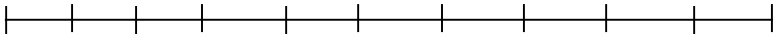
0 1 2 3 4 5 6 7 8 9 10

3.3 Pain intensity forearm/below elbow region according to the Numeric Pain Rating Scale



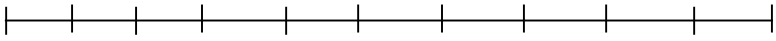
0 1 2 3 4 5 6 7 8 9 10

3.4 Pain intensity during lying position according to the Numeric Pain Rating Scale



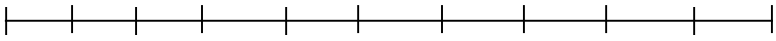
0 1 2 3 4 5 6 7 8 9 10

3.5 Pain intensity during sitting in chair according to the Numeric Pain Rating Scale



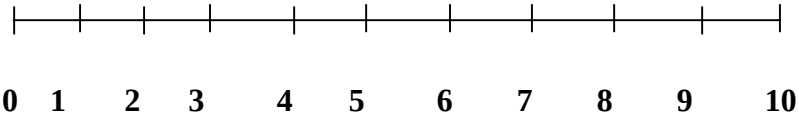
0 1 2 3 4 5 6 7 8 9 10

3.6 Pain intensity during turning neck according to the Numeric Pain Rating Scale

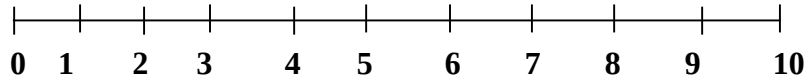


0 1 2 3 4 5 6 7 8 9 10

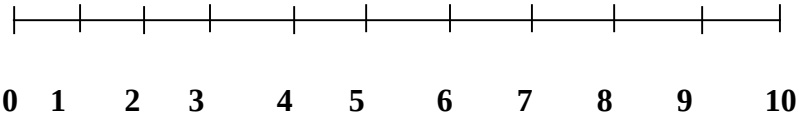
3.7 Pain intensity during walking according to the Numeric Pain Rating Scale



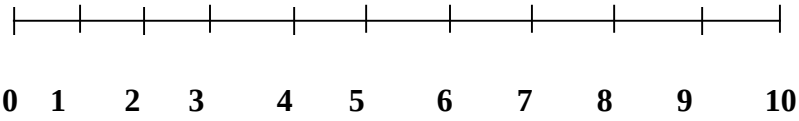
3.8 Pain intensity during sleeping according to the Numeric Pain Rating Scale



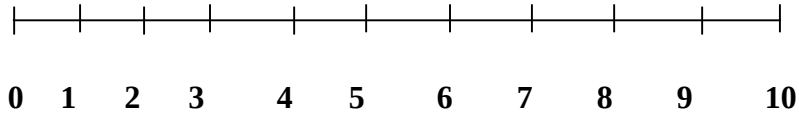
3.9 Pain intensity during lifting object according to the Numeric Pain Rating Scale



3.10 Pain intensity during working according to the Numeric Pain Rating Scale



3.11 Pain intensity during driving according to the Numeric Pain Rating Scale



Part-4: Neck pain disability index

Please read the instructions before answering.

This questionnaire is designed to give the health care provider information as to how your neck pain has affected your ability to manage in your everyday life. In each section, mark only the ONE box that applies to you. We realize that you consider that two of the statements in any one section relates to you, but just mark the one that most closely describes your problem today.

Section 1 - Pain Intensity

- o I have no pain at the moment.
- o The pain is very mild at the moment.
- o The pain is moderate at the moment.
- o The pain is fairly severe at the moment.
- o The pain is very severe at the moment.
- o The pain is the worst imaginable at the moment.

Section 2 -- Personal Care (Washing, Dressing, etc.**)**

- o I can look after myself normally without causing extra pain.
- o I can look after myself normally but it causes extra pain.
- o It is painful to look after myself and I am slow and careful.
- o I need some help but manage most of my personal care.
- o I need help every day in most aspects of self-care.
- o I do not get dressed, I wash with difficulty and stay in bed.

Section 3 – Lifting

- o I can lift heavy weights without extra pain.
- o I can lift heavy weights but it gives extra pain.
- o Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently positioned, for example on a table.
- o Pain prevents me from lifting heavy weights, but I can manage light to medium weights if they are conveniently positioned.
- o I can lift very light weights.
- o I cannot lift or carry anything at all.

Section 4 – Reading

- I can read as much as I want to with no pain in my neck.
- I can read as much as I want to with slight pain in my neck.
- I can read as much as I want with moderate pain.
- I can't read as much as I want because of moderate pain in my neck.
- I can hardly read at all because of severe pain in my neck.
- I cannot read at all.

Section 5-Headaches

- I have no headaches at all.
- I have slight headaches which come infrequently.
- I have slight headaches which come frequently.
- I have moderate headaches which come infrequently.
- I have severe headaches which come frequently.
- I have headaches almost all the time.

Section 6 – Concentration

- I can concentrate fully when I want to with no difficulty.
- I can concentrate fully when I want to with slight difficulty.
- I have a fair degree of difficulty in concentrating when I want to.
- I have a lot of difficulty in concentrating when I want to.
- I have a great deal of difficulty in concentrating when I want to.
- I cannot concentrate at all.

Section 7—Work

- I can do as much work as I want to.
- I can only do my usual work, but no more.
- I can do most of my usual work, but no more.
- I cannot do my usual work.
- I can hardly do any work at all.
- I can't do any work at all

Section 8 – Driving

- I drive my car without any neck pain.
- I can drive my car as long as I want with slight pain in my neck.
- I can drive my car as long as I want with moderate pain in my neck.
- I can't drive my car as long as I want because of moderate pain in my neck.
- I can hardly drive my car at all because of severe pain in my neck.
- I can't drive my car at all.

Section 9 – Sleeping

- I have no trouble sleeping.
- My sleep is slightly disturbed (less than 1 hr. sleepless).
- My sleep is moderately disturbed (1-2 hrs. sleepless).
- My sleep is moderately disturbed (2-3 hrs. sleepless).
- My sleep is greatly disturbed (3-4 hrs. sleepless).
- My sleep is completely disturbed (5-7 hrs. sleepless).

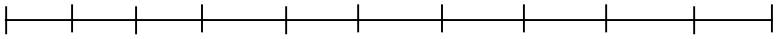
Section 10 – Recreation

- I am able to engage in all my recreation activities with no neck pain at all.
- I am able to engage in all my recreation activities, with some pain in my neck.
- I am able to engage in most, but not all of my usual recreation activities because of pain in my neck.
- I am able to engage in a few of my usual recreation activities because of pain in my neck.
- I can hardly do any recreation activities because of pain in my neck.
- I can't do any recreation activities at all

POST-TEST QUESTIONNAIRE

Part-1: Pain related Question

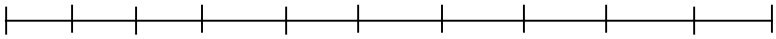
1.1 Pain intensity Cervical region according to the Numeric Pain Rating Scale



0 1 2 3 4 5 6 7 8 9 10

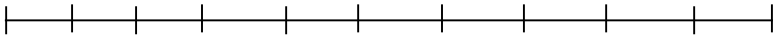
Zero (0) means no pain, five (5) means moderate pain and Ten (10) means extreme pain.

1.2 Pain intensity arm/above elbow region according to the Numeric Pain Rating Scale



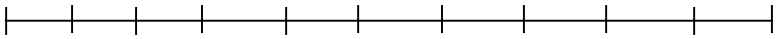
0 1 2 3 4 5 6 7 8 9 10

1.3 Pain intensity forearm/below elbow region according to the Numeric Pain Rating Scale



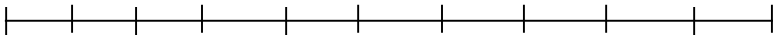
0 1 2 3 4 5 6 7 8 9 10

1.4 Pain intensity during lying position according to the Numeric Pain Rating Scale



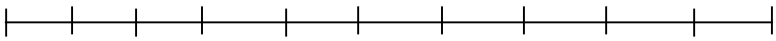
0 1 2 3 4 5 6 7 8 9 10

1.5 Pain intensity during sitting in chair according to the Numeric Pain Rating Scale



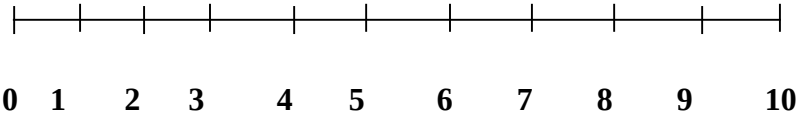
0 1 2 3 4 5 6 7 8 9 10

1.6 Pain intensity during turning neck according to the Numeric Pain Rating Scale

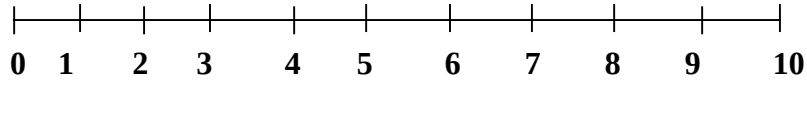


0 1 2 3 4 5 6 7 8 9 10

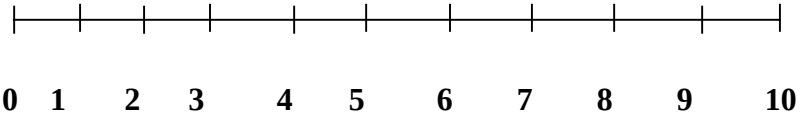
1.7 Pain intensity during walking according to the Numeric Pain Rating Scale



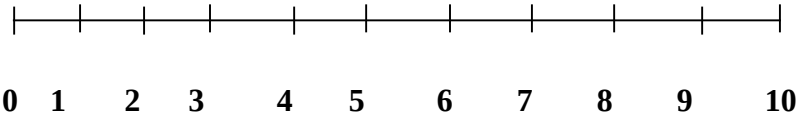
1.8 Pain intensity during sleeping according to the Numeric Pain Rating Scale



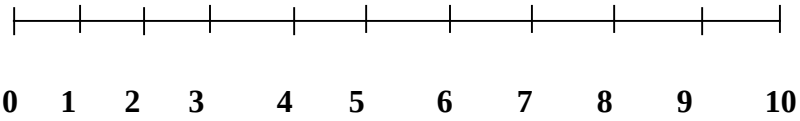
1.9 Pain intensity during lifting object according to the Numeric Pain Rating Scale



1.10 Pain intensity during working according to the Numeric Pain Rating Scale



1.11 Pain intensity during driving according to the Numeric Pain Rating Scale



Part-2: Neck pain disability index

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- My sleep is moderately disturbed (2-3 hrs. sleepless).
- My sleep is greatly disturbed (3-4 hrs. sleepless).
- My sleep is completely disturbed (5-7 hrs. sleepless).

Section 10 – Recreation

- I am able to engage in all my recreation activities with no neck pain at all.
- I am able to engage in all my recreation activities, with some pain in my neck.
- I am able to engage in most, but not all of my usual recreation activities because of pain in my neck.
- I am able to engage in a few of my usual recreation activities because of pain in my neck.
- I can hardly do any recreation activities because of pain in my neck.
- I can't do any recreation activities at all.

Questionnaire (Bangla)

প্রি-টেস্ট প্রশ্নাবলী

শিরোনাম: দীর্ঘস্থায়ী ঘাড় ব্যথা রোগীর জন্য নিম্ন-গ্রেডের মেরুদণ্ডের মোবিলাইজেশনের কার্যকারিতা।

পার্ট ১: সামাজিক-জনসংখ্যা সংক্রান্ত তথ্য

১.১ বয়স:

১.২ লিঙ্গ:

১. পুরুষ

২. মহিলা

১.৩ বৈবাহিক অবস্থা

১. বিবাহিত

২. অবিবাহিত

১.৪ শিক্ষাগত যোগ্যতা

১. অক্ষরজ্ঞান সম্পন্ন

২. প্রাথমিক

৩. মাধ্যমিক

৪. উচ্চ মাধ্যমিক

৫. স্নাতক

৬. স্নাতকোত্তর

১.৫ পেশা

১. কৃষক এবং শ্রমিক

২. চাকরিজীবী

৩. গৃহিণী

৪. ব্যবসায়ী

৫. অবসরপ্রাপ্ত

৬. ছাত্র

৭. অন্যরা .....

১.৬ থাকার জায়গা

১. গ্রামীণ

২. মফস্বল

৩. শহুরে

১.৭ পরিবারের আকার

১. একক পরিবার

২. সম্মিলিত পরিবার

১.৮ পরিবারের সদস্য .....

১.৯ মাসিক আয় .....

পার্ট-২: ক্লিনিকাল তথ্য\ব্যথা সম্পর্কিত তথ্য

২.১ ব্যথার ধরন

১. তীব্র ব্যথা

২. মাঝারী তীব্র ব্যথা

৩. দীর্ঘস্থায়ী ব্যথা

২.২ ছড়ানো ব্যথা

১. নেই

২. একহাতে

৩. দুইহাতে

২.৩ কনুই/বাহুর অঞ্চলের উপরে ছড়ানো ব্যথা

১. নেই

২. একহাতে

৩. দুইহাতে

২.৪ কনুইয়ের নীচে/বাহুর অংশে ছড়ানো ব্যথা

১. নেই

২. একহাতে

৩. দুইহাতে

২.৫ এমআরআই রিপোর্ট সন্ধান

১. ডিস্ক প্রোট্রুশন

২. ডিস্ক হার্নিয়েশন

৩. ডিস্ক বালজিং

৪. ডিস্ক সিকোয়েস্ট্রেশন

২.৬ এক্স-রে রিপোর্ট সন্ধান

১. ইনক্রিজ লর্ডোসিস

২. ডিক্রিজ লর্ডোসিস

৩. ফ্ল্যাট সারভাইকাল স্পাইন

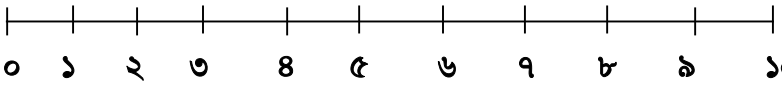
৪. ডিস্ক স্পেস রিডিউজ

৫. ডিজেনারেটিভ চেঞ্জ

৬. নরমাল স্টাডি

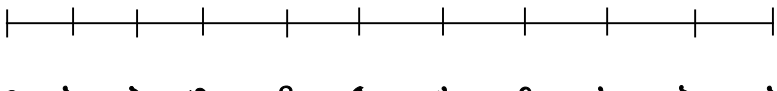
পার্ট-৩: ব্যথা সম্পর্কিত প্রশ্ন

৩.১ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী ঘাড়ে ব্যথার তীব্রতাঃ

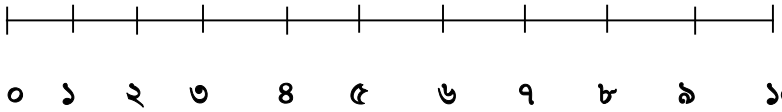


শূন্য (০) মানে ব্যথা নেই, পাঁচ (৫) মানে মাঝারি ব্যথা এবং দশ (১০) মানে চরম ব্যথা।

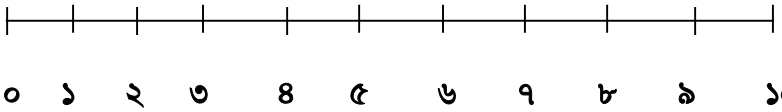
৩.২ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী বাহু/কনুইয়ের উপরে অঞ্চলে ব্যথার তীব্রতা



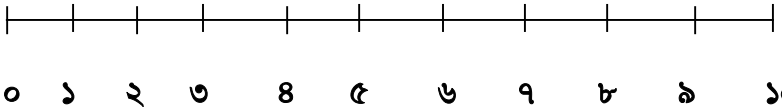
৩.৩ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী বাহু/কনুইয়ের নীচের অঞ্চলে ব্যথার তীব্রতা



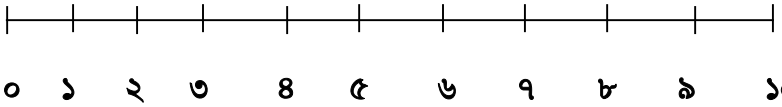
৩.৪ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী শুয়ে থাকার সময় ব্যথার তীব্রতা



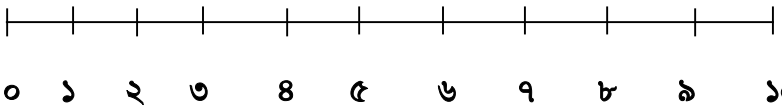
৩.৫ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী চেয়ারে বসার সময় ব্যথার তীব্রতা



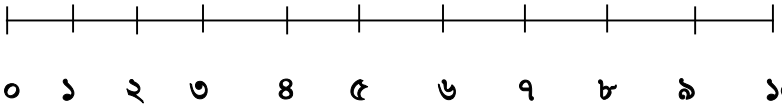
৩.৬ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী ঘাড় ঘোরার সময় ব্যথার তীব্রতা



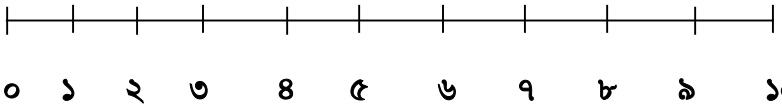
৩.৭ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী হাঁটার সময় ব্যথার তীব্রতা



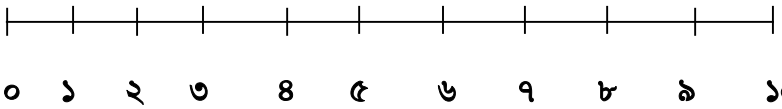
৩.৮ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী ঘুমের সময় ব্যথার তীব্রতা



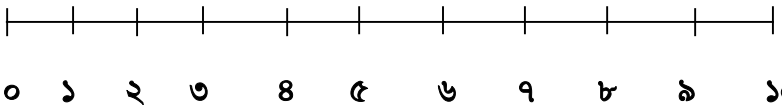
৩.৯ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী বস্তু উত্তোলনের সময় ব্যথার তীব্রতা



৩.১০ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী কাজ করার সময় ব্যথার তীব্রতা



৩.১১ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী গাড়ি চালানোর সময় ব্যথার তীব্রতা



পার্ট-4: নেক পেইন ডিসএবিলিটি ইন্ডেক্স

উত্তর দেওয়ার আগে নির্দেশাবলী পড়ুন.

এই প্রশ্নপত্রটি স্বাস্থ্যসেবা প্রদানকারীকে তথ্য দেওয়ার জন্য ডিজাইন করা হয়েছে যে কীভাবে আপনার ঘাড়ের ব্যথা আপনার দৈনন্দিন জীবনে পরিচালনা করার ক্ষমতাকে প্রভাবিত করেছে। প্রতিটি বিভাগে, শুধুমাত্র একটি বাক্স চিহ্নিত করুন যা আপনার জন্য প্রযোজ্য। আমরা উপলব্ধি করি যে আপনি বিবেচনা করেন যে যেকোনো একটি বিভাগে দুটি বিবৃতি আপনার সাথে সম্পর্কিত, তবে শুধুমাত্র একটিটিকে চিহ্নিত করুন যা আজকের আপনার সমস্যাটিকে সবচেয়ে ঘনিষ্ঠভাবে বর্ণনা করে।

বিভাগ ১ – ব্যথার তীব্রতা

- o এই মুহূর্তে আমার কোন ব্যথা নেই।
- o এই মুহূর্তে ব্যথা খুবই হালকা।
- o এই মুহূর্তে ব্যথা মাঝারি।
- o এই মুহূর্তে ব্যথা মোটামুটি তীব্র।
- o এই মুহূর্তে ব্যথা খুব তীব্র।
- o এই মুহূর্তে ব্যথা সবচেয়ে খারাপ কল্পনা করা যায়।

বিভাগ ২ -- ব্যক্তিগত যত্ন (ধোয়া, ড্রেসিং, ইত্যাদি)

- o আমি অতিরিক্ত ব্যথা ছাড়াই নিজের যত্ন নিতে পারি।
- o আমি সাধারণত নিজের যত্ন নিতে পারি কিন্তু এতে অতিরিক্ত ব্যথা হয়।
- o নিজের যত্ন নেওয়া বেদনাদায়ক এবং আমি ধীরগতির এবং সতর্কতা অবলম্বন করি।
- o আমার কিছু সাহায্য দরকার হয় কিন্তু আমার ব্যক্তিগত যত্নের অধিকাংশই নিজে পরিচালনা করি।

o স্ব-যত্নের বেশিরভাগ ক্ষেত্রে আমার প্রতিদিন সাহায্যের প্রয়োজন হয়।

o আমি জামাকাপড় পরতে পারি না, আমার জামা কাপড় ধুতে এবং বিছানায় থাকতে কষ্ট হয়।

বিভাগ ৩ - উত্তোলন

o আমি অতিরিক্ত ব্যথা ছাড়াই ভারী ওজন তুলতে পারি।

o আমি ভারী ওজন তুলতে পারি কিন্তু এটি অতিরিক্ত ব্যথা দেয়।

o ব্যথা আমাকে মেঝে থেকে ভারী ওজন তুলতে বাধা দেয়, কিন্তু সেগুলি সুবিধামত অবস্থানে থাকলে আমি তুলতে পারি, উদাহরণস্বরূপ একটি টেবিলে।

o ব্যথা আমাকে ভারী ওজন তুলতে বাধা দেয়, তবে আমি হালকা থেকে মাঝারি ওজন তুলতে পারি যদি সেগুলি সুবিধাজনকভাবে অবস্থান করে।

o আমি খুব হালকা ওজন তুলতে পারি।

o আমি কোনোকিছুই তুলতে বা বহন করতে পারি না।

বিভাগ ৪ – পড়া

o আমি আমার ঘাড়ে ব্যথা ছাড়াই যত খুশি পড়তে পারি।

o আমার ঘাড়ে সামান্য ব্যথা হলেও আমি যত খুশি পড়তে পারি।

o আমি মাঝারি ব্যথা নিয়ে যত খুশি পড়তে পারি।

o আমার ঘাড়ে মাঝারি ব্যথার কারণে আমি যতটা চাই ততটা পড়তে পারি না।

o আমার ঘাড়ে প্রচণ্ড ব্যথার কারণে আমি খুব কমই পড়তে পারি।

o আমি মোটেই পড়তে পারি না।

বিভাগ ৫-মাথাব্যথা

o আমার কোনো মাথাব্যথা নেই।

o আমার সামান্য মাথাব্যথা আছে যা মাঝেমাঝে আসে।

o আমার সামান্য মাথাব্যথা আছে যা ঘন ঘন আসে।

o আমার মাঝারি মাথাব্যথা আছে যা মাঝেমাঝে আসে।

o আমার তীব্র মাথাব্যথা আছে যা ঘন ঘন আসে।

o আমার প্রায় সব সময় মাথাব্যথা থাকে।

বিভাগ ৬ – মনোযোগ

o আমি কোন অসুবিধা ছাড়াই যখন চাই তখন পুরোপুরি মনোনিবেশ করতে পারি।

o সামান্য অসুবিধা হলেও আমি পুরোপুরি মনোনিবেশ করতে পারি।

o আমি যখন চাই তখন মনোযোগ দিতে আমার যথেষ্ট অসুবিধা হয়।

o আমি যখন চাই তখন মনোযোগ দিতে আমার অনেক অসুবিধা হয়।

o আমি যখন চাই তখন মনোযোগ দিতে আমার অনেক বেশী অসুবিধা হয়।

o আমি মোটেও মনোনিবেশ করতে পারি না।

বিভাগ ৭—কাজ

o আমি যত কাজ করতে চাই ততটা করতে পারি।

o আমি শুধুমাত্র আমার স্বাভাবিক কাজ করতে পারি, কিন্তু তার বেশী না।

o আমি আমার স্বাভাবিক কাজের বেশিরভাগই করতে পারি, কিন্তু তার বেশী না।

o আমি আমার স্বাভাবিক কাজ করতে পারি না।

o আমি খুব কমই কোনো কাজ করতে পারি।

o আমি কোনো কাজই করতে পারি না

বিভাগ ৮ - ড্রাইভিং

o আমি ঘাড় ব্যথা ছাড়াই আমার গাড়ি চালাই।

o আমার ঘাড়ে সামান্য ব্যথা নিয়ে যতক্ষণ চাই ততক্ষণ গাড়ি চালাতে পারি।

o আমার ঘাড়ে মাঝারি ব্যথা নিয়ে আমি যতক্ষণ চাই ততক্ষণ আমার গাড়ি চালাতে পারি।

o আমার ঘাড়ে মাঝারি ব্যথার কারণে আমি যতক্ষণ চাই ততক্ষণ আমার গাড়ি চালাতে পারি না।

o আমার ঘাড়ে তীব্র ব্যথার কারণে আমি খুব কমই আমার গাড়ি চালাতে পারি।

o আমি আমার গাড়ি মোটেও চালাতে পারি না।

বিভাগ ৯ – ঘুমানো

o আমার ঘুমাতে কোন সমস্যা নেই।

o আমার ঘুম কিছুটা ব্যাহত হয়েছে (১ ঘণ্টার কম। ঘুমহীন) ।

o আমার ঘুম মাঝারিভাবে ব্যাহত (1-2 ঘন্টা। ঘুমহীন) ।

o আমার ঘুম মাঝারিভাবে ব্যাহত (2-3 ঘন্টা। ঘুমহীন) ।

o আমার ঘুম খুব ব্যাহত হয় (3-4 ঘন্টা। ঘুমহীন) ।

o আমার ঘুম সম্পূর্ণভাবে ব্যাহত (5-7 ঘন্টা। ঘুমহীন) ।

বিভাগ ১০ – বিনোদন

o আমি ঘাড়ের ব্যথা ছাড়াই আমার সমস্ত বিনোদনমূলক ক্রিয়াকলাপে নিযুক্ত থাকতে পারি।

o আমি আমার ঘাড়ে কিছুটা ব্যথা সহ আমার সমস্ত বিনোদনমূলক ক্রিয়াকলাপে নিযুক্ত থাকতে পারি।

o আমি বেশিরভাগ ক্ষেত্রেই নিযুক্ত হতে পারি, কিন্তু আমার ঘাড়ে ব্যথার কারণে আমার স্বাভাবিক বিনোদনমূলক ক্রিয়াকলাপে নয়।

o আমার ঘাড়ে ব্যথার কারণে আমি আমার কিছু স্বাভাবিক বিনোদনমূলক ক্রিয়াকলাপে নিযুক্ত হতে পারি।

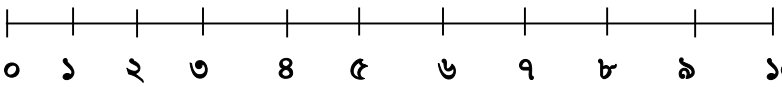
o আমার ঘাড়ে ব্যথার কারণে আমি খুব কমই কোনো বিনোদনমূলক কাজ করতে পারি।

o আমি কোনো বিনোদনমূলক কাজ করতে পারি না।

পোস্ট-টেস্ট প্রশ্নাবলী

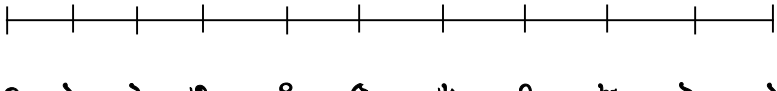
পার্ট-১: ব্যথা সম্পর্কিত প্রশ্ন

১.১ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী ঘাড়ে ব্যথার তীব্রতাঃ

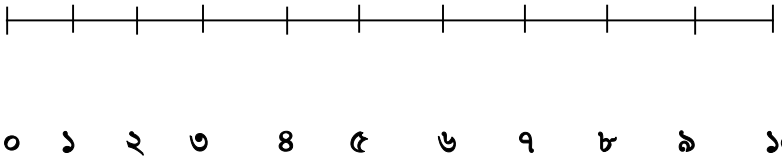


শূন্য (০) মানে ব্যথা নেই, পাঁচ (৫) মানে মাঝারি ব্যথা এবং দশ (১০) মানে চরম ব্যথা।

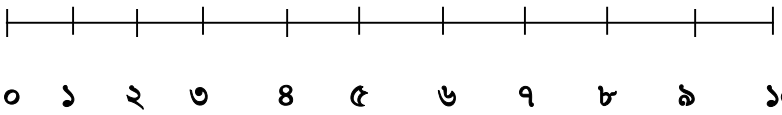
১.২ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী বাহু/কনুইয়ের উপরে অঞ্চলে ব্যথার তীব্রতা



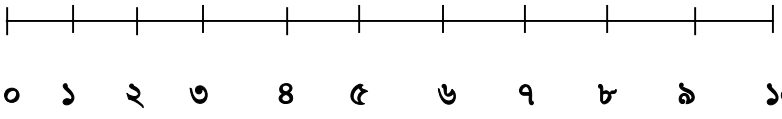
১.৩ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী বাহু/কনুইয়ের নীচের অঞ্চলে ব্যথার তীব্রতা



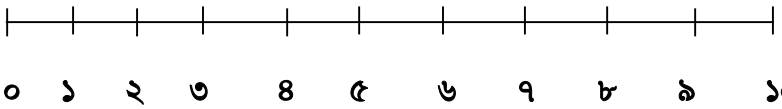
১.৪ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী শুয়ে থাকার সময় ব্যথার তীব্রতা



১.৫ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী চেয়ারে বসার সময় ব্যথার তীব্রতা

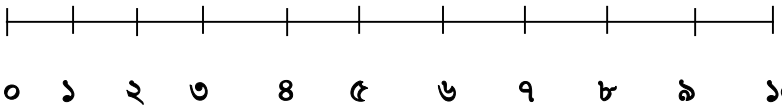


১.৬ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী ঘাড় ঘোরার সময় ব্যথার তীব্রতা



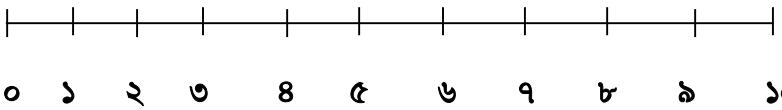
০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

১.৭ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী হাঁটার সময় ব্যথার তীব্রতা



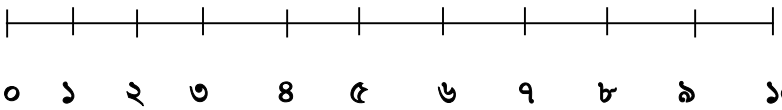
০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

১.৮ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী ঘুমের সময় ব্যথার তীব্রতা



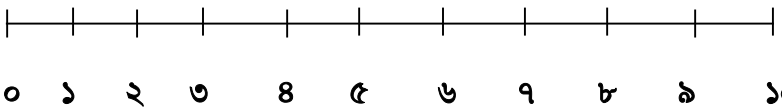
০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

১.৯ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী বস্তু উত্তোলনের সময় ব্যথার তীব্রতা



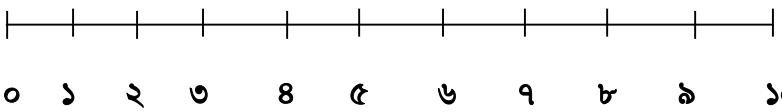
০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

১.১০ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী কাজ করার সময় ব্যথার তীব্রতা



০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

১.১১ নিউমেরিক পেইন রেটিং স্কেল অনুযায়ী গাড়ি চালানোর সময় ব্যথার তীব্রতা



০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

পার্ট-২: নেক পেইন ডিসএবিলিটি ইন্ডেক্স

উত্তর দেওয়ার আগে নির্দেশাবলী পড়ুন.

এই প্রশ্নপত্রটি স্বাস্থ্যসেবা প্রদানকারীকে তথ্য দেওয়ার জন্য ডিজাইন করা হয়েছে যে কীভাবে আপনার ঘাড়ের ব্যথা আপনার দৈনন্দিন জীবনে পরিচালনা করার ক্ষমতাকে প্রভাবিত করেছে। প্রতিটি বিভাগে, শুধুমাত্র একটি বাক্স চিহ্নিত করুন যা আপনার জন্য প্রযোজ্য। আমরা উপলব্ধি করি যে আপনি বিবেচনা করেন যে যেকোনো একটি বিভাগে দুটি বিবৃতি আপনার সাথে সম্পর্কিত, তবে শুধুমাত্র একটিটিকে চিহ্নিত করুন যা আজকের আপনার সমস্যাটিকে সবচেয়ে ঘনিষ্ঠভাবে বর্ণনা করে।

বিভাগ ১ – ব্যথার তীব্রতা

- o এই মুহূর্তে আমার কোন ব্যথা নেই।
- o এই মুহূর্তে ব্যথা খুবই হালকা।
- o এই মুহূর্তে ব্যথা মাঝারি।
- o এই মুহূর্তে ব্যথা মোটামুটি তীব্র।
- o এই মুহূর্তে ব্যথা খুব তীব্র।
- o এই মুহূর্তে ব্যথা সবচেয়ে খারাপ কল্পনা করা যায়।

বিভাগ ২ -- ব্যক্তিগত যত্ন (ধোয়া, ড্রেসিং, ইত্যাদি)

- o আমি অতিরিক্ত ব্যথা ছাড়াই নিজের যত্ন নিতে পারি।
- o আমি সাধারণত নিজের যত্ন নিতে পারি কিন্তু এতে অতিরিক্ত ব্যথা হয়।
- o নিজের যত্ন নেওয়া বেদনাদায়ক এবং আমি ধীরগতির এবং সতর্কতা অবলম্বন করি।
- o আমার কিছু সাহায্য দরকার হয় কিন্তু আমার ব্যক্তিগত যত্নের অধিকাংশই নিজে পরিচালনা করি।

o স্ব-যত্নের বেশিরভাগ ক্ষেত্রে আমার প্রতিদিন সাহায্যের প্রয়োজন হয়।

o আমি জামাকাপড় পরতে পারি না, আমার জামা কাপড় ধুতে এবং বিছানায় থাকতে কষ্ট হয়।

বিভাগ ৩ - উত্তোলন

o আমি অতিরিক্ত ব্যথা ছাড়াই ভারী ওজন তুলতে পারি।

o আমি ভারী ওজন তুলতে পারি কিন্তু এটি অতিরিক্ত ব্যথা দেয়।

o ব্যথা আমাকে মেঝে থেকে ভারী ওজন তুলতে বাধা দেয়, কিন্তু সেগুলি সুবিধামত অবস্থানে থাকলে আমি তুলতে পারি, উদাহরণস্বরূপ একটি টেবিলে।

o ব্যথা আমাকে ভারী ওজন তুলতে বাধা দেয়, তবে আমি হালকা থেকে মাঝারি ওজন তুলতে পারি যদি সেগুলি সুবিধাজনকভাবে অবস্থান করে।

o আমি খুব হালকা ওজন তুলতে পারি।

o আমি কোনোকিছুই তুলতে বা বহন করতে পারি না।

বিভাগ ৪ – পড়া

o আমি আমার ঘাড়ে ব্যথা ছাড়াই যত খুশি পড়তে পারি।

o আমার ঘাড়ে সামান্য ব্যথা হলেও আমি যত খুশি পড়তে পারি।

o আমি মাঝারি ব্যথা নিয়ে যত খুশি পড়তে পারি।

o আমার ঘাড়ে মাঝারি ব্যথার কারণে আমি যতটা চাই ততটা পড়তে পারি না।

o আমার ঘাড়ে প্রচণ্ড ব্যথার কারণে আমি খুব কমই পড়তে পারি।

o আমি মোটেই পড়তে পারি না।

বিভাগ ৫-মাথাব্যথা

o আমার কোনো মাথাব্যথা নেই।

o আমার সামান্য মাথাব্যথা আছে যা মাঝেমাঝে আসে।

o আমার সামান্য মাথাব্যথা আছে যা ঘন ঘন আসে।

o আমার মাঝারি মাথাব্যথা আছে যা মাঝেমাঝে আসে।

o আমার তীব্র মাথাব্যথা আছে যা ঘন ঘন আসে।

o আমার প্রায় সব সময় মাথাব্যথা থাকে।

বিভাগ ৬ – মনোযোগ

o আমি কোন অসুবিধা ছাড়াই যখন চাই তখন পুরোপুরি মনোনিবেশ করতে পারি।

o সামান্য অসুবিধা হলেও আমি পুরোপুরি মনোনিবেশ করতে পারি।

o আমি যখন চাই তখন মনোযোগ দিতে আমার যথেষ্ট অসুবিধা হয়।

o আমি যখন চাই তখন মনোযোগ দিতে আমার অনেক অসুবিধা হয়।

o আমি যখন চাই তখন মনোযোগ দিতে আমার অনেক বেশী অসুবিধা হয়।

o আমি মোটেও মনোনিবেশ করতে পারি না।

বিভাগ ৭—কাজ

o আমি যত কাজ করতে চাই ততটা করতে পারি।

o আমি শুধুমাত্র আমার স্বাভাবিক কাজ করতে পারি, কিন্তু তার বেশী না।

o আমি আমার স্বাভাবিক কাজের বেশিরভাগই করতে পারি, কিন্তু তার বেশী না।

o আমি আমার স্বাভাবিক কাজ করতে পারি না।

o আমি খুব কমই কোনো কাজ করতে পারি।

o আমি কোনো কাজই করতে পারি না

বিভাগ ৮ - ড্রাইভিং

o আমি ঘাড় ব্যথা ছাড়াই আমার গাড়ি চালাই।

o আমার ঘাড়ে সামান্য ব্যথা নিয়ে যতক্ষণ চাই ততক্ষণ গাড়ি চালাতে পারি।

o আমার ঘাড়ে মাঝারি ব্যথা নিয়ে আমি যতক্ষণ চাই ততক্ষণ আমার গাড়ি চালাতে পারি।

o আমার ঘাড়ে মাঝারি ব্যথার কারণে আমি যতক্ষণ চাই ততক্ষণ আমার গাড়ি চালাতে পারি না।

o আমার ঘাড়ে তীব্র ব্যথার কারণে আমি খুব কমই আমার গাড়ি চালাতে পারি।

o আমি আমার গাড়ি মোটেও চালাতে পারি না।

বিভাগ ৯ – ঘুমানো

o আমার ঘুমাতে কোন সমস্যা নেই।

o আমার ঘুম কিছুটা ব্যাহত হয়েছে (১ ঘণ্টার কম। ঘুমহীন) ।

o আমার ঘুম মাঝারিভাবে ব্যাহত (1-2 ঘন্টা। ঘুমহীন) ।

o আমার ঘুম মাঝারিভাবে ব্যাহত (2-3 ঘন্টা। ঘুমহীন) ।

o আমার ঘুম খুব ব্যাহত হয় (3-4 ঘন্টা। ঘুমহীন) ।

o আমার ঘুম সম্পূর্ণভাবে ব্যাহত (5-7 ঘন্টা। ঘুমহীন) ।

বিভাগ ১০ – বিনোদন

o আমি ঘাড়ের ব্যথা ছাড়াই আমার সমস্ত বিনোদনমূলক ক্রিয়াকলাপে নিযুক্ত থাকতে পারি।

o আমি আমার ঘাড়ে কিছুটা ব্যথা সহ আমার সমস্ত বিনোদনমূলক ক্রিয়াকলাপে নিযুক্ত থাকতে পারি।

o আমি বেশিরভাগ ক্ষেত্রেই নিযুক্ত হতে পারি, কিন্তু আমার ঘাড়ে ব্যথার কারণে আমার স্বাভাবিক বিনোদনমূলক ক্রিয়াকলাপে নয়।

o আমার ঘাড়ে ব্যথার কারণে আমি আমার কিছু স্বাভাবিক বিনোদনমূলক ক্রিয়াকলাপে নিযুক্ত হতে পারি।

o আমার ঘাড়ে ব্যথার কারণে আমি খুব কমই কোনো বিনোদনমূলক কাজ করতে পারি।

o আমি কোনো বিনোদনমূলক কাজ করতে পারি না।

INTERVENTION

Conventional Physiotherapy for chronic neck pain

Treatment option	**Duration/ Repetition**
Soft tissue release technique	3-5 minutes
Manual cervical traction	5-10 minutes
Traction with rotation	3-5 minutes
Isometric strengthening exercise	3 minutes
stretching exercise	2-3 minutes
Retraction	6 repetitions
Retraction with over pressure	10 repetitions
Retraction extension	10 repetitions
Ice	5 minutes
TENS	5-7 minutes
IRR	10 minutes

Experimental Physiotherapy guideline:

Treatment	Description	Dose
Low grade spinal mobilization (grade- I-II).	**Patient position:** patient in prone position. **Therapist position:** infront of the patient head. **Direction:** P-A (Posteroanterior), centrally. **Procedure:** therapist will put his both thumb on the spine. Grade I – small amplitude movement at the beginning of the availablerange of movement Grade II – large amplitude movement at within the available range of movement	5-10 minutes (120 movements per minute).

(Maitland et al., 2005, R Kanlayanaphotporn et al., 2009)

The Chairman

Institution Review Board (IRB)

Bangladesh Health Professions Institute (BHPI)

CRP, Savar, Dhaka-1343, Bangladesh.

Subject: Application for review and ethical approval.

Dear Sir,

With due respect, I am Mahmudul Hasan student of 4th professional B. Sc. in physiotherapy at Bangladesh Health Professions Institute (BHPI), academic institute of Center for the Rehabilitation of the Paralysed (CRP) under the faculty of medicine of university of Dhaka. As per the course curriculum, I have to conduct a thesis entitled, **"Effectiveness of low-grade spinal mobilization for the patient with chronic neck pain"** under the supervision of Mohammad Anwar Hossain, Associate professor (BHPI), Senior Consultant and Head of the department of Physiotherapy, CRP, Savar, Dhaka-1343. The purpose of the study is to find out the effectiveness of low-grade spinal mobilization for the patients with chronic neck pain. The study will be conducted a randomized control trial design with two different subject groups. Total 20 samples will be included in this study; among them 10 patients will be selected for the experimental group (low grade mobilization) and rest 10 patients will be selected for control group (conventional physiotherapy only). The study area will be Musculoskeletal unit of Physiotherapy department at Centre for the Rehabilitation of the Paralyzed (CRP) in Savar, Dhaka-1343. I would like to assure that anything of my study will not be harmful for the participants. Informed consent will be received from all participants, data will be kept confidential.

Therefore, I look forward to having your kind approval for the research project and to start data collection. I can also assure you that I will maintain all the requirements for study.

Sincerely

Mahmudul Hasan

Mahmudul Hasan
4th professional B.Sc. in Physiotherapy
Roll: 43, Session: 2015-16,
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Thesis presentation date: 17th October 2021

Head of Department

B.Sc. in Physiotherapy, BHPI.

Md. Shofiqul Islam
Associate Professor & Head
Department of Physiotherapy
Bangladesh Health Professions Institute (BHPI)
CRP, Chapain, Savar, Dhaka-1343

Recommendation from the thesis supervisor:

Mohammad Anwar Hossain

Associate Professor (BHPI)

Senior Consultant and Head of the department of Physiotherapy, CRP, Savar, Dhaka-1343

বাংলাদেশ হেল্‌থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
Bangladesh Health Professions Institute (BHPI)
(The Academic Institute of CRP)

Ref: CRP/BHPI/IRB/02/2022/532549

Date: 20/02/2022

Mahmudul Hasan
4th year B.Sc. in Physiotherapy
Session: 2015-2016, Student ID: 112150290
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of the thesis proposal **"Effectiveness of low-grade spinal mobilization for the patient with chronic neck pain."** by ethics committee.

Dear Mahmudul Hasan,
Congratulations.
The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above-mentioned dissertation, with yourself, as the principal investigator and Mohammad Anwar Hossain as thesis supervisor. The Following documents have been reviewed and approved:

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

The purpose of the study is to find out what type of patient is receiving physiotherapy and what actual treatment they are getting through. The study involves use of a questionnaire to explore that may take 20 to 30 minutes to answer the questionnaire and there is no likelihood of any harm to the participants. The members of the Ethics committee have approved the study to be conducted in the presented from at the meeting held at **09.00** AM on October 12, 2021 at BHPI (30th IRB Meeting).

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