COMPARISON BETWEEN TRIGGER POINT COMPRESSION AND TRIGGER POINT PRESSURE RELEASE ON UPPER ACTIVE TRAPEZIUS TRIGGER POINT FOR MECHANICAL 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

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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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Contents

	Page no
Acknowledgement	i
Acronyms	ii
List of tables	iii
List of figures	iv
Abstract	v
CHAPTER I: INTRODUCTION	1-9
Background	1-5
Justification/rationale	6
Aim	7
Objectives	7
Hypothesis	8
Operational definition	9
CHAPTER II: LITERATURE REVIEW	10-14
CHAPTER III: METHODOLOGY	15-36
3.1 Study design	15
3.2 Flow chart	16
3.3 Study area	17
3.4 Study duration	17
3.5 Study population	17
3.6 Sample size	17
3.7 Sampling technique	17
3.8 Inclusion criteria	18
3.9 Exclusion criteria	19
3.10 Methods of data collection	19

3.10.1 Data collection tools 19
3.10.2 Questionnaire 19
3.11 Measurement tools 19
3.11.1 Numeric pain rating scale 19
3.11.2 Goniometer 20
3.11.3 Neck pain disability index 20
3.12 Data collection procedure 20-21
3.13 Data analysis 21
3.14 Statistical test 21
3.15 Intervention 21
3.16 Hypothesis test 22-36
3.17 Significant levels 37
3.18 Elimination of confounding variables 37
3.19 Inform consent 37
3.20 Ethical consideration 38
CHAPTER IV: RESULT 37-47
CHAPTER V: DISCUSSION 48-50
CHAPTER VI: CONCLUSION & RECOMMENDATION 51
REFERENCES 52-58
APPENDIX 59-88

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Acronyms

&:	And
BMRC:	Bangladesh medical research council
CRP:	Center for the Rehabilitation of the paralyzed
Cm:	Centimeter
NP:	Neck pain
Trp:	Trigger point
MTrp:	Myofascial trigger point
NPRS:	Numeric pain rating scale
NDI:	Neck pain disability scale
ROM:	Range of motion
NSAID:	Non-steroidal anti-inflammatory drugs
TENS:	Transcutaneous electrical nerve stimulation
WHO:	World Health Organization

List of Tables

Tables	Descriptions	Page no
Table 1	Sociodemographic portion	37
Table 2	Measurement of NPRS of within groups	23-25
Table 3	Measurement of NPRS of between groups	27-29
Table 4	Measurement of ROM of with in groups	31
Table 5	Measurement of NDI of within groups	32
Table 6	Measurement of ROM of between groups	34
Table 7	Measurement of NDI of between groups	34

List of Figures

Figures	Description	Page no
Figure 01	Application procedure of trigger point compression	82
Figure 02	Application procedure of trigger point pressure release	83

Abstract

Purpose: To find out the effectiveness of trigger point compression and trigger point pressure release on upper active trapezius trigger point for mechanical neck pain. **Objectives:** To assess the effects of pain, range of motion and functional outcome of neck after applying the trigger point compression and trigger point pressure release exercise. **Methodology:** The study design was quantitative clinical trial. 30 participants with neck pain were allocated (based on inclusion and exclusion criteria). The age range was 18-60 years. They were divided in two groups named as trigger point compression and trigger point pressure release. Each group contained 15 participants. They received 8 sessions of treatment. Numeric pain rating scale (NPRS), neck pain disability index scale (NDI) and measurement of range of motion were used in this study to see the effectiveness in pretest and posttest way. NPRS was used to measure the pain intensity in different functional position, goniometer was used to measure the range of motion and NDI was used to measure the functional outcome. **Result:** Following treatment the study was found that the trigger point compression group showed better improvement than trigger point pressure release group. In Trp compression group the pain intensity, range of motion and functional outcome of neck showed significant improvement where p value was <0.05. In Trp pressure release group didn't show that much improvement like Trp compression group where p value was >0.05. But both groups showed significant improvement in functional outcome ($p<0.05$). Though both treatments were effective in functional outcome, it was accepted in this study that trigger point compression is superior to trigger point pressure release for mechanical neck pain. Conclusion: This quantitative clinical trial study shows that trigger point compression is more effective than trigger point pressure release for mechanical neck pain.

CHAPTER – I INTRODUCTION

1.1 Background

Neck pain is very common and the rate of neck pain is increasing day by day in many countries (Hoy, et al., 2014). Musculoskeletal problems are major source of activity restriction and participation restriction in daily activities. Chronic neck pain is described as discomfort in the neck that is referred into one or more of the cranial nerves or both upper limbs and this pain lasts for at least three months (Hoy, et al., 2014). The occurrence of neck pain is a problem that affects people all around the world. Neck pain is very common in the United States. Worldwide, the current population is 7.9 billion. Neck pain is becoming more common. In 2017, females had a greater global point prevalence of neck discomfort than males, it was not statistically significant at the 0.05 level.

The prevalence of the disease increased with age until it reached 70-74 years old, after which it began to decline (Henschke, et al., 2015). In contrast, the prevalence of neck discomfort is increasing year after year, causing global disability (Hoy, et al., 2014). Furthermore, from 23.9 million in 1990 to 33.6 million in 2010, disability-adjusted life years were increased. There are 291 criteria in total. Neck discomfort was ranked fourth in the Global Burden of Disease 2010 Study, highest in terms of disability as assessed by years lived with disability (YLDs) and lowest in terms of disability as measured by years lived with disability (YLDs) in terms of overall burden, we are ranked 21st.Various sort of musculoskeletal disorders or issues produce head, neck and shoulder pain which can be compared with different joints, for example, elbow, wrist and fingers. In this case, the occurrence rate of pain is half (Young, 2012).

There are two reasons of musculoskeletal disorder, it can either be traumatic or pathological and it tends to be happened from improper or bad posture. The region of traumatic and non-traumatic musculoskeletal pain is commonly neck pain and so, neck pain is very usual within all kind of all musculoskeletal pain (Metwally, et al.,2007). In the study of Global Burden of Disease 2010, neck pain positioned fourth most elevated as far as incapacity out of the 291 conditions (Wang, et al., 2016). Neck pain expanded from 23.9

million to 33.6 million from 1990-2010 more typical in ladies than men and most elevated in the 40-45 years age range according to Disability Adjusted life years (DALYs) (Wang, et al., 2016). At some random time, 10% to 20% of the population report neck pain with 54% of them having experienced neck pain within the recent a half year (Childs, et al., 2008). In the Global Burden of Disease 2017 study, the prevalence of neck pain per 10, 000 population was 3551.1 and the occurrence of neck pain per 10, 000 population was 806.6 and disability or handicap from neck pain per 10, 000 population was 352.2.

These evaluations did not change remarkably between 1990 and 2010. The rate of prevalence rate elevated up to 70-74 years of age and then gradually reduced. Another study of Global Burden of Disease 2010 shows that statistically remarkable decrease in the worldwide age normalized point incidence rate from 4.9% to 3.5% has been seen (Hoy, et al., 2013). Highly rich North American and western Europe had the most elevated age normalized point of incidence rate were additionally found in research. But the study of 2017 shows that, western Europe and east Asia had the most age normalized point of prevalence rates (Vos, et al., 2017). The occurrence rate of neck pain is most common in females than males (Hoy, et al., 2013). Lifetime prevalence for mechanical neck pain is 45-54% in the general population (Farnandez, et al., 2006) and 30% of men and 50% of women are experiencing it (Dziedzic, et al., 2005). Prevalence of neck pain has been assessing between 13.4% to 22.2% (Sarringovallis, et al., 2005). Neck pain can be changed over the constant structure and 14% patients are in danger (Saturno, et al., 2003`). This can happen by absenteeism from work.

The national age rate of neck pain in 2017 extended from 2443.9 to 6151.2 cases per 100,000 population. The most elevated predominance of neck pain according to age are found in Norway, Finland and Denmark. In contrast the most reduce ranges are found in South Sudan and Burundi. The national age normalized yearly frequency of neck pain in 2017 differed from 599.6 in Canada to 1145 cases for every100,000 population in Norway. So, the most elevated range are found in Norway, Iran, China and the least range are found in Canada and Pakistan. The inability from neck pain generously changes between nations from 1990- 2017. The rates rise in UK (14.6%) and Sweden (10.4%) and diminishes in Taiwan (10.4%), New Zealand (7.4%) (Moradi-Lakeh, et al., 2017).

Trapezius is a major diamond shaped muscle and it comprises with 3 sections: the upper, center and lower part. The shield of the shoulder is maintained by trapezius. It originates from the backward of the skull. It reaches out from the spine of the C7to T2 vertebrae. External 33%of the collarbone, acromion process and the spine of the shoulder border line are connected by trapezius muscle. Nerve supply of trapezius muscle is the accessory nerve and the C1-C4 cervical nerve roots. Neck pain or shoulder pain will be perpetually demonstrating the pain is frequently situated in the part of upper trapezius. In neck pain and mid-back pain, patients show the side effect of migraine, dizziness with pain and tightness or spasm of trapezius muscle. Upper trapezius muscle is assigned as postural muscle and the pain is showed up during rest, increased by activity. If there is primary inflammation, then pain refers one to other region and patients can feel pain in passive range of motion. It is limited because of pain and defensive spasm in agonist group of muscle. Mechanical neck pain influences 45-54% of overall individual by carrying sitting posture for long period of time. It may sometimes cause conditions such as trapezitis (Negrale, 2010).

Passive resistance to motion is reduced in an upright neutral cervical spine posture. The muscular sleeve created by the longus colli muscle anteriorly and the semispinalis cervicis and cervicalis muscle posteriorly provides support for the cervical segments, posteriorly multifidus muscle is the significance of deep muscles in the maintenance of a healthy body. If just the cervical position is known, a zone of local segmental instability results. The sternocleidomastoid and anterior scalene muscles are big superficial neck muscles moved as a result of being aroused. To stabilize the cervical segments, deep cervical muscle activity must work in tandem with superficial muscle activity, especially in the functional mid-range of the cervical spine (Falla, et al., 2013). Muscle of the cervical spine up to 70% of people with neck pain have been shown to have deficits. The Cervical pain, loss of range of motion, and other symptoms are prevalent, reduced strength, endurance, and forward head position (Rezasoltani, et al.,2010).

Local pain is also called as myofascial pain syndrome (MPS) which is caused by myofascial trigger points and tense fiber (Zamani, et al.,2017). The broadest reason for myofascial pain is myofascial trigger points. Myofascial trigger point is a hyperirritable

spot in skeletal muscle that is related with an overly sensitive palpable nodule in the tight band. Number of conditions including hereditary qualities, maturing and strenuous activities can be created by MTrP. Macro trauma or cumulative microtraumais brought about by MTrP. Examples of cumulative microtrauma are abnormal posture, dull movement and mental pressure. This condition may altogether influence patient's everyday life and even mental condition (Marklund & Wannum, 2008).

There are two types myofascial trigger points (MTPs), one is active and second one is latent (Gonesh, et al., 2015). The dynamic myofascial trigger points comprise of pain indicated by certain motion, decreased elasticity of muscle, muscle weakness and so on (Huang, et al., 2015). Latent MTP have the equivalent clinical features as active MTP but the pain is not persistent rather it is raised by direct pressure (Hoy, et al., 2014). Both sort of MTPs is related with neck pain by the predominance rate is high in latent myofascial trigger points (Yeganeh et al., 2016). Different systems are applied to decrease or reduce the symptoms of MTP, for example, trigger point pressure (Simons, et al., 2005), trigger point pressure release, massage (Williams, et al.,2010), needling (Kostopolus, et al., 2008), vanpooling spray and stretch, electrical stimulation, laser treatment, ultrasound, and diathermy and so forth (Mense, et al., 2003). Trigger point pressure and activator trigger point release is one of the suitable treatment methods for myofascial trigger points of upper trapezius muscle.

Trigger point pressure is performed by painful grip through the thumb or fingertip with constant manual pressure against the tissue barrier of MTPs (Simons, et al., 2005). MTrP bands and nodules are found because of localized protruding and shortening of the sarcomeres in a muscle fiber (Sciotti, et al., 2001). Trigger point pressure misshape the muscle fiber, pulling separated the actin / myosin cross bridges re-establishing the muscle fiber to full length (Gemmell, et al.,2008). The technique of trigger point pressure is relying upon the activation of blood supply to the MTP zone (Hou et al., 2002). The pressure is applied until the therapist or advisor feels relaxation of the main influenced tissue. The duration of trigger point pressure is about 60-90 seconds (Durall, 2012).

Trigger point pressure release is a non-excruciating strategy that gradually increased the pressure with the thumb over the trigger point until a tissue boundary is found. The degree

of pressure is kept up with the release of tissue boundary. The pressure is increased when another tissue boundary is recognized (Simons, 2005). This strategy is continued until the trigger points or tenderness are completely gone. The normal length of this technique is about 90s. It is a manual method that reestablishes a muscle to its ordinary resting tone. Somatic brokenness of hypertonic muscles is identified through the arrangement of trigger points.

Parts are set by the starting point and insertion of the hypertonic muscle. Hindrance of the activation of muscle spindle reduce the measure of efferent impulses to the brain. This causes moving efferent impulse to a similar muscle. The efferent impulse protects the tissue from over stretched. By following this pathway, the patient's muscle becomes relax and accept an ordinary resting tone. It is a slow procedure. The muscle is consequently come back to the neutral position without terminating of the muscle spindle (Williams, 2010).

The point of this study is to analyze the quick impact of trigger point pressure and activator trigger point release treatment on upper part of trapezius trigger point for mechanical neck pain.

1.2 Rationale

Neck pain is the sensation of discomfort in the neck area. Neck pain can result disorders of any of the structures in the neck including cervical vertebra, intervertebral disc, muscles, nerves, lymphatic organ, thyroid or parathyroid gland etc. it is the most common complain of all people around the world. It can occur at any age but elderly people over 45 years are prevalent. It is more common in women than men. The prevalence of neck pain is increasing worldwide day by day. People with neck pain face difficulty in daily works such as: cooking, reading, sleeping, carrying weight etc. Abnormality of trapezius muscle is related with neck pain. Patients also feels discomfort in moving of the neck due to pain and tightness of the trapezius muscle. According to different literature, there are various treatment procedure are applied for neck pain.

There are many common treatment procedures such as: soft tissue mobilization, Manipulation, Traction, Massage, Ice, Ultrasound therapy (UST), Transcutaneous electrical nerve stimulation (TENS) etc. used in the Center for the Rehabilitation of the Paralyzed (CRP), in Musculoskeletal unit, Savar, Dhaka.

Research shows that trigger point compression and trigger point pressure release both are effective in the treatment for neck pain. These two methods help to reduce pain, reduce muscle stiffness, improve muscle functioning, increase joint range of motion and enhance the activities of daily living.

1.3 Aim

The aim of this study to compare between trigger point compression and trigger point pressure release therapy on upper trapezius muscle for mechanical neck pain. There are some achievements in physiotherapy interventions in neck pain patients such as individual trigger point compression and individual trigger point pressure release technique but actually which is the best and effective approach are not clearly known. So, the purpose of the study to compare between this technique to find out which one is very much effective for the patient.

1.4 Objectives

- To find out the effectiveness of trigger point compression and trigger point pressure release technique on upper trapezius muscle for mechanical neck pain.
- To find out the socio-demographic factors affect the level of pain and functional disability within and between groups.
- To measure the level of pain before and after applying the trigger point compression and trigger point pressure release on upper trapezius muscle for neck pain.
- To check the strength and intrigity of the muscle.
- To measure the joint range of motion.
- To compare the functional disability before and after introducing the trigger point compression and trigger point pressure release on upper trapezius for neck pain.

1.5 Hypothesis

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.

Trigger point compression is an effective intervention for the treatment for upper active trapezius trigger point of mechanical neck pain.

Null Hypothesis

Ho:$1-\mu 2 = 0$ 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.

Trigger point pressure release is an effective intervention for the treatment for upper active trapezius trigger point of mechanical neck pain.

Where,

Ho= Null hypothesis

Ha = Alternative hypothesis

$\mu 1$ = Mean difference in initial assessment

$\mu 2$ = Mean difference in final assessment

1.6 Operational definition

Neck pain: Neck pain is the sensation of discomfort in the neck area. Neck pain can result from disorders of any of the structures in the neck including the cervical vertebra and intervertebral disc, nerves, muscles, blood vessels, esophagus, larynx, trachea, lymphatic organs, thyroid glands or parathyroid glands etc.

Trigger point compression: It is the mechanical treatment of myofascial trigger points that consists of application of sustained pressure for a long time to inactivate the trigger point.

Trigger point pressure release: It is an alternative medicine therapy claimed to be useful for treating skeletal muscle immobility and pain by relaxing the contracted muscles, improving blood, oxygen and lymphatic circulation and stimulating the stretch of reflex muscle**.**

CHAPTER – II LITERATURE REVIEW

Musculoskeletal problems are a constant threat to one's quality of life because they can limit everyday activities, cause absence from work, and lead to a change or termination of job. As a result, problems are costly. They are accountable for the greatest number of healthy years in society and for patients. (El-Sodany, et al., 2014). The number of days lost due to musculoskeletal problems is increasing. One of the most prevalent musculoskeletal problems that affects people is work-related discomfort, tens of millions of people in a variety of jobs or service industries around the world. Functional anatomy is the interpretation of physical features of anatomic structures based on their functional purpose. The anatomy of the cervical spine differs significantly from that of the lumbar spine. the thoracic or lumber spine has supporting ligaments, capsular, and supporting ligaments provide a wide range of motion in all directions (Gupta, et al.,2013).

Structure with muscular and cartilaginous components. The cervical spine is the most difficult to treat the body's articular structure. The cervical spine allows for a large range of motion in which the head moves in respect to the trunk. The top end of the spinal column, or spine, which supports and protects the spinal cord, is found in the neck. Cervical vertebrae are the seven bones in the neck. Intervertebral discs are gristle (cartilage) discs that sit between the bones and discs.

Facet joints connect the sides of the bones. There are numerous ligaments and muscles are connected to the spine and extend from the neck to the shoulder blades and back. In the neck, there are seven vertebrae, which are the bony building blocks of the spine. The spinal cord and canal are surrounded by the cervical vertebrae.

In other words, the cervical spine (neck) is made up of vertebrae that start in the upper torso and end at the base of the skull. The spine's support is provided by the bone vertebrae and ligaments (which act like thick rubber bands). The muscles provide support and movement. The neck has a lot of range of motion and helps to support the head's weight (Childs, et al.,2008).

The most prevalent form of chronic neck pain is mechanical neck discomfort. Minor injuries or sprains of the neck's muscles or ligaments are among the causes. Another typical reason is bad posture (Chaitow & Crenshaw, 2006) Neck pain is more common in persons who spend a lot of time on their computers, a day spent bending forward at a desk. As soon as the innervated structure is mechanically deformed, pain is felt enough to irritate nerve endings that aren't attached to anything. The application of forces will produce pain, enough to cause structural stress or deformation It is not required to do physical harm in order to cause pain, tissues containing free nerve endings. The discomfort will go away.

Neck pain is an exceptionally predominant condition that causes significant pain, disability, and monetary expense (Henschke, et al., 2015). It establishes significant individual's personal burden as well as influences families and the wellbeing framework and monetary structure of nations (Hayes, et al., 2013). Neck pain can be the after effect of tight trapezius muscles, and the trapezius muscle may turn into spasmodic because of neck pain. The trapezius musculature is an inverted triangle which begins at the base of the skull, spreads over the shoulders and down to the mid back.

These muscles are profoundly defenseless to abuse. They are the muscles that additionally frequently carry the brunt of stress. Stretching exercises, soft tissue release, and trigger point therapy for neck and traps can help dispose of the spasms and tightness that trigger pain (Sharifullah, et al.,2018). The trapezius muscles help with the capacity of neck rotation, side bending and extension. Tightness in the muscles can diminish the scope of movement of the neck. The diminishing movement can adversely impact the mobility of the cervical joints. Restricted range of movement makes an expansion in soft tissue tightness, with a resulting pain-spasm cycle which can be hard to break. Myofascial trigger point is the regular reason for neck pain which is mostly happened in trapezius muscle. (Guez, et al.,2002)

Myofascial pain condition and its trigger point have been portrayed utilizing different terms over 100 years back (Skootsky, et al., 2000). Over fifty years back Bonica (1957) cleared that trigger points were a typical reason for serious, disabling pain when all is said in done clinical practice (Yap, et al., 2007). Surveys since the time have arrived at a similar

resolution. Different clinical examinations have additionally demonstrated trigger points to be a prevalent condition. Upper trapezius muscle is accounted to be the most generally influenced with trigger points. Myofascial trigger points (MTrPs) are professed to be a typical source of musculoskeletal pain in individuals introducing to manual specialists for treatment. Tension headaches are most typically connected with trigger points in the upper trapezius muscle (Simons, et al.,2005).

In this scenario, referred pain can be felt ascending the neck to the mastoid process and cantering in the lateral wings of the sphenoid bone and behind the eye globes. When cradling a phone or using a pinching action between the neck and shoulder, tension can be felt in the angle of the neck. The presence of both local and transferred pain at the tigger point might cause muscle guarding and a loss of flexibility in the patient. Compensatory mechanisms on the patient's part may result in more injury and the formation of further micro traumas, generating a vicious cycle of trauma, compensation, and more trauma (Kostopoulos, et al.,2008).

Simons (2005) has showed that MTrPs are regularly deficiently analyzed and treated due to insufficient preparing and information on practitioners. MTrPs are indicated to be a source of local and referred pain and make extra objections by decreasing joint range of movement and delivering autonomic disturbance. Patients with MTrPs can give complex clinical findings and the underlying reason for MTrPs has been the subject of much theory (Simons et al., 2005).

A recent precise audit of manual treatments in treatment of MTrPs claimed that there were not many studies that describes treatment of MTrPs utilizing manual treatment (Hanten et al., 2000). As MTrPs are indicated by limited scope of movement of the influenced tissues. Trigger point is the most widely recognized reason for neck pain. Different method is utilized to treat trigger points. Simons (2005) has recommended that proper treatment of MTrPs includes extending the sarcomeres which diminishes the energy consumption and, sequentially, it stops the release of noxious substance. There are various number of components behind the adequacy of trigger point compression and trigger point pressure release. Simons (2005) had suggested that these methods may equalize the length of sarcomeres in the included MTrP, decreasing the palpable bunch and agony. Various study

has demonstrated the advantage of these method for trigger points that is assisted with limiting the neck pain. Clarifications implicating nearby structures, for example, muscle spindles) and end-plates (Kannan, et al., 2002) have been proposed for tender points, identified by myofascial pain condition procedures but it is also likely that peripheral and central pain sensitization may clarify some delicate point pain (Lucus, et al., 2008).

Some distributed papers have recently analyzed the adequacy of trigger point compression procedure in the treatment of either latent or active MTrPs (Gemmel, et al., 2008). The best outcomes in diminishing pain from MTrPs were obtained with profound dept tissue pressure method when contrasted with regular massage (Goldberg, et al.,2011). In another examination, the viability of a home program including ischemic pressure followed by sustained stretching over active MTrPs was inspected (Goldberg, et al.,2011).

The aftereffects of their investigation obviously uncovered that the mix of these strategies was progressively effective in decreasing tenderness from MTrPs. Fryer and Hodgson (2005) have stated that the ischemic pressure procedure was better than sham myofascial strategy in decreasing tenderness on latent MTrPs in the upper trapezius muscle. Different combination of physical helpful modalities of upper active trapezius trigger point and discovered trigger point compression with measured pressure and duration gave immidiate pain releif and decrease of trigger point sensitivity (Hou, et al.,2002).

The home use of trigger point pressure with a "Theracan" self-treatment apparatus followed by continued stretching for trigger points which is situated in the neck and upper back (Hanten, et al.,2002). Dynamic range of movement was utilized as the control and trigger point pressure was seen as predominant in decreasing pain and increasing range of movement. An examination was directed where trigger point pressure and trigger point pressure release on neck pain was performed and the effects were surveyed by a weight algometer, NDI and range of movement using goniometer and was inferred that trigger point pressure is exceptionally viable (Roth, et al.,2017). It deliberately increases nearby blood flow and diminishes the blockage of blood in the trigger point zone. This washes away the metabolic waste items, supplies essential oxygen and causes the influenced tissue to heal decrease pain. Fryer and Hodgson (2005) used a examination group in their research

of 37 asymptomatic subjects with latent upper trapezius trigger points. They saw trigger point pressure release as superior to ischemic pressure. As there was no trigger point pressure gathering and asymptomatic subjects without active upper trapezius trigger point were used. The improvement by pressure release method is that it might cause pain decrease and improve the included myofascial trigger points of trapezius by adjusting the length of the sarcomere of the muscle.

A few examinations have demonstrated that blood supply might be restricted in the area of the myofascial trigger point. The pressure discharge treatment could be powerful when ischemia and hypoxia are removed from the region. Maintaining to keeping up the supported pressure over the myofascial trigger point, ischemia is made and after the release of pressure, an abrupt augmentation in local blood stream was inevitable. Increased blood stream may clean out pain delivering substances from are and stimulation of pain receptors might be decreased as needs be (Kannan, 2012). Pain decreases in MTrPs following MPR may result from reactive hyperemia in the local area to counter irritant impact or a spinal reflex component, likely delivering reflex relaxation of the included muscle (Hou, et al.,2002)

An investigation looked at the adequacy of direct myofascial release procedure with indirect release method in 63 patients with tension type migraine with 24 meetings or sessions. Both the strategies end up being effective in diminishing the pain and recurrence of cerebral pains. The clarification for trigger point pressure discharge being successful is that it works on the rule of Onion metaphor i.e. it starts with net superficial stretching then the specialists hand moves more deeply to the base of the spasm. This causes extensiveness of tissues and efficiency as the tension get diminished, diminishes irritation and stress thus diminishes the pain and increasing the movement and corrects muscle irregularity (Usman, et al., 2019).

CHAPTER – III METHODOLOGY

The research was a quantitative clinical evaluation of the trigger point compression and trigger point pressure release on upper active trapezius trigger point for mechanical neck pain. To identify the effectiveness of these treatment approach numeric pain rating scale (NPRS), neck pain disability index (NDI) was used. Range of motion of cervical spine was also measured by the goniometer.

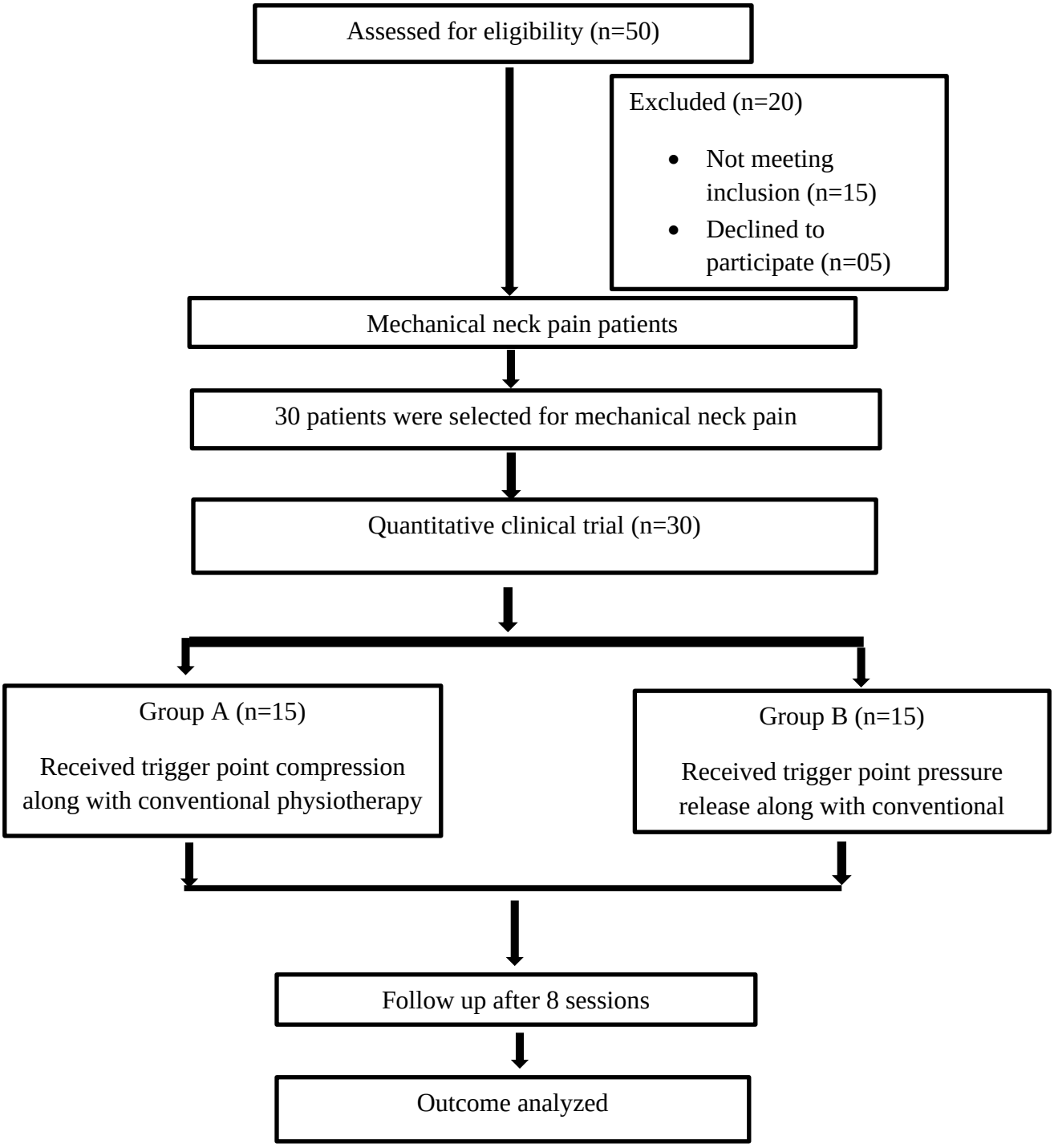
3.1 Study design:

The researcher had chosen clinical trial of this quantitative research. This study design fulfilled the aim and objectives of the research. In this research, both groups were experimental. It did not have control group to compare with the experimental group. Clinical trial was different from true experimental design, although it contained independent variables that are used to look for the effectiveness of dependent variables. This design was useful for the researcher to find out the exact effectiveness and validation of treatment. In experimental study, manipulation, control and randomization are needed but, in this study, they were not present. The total number of patients could be 30 which were divided into two groups. Subjects were divided into two group according to inclusion and exclusion criteria, these groups were trigger point compression along with conventional physiotherapy (Group A, n=15), trigger point pressure release along with conventional physiotherapy (Group B, n=15).

A pre-test (before intervention) and post-test (after intervention) was administered with each subject of both groups to compare the effects on pain, range of motion, and neck disability.

3.2 Flowchart

Flowchart of the phases of Quantitative Clinical Trial



3.3 Study area

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

3.4 Study duration

The data had been collected from October 2020 to March 2021.

3.5 Study Population

A population means the entire group of people or items that meet or fulfill the criteria set by the researcher. The populations of this study were the patients with mechanical neck pain who were attended at musculoskeletal unit at CRP, Savar.

3.6 Sample size:

The researcher had taken 30 participants as sample in this quantitative study. Due to time limitation the researcher had to choose 30 participants to conduct this study; within the short time it could not be possible to conduct the study with a large number subject.

3.7 Sampling technique

In this study, subjects who fulfill the inclusion criteria were selected as sample. At first, fifty participants were taken as sample for this research. But among them thirty participants with mechanical neck pain were fulfilled the inclusion criteria. Those thirty participants were selected for trigger point compression and trigger point pressure release exercise. The samples were given a numerical number of 1, 2, 3…… Total of 30 samples were included in this study.

Single blinding procedure was followed for this study. After completion of sample selection, researcher assigned the participants into trigger point compression group and trigger point pressure release group. The researcher selected the therapist for this study and both treatments were given according to therapist selection.

3.8 Inclusion criteria:

- **Patients who are diagnosed for mechanical neck pain:** Presence of pain between superior nuchal line and imaginary transverse line through the tip of the first thoracic spinous process and laterally by sagittal planes tangential to lateral borders of the neck (Heintz, et al.,2008)
- **Both male and female are included:** Females had a greater global point prevalence of neck discomfort than males (Henschke, et al.,2015). 30% of male and 50% of female had to experience neck pain in their lifetime (Dziedzig, et al.,2005)
- **Subjects who are willingly participate:** Willingness in participation is necessary to conduct a research project.
- **18-60 years of age:** The age range was selected because the prevalence of neck pain mostly depended on age (Gautam, et al., 2014)
- **Had mechanical neck pain for at least 3 months:** Participants who suffered from acute neck pain were included in this study (Hoy, et al., 2014).
- **Had an active upper trapezius trigger point:** An active upper trapezius trigger point is defined as a tender nodule in a taut band that referred pain in a pattern specific for upper trapezius (Gemmell, et al.,2008)
- **Subjects who did not receive drug or other therapies for their neck pain:** Those participants were taken who did not take any type of drugs (diclofenac, naproxen sodium) in the duration of study time. Those participants also included who did not take any physiotherapy treatment before. If that happened, it was very difficult for the researcher to find out the exact cause of current prognosis (Warden, 2010)
- **Patients who are receiving to Physiotherapy from musculoskeletal unit of CRP:** As the study area was at musculoskeletal unit in CRP, Savar, so the researcher had to take those patients who took treatment from there.

3.9 Exclusion criteria:

- **Age below 18 years and above 60 years:** In this age limit, mechanical origin for neck pain was less prevalent (Ummar, et al., 2012)
- **Presence of red flag of neck pain:** Patients who had any pathologies like malignancy, inflammatory arthritis, vascular headache, cervical cord compression, vertebrobasilar insufficiency and referred pain from myocardial infraction were excluded (McColl, 2013).
- **Pathology of the upper cervical region or upper limb:** Participants were excluded if they had referred pain from costo-transverse joint, rotator cuff tendonitis and cervical rib syndrome (El-Sodany, et al., 2014).

3.10 Method of data collection

3.10.1 Data collection tools

A written questionnaire, goniometer, pen and paper used as data collection tools in this study.

3.10.2 Questionnaire

The questionnaire developed under the advice and permission of the supervisor following certain guidelines. There were socio-demographic (name, age, address…. etc.) which was self-made, fifteen close-ended questions of numeric pain rating scale which measured by the examiner and each question will be formulated to identify the change of pain with each activity, ROM measuring section by goniometer, NDI for measuring the outcome of functional activities.

3.11 Measurement tool

3.11.1 Numeric pain rating Scale

Numeric pain rating scale is used for unidimensional measurement of pain intensity in young adults (Childs et al.,2005) McCaffery et al. (1999) used a numeric scale to rate the pain status experienced by patients. It is known as Numeric Pain Rating Scale. The scale is a 10cm long scale ranging from 0-10. Here a zero (0) means no pain, 1-3 indicates mild

pain, 3-5 indicates that pain is in moderate state and 6-10 is worst possible pain feeling experienced by patients. This section of questionnaire will be filled by the patient using a black or blue colored ball pen.

3.11.2 Goniometer

Range of motion was measured by the goniometer in before and after treatment to see the improvement.

3.11.3 Neck pain disability index (NDI)

The Neck Pain Disability Index (NDI) is a widely used, proprietary set of standardized questionnaires used by health professionals to evaluate the condition of patients with mechanical neck pain including pain, stiffness, and physical functioning of the neck. The NDI measures 10 items including pain, personal care (washing, dressing etc), lifting, reading, headaches, concentration, work, driving, sleeping and recreation etc. Each of the 10 sections is scored separately (0 to 5 points) and then added up maximum total 50. the NDI takes approximately 15-20 minutes to complete, and can be taken on paper, over the telephone or computer. Both the computerized and the mobile versions of the test have been found to be comparable to the paper form, with no significant difference. The test questions are scored on a scale of (0-5), which correspond to: (0) None, (1) Mild, (2) Moderate, (3) Fairly severe, (4) very severe and (5) Worst imaginable. If all sections are completed, simply double the patient score. If a section is omitted divide the patient score by the number of sections completed times 5. Higher score of NDI indicates worse pain, stiffness and functional limitation (Vernon, 1991)

3.12 Data collection procedure

The data collection procedure is performed after assessing the patient, initial recording, treatment, and final recording. After screening the patient at department and selection according to inclusion criteria, the patients will be assessed and treated by the qualified physiotherapist. Thirty participants were chosen based on the inclusion criteria and they were given 8 sessions of treatments individually. Among 30 participants, Group A (15) received trigger point compression along with conventional physiotherapy and Group B

(15) received trigger point pressure release along with conventional physiotherapy according to their condition. The evidence-based treatment protocol was applied over the participants by qualified physiotherapist. After 8 sessions, researcher took the posttest results. The participants received treatment as regular patient at musculoskeletal unit and they continued their treatment as their schedule. Before treatment the responsible physiotherapist assessed pain, ROM and also filled up the NDI questionnaire. After 8 sessions, researcher took the post treatment value.

3.13 Data analysis:

Statistical analysis was performed by using statistical package for social science (SPSS) version 20. In this clinical trial study, data was analyzed by both para-metric and non-parametric test in SPSS. Researched performed parametric (paired and unpaired t test) for range of motion and neck pain disability index and non-parametric (Wilcoxon sign rank Z test and Mann-Whitney U test) for numeric pain rating scale.

3.14 Statistical test:

Statistical analysis defines the organization and interpretation of data by doing systemic and mathematical procedures. The socio-demographic portion was analyzed by doing descriptive analysis to see the frequency and percentage of neck pain according to age, sex, education, occupation, working position, accidents, major health problems and treatments. Pain intensity was measured by Wilcoxon sign rank test in within group. In between groups the pain intensity was measured by Mann-Whitney U test. The ROM and NDI were measured by pair t test in within group and in between groups they were measured by unpaired or unrelated or independent sample t test.

3.15 Intervention

Physiotherapies who were expert in treatment of musculoskeletal patient were involved in treatment of patients. All the physiotherapists had the experience of more than two years in the aspect of musculoskeletal physiotherapy. Protocols for conventional physiotherapy were obtained by Head of the Physiotherapy department, CRP (Appendix). In this study two treatment procedure was used. These were trigger point compression and trigger point

release. Both groups received this treatment along with conventional physiotherapy and they received treatment four days weekly in two weeks. Treatment was given by the physiotherapist who were involved in CRP, Savar. Patient was advised to maintain appropriate posture in sitting and lying position.

3.16 Hypothesis test

3.16.1 Wilcoxon sign 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 quantitative clinical trial and had within groups of different subjects, who were selected to trigger point compression exercise and trigger point pressure release exercise and the measurement of the outcome came from collecting Numeric pain rating score, with considering numerical data, range of motion and functional outcome by NDI, 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
- This test was done for within groups

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.

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

Here, W_s = Smallest of absolute values of the sum

n = Total number of samples

Calculation of Wilcoxon sign rank test for general pain intensity as below:

$$Z = \frac{W_s - \frac{n(n+1)}{4}}{\sqrt{\frac{n(n+1)(2n+1)}{24}}} = \frac{0 - \frac{15(15+1)}{4}}{\sqrt{\frac{15(15+1)(2\times15+1)}{24}}} = \frac{59}{\sqrt{\frac{7440}{24}}} = 3.351$$

In this way the researcher calculated the pain intensity that were shown in table 3.1

Table 3.1: Researcher had calculated the value of pain intensity through Wilcoxon test within trigger point compression group and trigger point pressure release group in the following table:

Pain intensity	**Trigger point compression group (n = 15)**		**Trigger point pressure release group (n = 15)**	
	Z	**P**	**Z**	**P**
Severity of today's pain	3.351	.001*	1.811	.070
Severity of pain during neck rotation	2.309	.021*	2.646	.008*
Severity of pain during sitting	2.810	.005*	.812	.417
Severity of pain during sleeping	3.125	.002*	2.271	.023
Severity of pain during reading	2.530	.011*	1.633	.102

Table 3.1: Researcher had calculated the value of pain intensity through Wilcoxon test within trigger point compression group and trigger point pressure release group in the following table:

Pain intensity	**Trigger point compression group (n = 15)**		**Trigger point pressure release group (n = 15)**	
	Z	**P**	**Z**	**P**
Severity of pain during daily activities	3.000	0.003*	0.649	.516
Severity of pain during household activities	3.207	0.001*	0.333	.739
Severity of pain during standing	2.326	0.020*	1.613	.107
Severity of pain during walking	2.810	0.005*	1.000	.317
Severity of pain during playing	2.060	0.039*	1.089	.276
Severity of pain during resting	2.310	0.021*	2.359	.018*

Table 3.1: Researcher had calculated the value of pain intensity through Wilcoxon test within trigger point compression group and trigger point pressure release group in the following table:

Pain intensity	**Trigger point compression group (n = 15)**		**Trigger point pressure release group (n = 15)**	
	Z	**P**	**Z**	**P**
Severity of pain during self-care activities	2.652	0.008*	1.995	.046*
Severity of pain in carrying heavy loads	2.814	0.005*	1.134	.257
Severity of pain in using mobile or computer	2.070	0.038*	.577	.564
Severity of pain during travelling	2.460	0.014*	1.730	.084

3.16.2 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. This test can only be used with ordinal or interval/ ratio data.

Assumption

- All the observation from both groups were independent with each other
- The responses were ordinal
- Under the null hypothesis, the distribution of both groups was equal
- This test was done for between groups

The formula of Mann-Whitney U test:

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

Here,

n_1 = number of subjects from experimental group.

n_2 = number of subjects from control group.

T_x = the larger rank total.

n_x = the number of the subjects of the group with larger

Mann-Whitney U 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.

Calculating the formula of Mann-Whitney U test:

$$U = n_1 n_2 + \frac{n_x(n+1)}{2} - T_x = 15 \times 15 + \frac{15\,(15+1)}{2} - 285 = 345 - 285 = 60$$

In this way the researcher calculated the pain intensity in between groups that were shown in table 3.2

Table 3.2: Researcher had calculated the value of pain intensity through Mann-Whitney U test in between trigger point compression and trigger point pressure release group in the following table:

Numeric Pain Rating Scale	**Trigger point compression group (n =30) X ± SD**	**Trigger point pressure release group (n = 30) X ± SD**	**Z**	**P**	**U**
Severity of today's pain	2.53 ± .640	3.13 ± .640	2.384	0.017*	60
Severity of pain during neck rotation	2.60 ± .737	2.33 ± .900	.447	0.655	102
Severity of pain during sitting	2.60 ± .507	2.80 ± 1.014	.879	0.379	93

Table 3.2: Researcher had calculated the value of pain intensity through Mann-Whitney U test in between trigger point compression and trigger point pressure release group in the following table:

Numeric Pain Rating Scale	**Trigger point compression group (n =30) X ± SD**	**Trigger point pressure release group (n = 30) X ± SD**	**Z**	**P**	**U**
Severity of pain during sleeping	2.07 ± 1.033	2.67 ± .900	1.625	0.104	75
Severity of pain during reading	1.93 ± .961	1.20± .414	2.251	0.024*	66
Severity of pain during daily activities	2.27 ± .704	3.00 ± 1.000	1.004	0.018*	58
Severity of pain during household activities	2.27 ± .594	2.73 ± 1.100	1.532	0.125	77
Severity of pain during standing	1.87 ± .834	2.13 ± 1.060	.612	0.541	98

Table 3.2: Researcher had calculated the value of pain intensity through Mann-Whitney U test in between trigger point compression and trigger point pressure release group in the following table:

Numeric Pain Rating Scale	**Trigger point compression group (n =30) X ± SD**	**Trigger point pressure release group (n = 30) X ± SD**	**Z**	**P**	**U**
Severity of pain during walking	1.67 ± .816	2.27 ± 1.163	1.450	0.147	79
Severity of pain during playing	1.20 ± .414	1.27 ± .799	.384	0.701	106
Severity of pain during resting	1.87 ± .990	2.40 ± 1.183	1.279	0.201	83
Severity of pain during self-care activities	1.93± .884	2.20 ± 1.265	.329	0.743	105
Severity of pain in carrying heavy loads	2.40± .737	2.87 ± .834	2.005	0.045*	68
Severity of pain in using mobile or computer	2.07 ± 1.033	1.47± .990	2.054	0.040*	68
Severity of pain during travelling	1.73 ± .704	1.93 ± 1.033	.355	0.723	104

3.16.3 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.
- This test was done for within group

Formula: test statistic t is follows:

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

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

Paired-t 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.

Calculating the formula of pair t test in range of motion in:

$$t = \frac{\bar{d}}{SE\ (\bar{d})} = \frac{\bar{d}}{\frac{SD}{\sqrt{n}}} = \frac{.867}{\frac{.516}{\sqrt{15}}} = \frac{.867}{\frac{.516}{3.872}} = \frac{.867}{0.1332} = 6.509$$

Calculating the formula of pair t test of NDI:

$$t = \frac{\bar{d}}{SE\ (\bar{d})} = \frac{\bar{d}}{\frac{SD}{\sqrt{n}}} = \frac{7.233}{\frac{2.513}{\sqrt{15}}} = \frac{7.233}{\frac{2.513}{3.872}} = \frac{7.233}{0.6490} = 11.144$$

In this way, researcher calculated the ROM and NDI that were shown in table 3.3 and 3.4

Table 3.3: Researcher had calculated the value of range of motion through pair-t test in between trigger point compression and trigger point pressure release group in the following table:

		Trigger point compression			Trigger point pressure release		
Serial no.	**Variables**	**t**	**df**	**Sig-2 tailed**	**t**	**df**	**Sig-2 tailed**
1	Flexion	6.500	14	.000*	4.000	14	.001*
2	Extension	9.539	14	.000*	6.205	14	.000*
3	Right side rotation	16.000	14	.000*	5.292	14	.000*
4	Left side rotation	16.000	14	.000*	5.292	14	.000*
5	Right side bending	14.000	14	.000*	10.247	14	.000*
6	Left side bending	14.000	14	.000*	14.000	14	.000*

Table 3.4: Researcher had calculated value of neck pain disability index through pair-t test in within trigger point compression and trigger point pressure release group in the following table:

	Trigger point compression			Trigger point pressure release		
Serial no	**t**	**df**	**Sig-2 tailed**	**t**	**df**	**Sig-2 tailed**
Pair 1	11.147	14	.000*	4.703	14	.000*

3.15.4 Unrelated t test

Unrelated 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
- This test was done for between groups

Formula: test statistic t is follows:

$$t = \frac{\bar{x}1 - \bar{x}2}{\sqrt{\frac{\in x1^2 - \frac{(\epsilon x1)2}{n1} + \epsilon x2^2 - \frac{(\epsilon x2)2}{n2}}{(n1-1)+(n2-1)}} \times \sqrt{\frac{1}{n1} + \frac{1}{n2}}}$$

Where,

$\bar{x}1$ = Mean of the trigger point compression group, $\bar{x}2$ = Mean of the trigger point pressure release group, $n1$ = Number of participants in the trigger point compression group, $n2$ = Number of participants in the trigger point pressure release group, **x1=** individual value of the trigger point compression group, **x2**= individual value of the trigger point pressure release group

Unrelated-t 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.

Calculation for unrelated t value for range of motion:

$$t = \frac{\bar{x}1 - \bar{x}2}{\sqrt{\frac{\in x1^2 - \frac{(\epsilon x1)2}{n1} + \epsilon x2^2 - \frac{(\epsilon x2)2}{n2}}{(n1-1)+(n2-1)}} \times \sqrt{\frac{1}{n1} + \frac{1}{n2}}}$$

$$= \frac{40.66 - 36.66}{\sqrt{\frac{25580 - \frac{372100}{15} + 20660 - \frac{302500}{15}}{(15-1)+(15-1)}} \times \sqrt{\frac{1}{15} + \frac{1}{15}}}$$

$$= \frac{4}{\sqrt{\frac{773.33+493.33}{28}} \times 0.133}$$

$$= 1.629$$

In this way, researcher calculated the ROM and NDI that were shown in table 3.5 and 3.6

Table 3.5: Researcher had calculated the value of range of motion through unrelated-t test in between trigger point compression and trigger point pressure release group in the following table:

Variables	**Unrelated-t test**		
	t	df	Sig-2 tailed
Flexion	1.629	28	.077
Extension	1.795	28	.083
Right side rotation	.173	28	.864
Left side rotation	.509	28	.615
Right side bending	1.000	28	.326
Left side bending	.784	28	.439

Table 3.6: Researcher had calculated the value of neck pain disability index through unrelated-t test in between trigger point compression and trigger point pressure release group in the following table:

	Unrelated-t test		
Variables	**t**	**df**	**Sig-2 tailed**
Total NDI score	2.830	28	.009

3.16 Significant level

Here, the researcher calculated the “p” value to find out the significance of the study. The “p” values refer to the probability of the results for the experimental study. Probability means the accuracy of the findings. A “p” value is called the level of significance for an experiment study and for health service research a “p” value of <0.05 was accepted as a significant result. If the p-value is equal or smaller than the significant levels, the results are considered as significant.

3.17 Elimination of confounding variables

Confounding variable influenced the study variables which can affect the result of the study. There were some confounding variables in this study such as patient’s age, history of taking recent physiotherapy intervention, oral NSAID, steroid injection or other treatment which could influence the result of the study. To control the confounding variables, the researcher set the inclusion criteria as to include only those subjects who had no history of taking recent physiotherapy intervention, oral NSAID, steroid injection or other treatment, pathological condition, recent surgery or trauma.

3.18 Informed consent

It is vital to obtain consent from the subjects before doing research with them. Every participant was given a consent form for this study, and the aim of the research and consent forms were verbally explained to them. Participants were totally voluntary, according to the researcher, and they had the right to withdraw at any time. The researcher assured them that their privacy would be respected. Information may have been published in the form of a presentation or a written document, but it was not identified. Although the study's findings may not have any direct implications for them, members of the physiotherapy population may benefit from it in the future.

3.19 Ethical consideration

The research proposal was submitted for approval to the administrative bodies of the ethical committee of CRP and had followed the Bangladesh Medical Research guideline (BMRC) and the World Health Organization (WHO) guideline. Again, before data collection, permission from the Ethical Committee of Bangladesh Health Professions Institute (BHPI) took and a requested letter hand over to the appropriate authority of the study area for taking permission and seeking assistance for smooth access to data collection with insurance of patient's safety. In order to eliminate ethical claims, the participants were set free to receive treatment for other purposes as usual. Each participant was informed about the study before beginning and given written consent. The researcher received verbal and signed an informed consent form to participate in this study from every subject. The participants were informed that they have the right to meet with an outdoor doctor if they think that the treatment is not enough to control the condition or if the condition becomes worse. The participants were also informed that they were completely free to decline to answer any question during the study and were free to withdraw their consent and terminate participation at any time. If the patient wants to withdraw herself from the study, it would not affect their treatment in the physiotherapy department and they would still get the same facilities. Every subject had the opportunity to discuss their problem with the senior authority or administration of CRP and have any questioned answer to their satisfaction.

CHAPTER – IV RESULTS

Socio-demographic Information (Table-4.1)

	Trigger point compression		Trigger point pressure release	
	Mean with SD	Min-Max	Mean with SD	Min-Max
Age	39.20 ± 9.645	23-55	38.07 ± 10.925	22-60
Gender	1.60 ± .507	1-2	1.47±.516	1-2
Marital status	1.07± .258	1-2	1.00±.000	1-1
Education	4.67 ± 2.501	1-9	3.33±1.113	2-6
Occupation	7.13 ± 3.482	1-13	6.95±3.288	2-13
Working types	3.00± 1.690	1-5	2.87±1.356	1-5
Major working position	1.73 ± 1.63	1-5	1.47±.915	1-4
Chronic illness	3.61 ± 2.380	1-5	2.29±.924	1-3
Accident history	2.53 ± 1.407	1-10	2.07±.799	1-4
Treatment	1.73 ± 1.033	1-4	1.47±.743	1-3

Age: The table revels that among the 30 participants the mean age of the participants between trigger point compression and trigger point release were 39.20 ± 9.645 and 38.07 ± 10.925 years with a range from 18 to 60 years and the minimum age of compression group was 23 years and maximum was 55 years. Again, the minimum age of pressure release group was 22 years and maximum were 60 years.

Sex of the participants: The mean gender of trigger point compression group and trigger point release group were 1.60 ± .507 and 1.47±.516. On this study, fourteen participants were male, and sixteen participants were female. The percentage of male and female was 46.7% and 53.3%.

Marital Status: The mean marital status trigger point compression group and trigger point release group were 1.07± .258 and 1.47±.516. In this study, about 96.7% participants were married and 3.3% were unmarried.

Educational and occupational status: The mean of educational and occupational status in both groups were 4.67 ± 2.501, 3.33±1.113, 7.13 ± 3.482 and 6.95±3.288. Here among 30 participants, 33.3% were SSC completed, 16.7% were HSC completed, 13.3% were graduated, 6.7% were masters, 3.3% were diploma and 6.7% were degree completed, 16.7% were primary completed and about 3.3% participants were illiterate and 40% were housewife, 13.3% were businessman, 10% were government worker and 10% were unemployed, 3.3% were in non-government service 6.7% were teacher and 16.7% were in other occupation (such as, student, farmer, day laborer)

Working type and main working position: The mean of working type and working position in both groups were 7.13 ± 3.482, 6.95±3.288, 1.73 ± 1.63 and 1.47±.915. In this study, 40% of the participants were done household chores, 26.7% were done desk job, 6.7% were worked as a day laborer and lastly 26.7% were worked in other types. In this study, 66.7% of the participants were worked in sitting position, 16.7% participants were worked in standing position, 10% participants were worked in walking position, 6.7% participants were worked in extended neck and transitional position.

Accident history, chronic illness and treatment: The mean of accident history, chronic illness and treatment in both groups were 3.61 ± 2.380, 2.29±.924, 2.53 ± 1.407, 2.07±.799, 1.73 ± 1.033 and 1.47±.743. Among 30 participants, 20% had diabetes, 36.7% had hypertension, 23.3% had heart disease, 10% had osteoarthritis, 6.7% had other disease and 3.3% had no chronic illness. Among 30 participants, 23.3% (seven participants) had direct traumatic history, 43.3% (about thirteen participants) had history of trauma due to overload, 23.3% (seven participants) had history of micro trauma,10% (around three participants) had no history of trauma. Among 30 participants, 60% had taken medical treatment, 26.7% had taken physiotherapy treatment, 6.7% had taken traditional healer and 6.7% had taken painkiller.

4.2 Numeric Pain Rating Scale (NPRS)

4.2.1 General pain intensity

In this study, researcher found that the observed p value was .001 and z value was 3.351 in trigger point compression group and the observed p value was .070 and Z value was 1.811. So, in within group analysis the result showed significant improvement ($p<0.05$) in trigger point compression group which meant the alternative hypothesis was accepted and null hypothesis was rejected.

In between group analysis the observed p value for general pain intensity was .017 and Z value was 2.384. This result showed significant improvement ($P>0.05$). Both groups showed significant improvement for general pain intensity but the Z value was greater in trigger point compression group (within group analysis) which meant this group showed more significant improvement than trigger point pressure release group.

4.2.2 Pain during neck rotation

In within group analysis, the observed p and z value was .021, 3.357 in trigger point compression group and in trigger point pressure release group, the observed P and Z value was .008, 2.646. This result showed significant improvement ($p<0.05$) which meant alternative hypothesis was accepted and null hypothesis was rejected.

Subjects of between groups who took both trigger point compression and release treatment in pre and post session (total 8 sessions) didn't show any significant improvement where the rate of p value was .665 and Z value was .447. The significant level and z value was higher in trigger point compression group (within group analysis). So Trp compression was more effective than Trp pressure release.

4.2.3 Pain during sitting

In within group analysis, the observed p and z value was .005, 2.810 in trigger point compression group and in trigger point pressure release group, the observed P and Z value was .417, .812. This result showed significant improvement ($p<0.05$) which meant alternative hypothesis was accepted for trigger point compression group.

Subjects of between groups who took both trigger point compression and release treatment in pre and post session didn't show any significant improvement where the rate of p value was .379 and z value was .879. The significant level and Z value was higher in trigger point compression group (within group analysis). So Trp compression was more effective than Trp pressure release.

4.2.4 Pain during sleeping

In within group analysis, the observed P and Z value was .002, 3.125 in trigger point compression group and in trigger point pressure release group, the observed P and Z value was .023, 2.271. This result showed significant improvement ($p<0.05$) which meant alternative hypothesis was accepted and null hypothesis was rejected.

Subjects of between groups who took both trigger point compression and release treatment in pre and post session didn't show any significant improvement where the rate of p value was .104 and z value was 1.625

The significant level and Z value was higher in trigger point compression group (within group analysis). So Trp compression was more effective than Trp pressure release.

4.2.5 Pain during reading

In within group analysis, the observed P and Z value was .011, 2.503 in trigger point compression group and in trigger point pressure release group, the observed P and Z value was .102, 1.633. This result showed significant improvement ($p<0.05$) which meant alternative hypothesis was accepted for trigger point compression group

Subjects of between groups who took both trigger point compression and release treatment in pre and post session showed significant improvement where the rate of p value was .028 and z value was 2.251. So, in between group both were showed significant improvement ($p<0.05$)

But the Z value was higher in trigger point compression group than trigger point pressure release group (within group analysis). So, trigger point compression was more effective.

4.2.6 Pain during daily activities

In within group analysis, the observed P and Z value was .003, 3.000 in trigger point compression group and in trigger point pressure release group, the observed P and Z value was .516, .649. This result showed significant improvement ($p<0.05$) which meant alternative hypothesis was accepted for trigger point compression group

Subjects of between groups who took both trigger point compression and release treatment in pre and post session (total 8 sessions) showed significant improvement where the rate of p value was .018 and the z value was 1.004. So, in between group both were showed significant improvement ($p<0.05$)

But the Z value was higher in trigger point compression group than trigger point pressure release group (within group analysis). So, trigger point compression was more effective.

4.2.7 Pain during daily household chores

In within group analysis, the observed P and Z value was .001, 3.207 in trigger point compression group and in trigger point pressure release group, the observed P and Z value was .739, .333. This result showed significant improvement ($p<0.05$) which meant alternative hypothesis was accepted for trigger point compression group

Subjects of between groups who took both trigger point compression and release treatment in pre and post session didn't show any significant improvement where the rate of p value was .125 and z value was 1.532.

The significant level and Z value was higher in trigger point compression group (within group analysis). So Trp compression was more effective than Trp pressure release.

4.2.8 Pain during daily standing

In within group analysis, the observed P and Z value was .020, 2.326 in trigger point compression group and in trigger point pressure release group, the observed P and Z value was .107, 1.613. This result showed significant improvement ($p<0.05$) which meant alternative hypothesis was accepted for trigger point compression group

Subjects of between groups who took both trigger point compression and release treatment in pre and post session didn't show any significant improvement where the rate of p value was .541 and z value was .612.

The significant level and Z value was higher in trigger point compression group (within group analysis). So Trp compression was more effective than Trp pressure release.

4.2.9 Pain during daily walking

In within group analysis, the observed P and Z value was .005, 2.810 in trigger point compression group and in trigger point pressure release group, the observed P and Z value was .317, 1.000. This result showed significant improvement ($p<0.05$) which meant alternative hypothesis was accepted for trigger point compression group

Subjects of between groups who took both trigger point compression and release treatment in pre and post session didn't show any significant improvement where the rate of p value was .147 and z value was 1.450

The significant level and Z value was higher in trigger point compression group (within group analysis). So Trp compression was more effective than Trp pressure release**.**

4.2.10 Pain during daily playing

In within group analysis, the observed P and Z value was .039, 2.060 in trigger point compression group and in trigger point pressure release group, the observed P and Z value was .276, 1.089. This result showed significant improvement ($p<0.05$) which meant alternative hypothesis was accepted for trigger point compression group

Subjects of between groups who took both trigger point compression and release treatment in pre and post session didn't show any significant improvement where the rate of p value was .701 and z value was .384

The significant level and Z value was higher in trigger point compression group (within group analysis). So Trp compression was more effective than Trp pressure release.

4.2.11 Pain during daily resting

In within group analysis, the observed P and Z value was .021, 2.310 in trigger point compression group and in trigger point pressure release group, the observed P and Z value was .018, 2.359. This result showed significant improvement ($p<0.05$) which meant alternative hypothesis was accepted for trigger point compression group

Subjects of between groups who took both trigger point compression and release treatment in pre and post session didn't show any significant improvement where the rate of p value was .201 and z value was 1.279

The significant level and Z value was higher in trigger point compression group (within group analysis). So Trp compression was more effective than Trp pressure release.

4.2.12 Pain during daily self-care activities

In within group analysis, the observed P and Z value was .008, 2.652 in trigger point compression group and in trigger point pressure release group, the observed P and Z value was .046, 1.995. This result showed significant improvement ($p<0.05$) which meant alternative hypothesis was accepted and null hypothesis was rejected.

Subjects of between groups who took both trigger point compression and release treatment in pre and post session didn't show any significant improvement where the rate of p value was .743 and z value was .329

The significant level and Z value was higher in trigger point compression group (within group analysis). So Trp compression was more effective than Trp pressure release.

4.2.13 Pain during carrying heavy loads

In within group analysis, the observed P and Z value was .005, 2.814 in trigger point compression group and in trigger point pressure release group, the observed P and Z value was .257, 1.134. This result showed significant improvement ($p<0.05$) which meant alternative hypothesis was accepted for trigger point compression group

Subjects of between groups who took both trigger point compression and release treatment in pre and post session didn't show any significant improvement where the rate of p value was .045 and z value was 2.005

So, in between group both were showed significant improvement ($p<0.05$)

But the Z value was higher in trigger point compression group than trigger point pressure release group (within group analysis). So, trigger point compression was more effective.

4.2.14 Pain for using mobile phone or computer

In within group analysis, the observed P and Z value was .038, 2.070 in trigger point compression group and in trigger point pressure release group, the observed P and Z value was .564, .577. This result showed significant improvement ($p<0.05$) which meant alternative hypothesis was accepted for trigger point compression group

Subjects of between groups who took both trigger point compression and release treatment in pre and post session didn't show any significant improvement where the rate of p value was .040 and z value was 2.054

So, in between group both were showed significant improvement ($p<0.05$)

But the Z value was higher in trigger point compression group than trigger point pressure release group (within group analysis). So, trigger point compression was more effective.

4.2.15 Pain during travelling

In within group analysis, the observed P and Z value was .014, 2.460 in trigger point compression group and in trigger point pressure release group, the observed P and Z value was .084, 1.730. This result showed significant improvement ($p<0.05$) which meant alternative hypothesis was accepted for trigger point compression group

Subjects of between groups who took both trigger point compression and release treatment in pre and post session didn't show any significant improvement where the rate of p value was .723 and z value was .355

The significant level and Z value was higher in trigger point compression group (within group analysis). So Trp compression was more effective than Trp pressure release.

As the trigger point compression group showed much improvement for pain so researcher decided that Trp compression was superior than Trp pressure release.

4.3 Range of Motion

Researcher measured the cervical ROM of within group by pair-t test. In individual group (trigger point compression and trigger point pressure release), there were 6 pairs, where the number of degree of freedom was 14. The rate of p value was .000 in all pairs of this individual group except the pair 1 of trigger point pressure release group where the rate of p value was.001. This rate of p value was <0.05 after giving 8 session of treatment, which means the result was significant. The treatment helped to increase the ROM. The table t value for 14 degree of freedom was 1.7613 (according to t table) but the observed t value was higher than table t value. So, the alternative hypothesis was accepted and null hypothesis was rejected in within group analysis.

Researcher measured the cervical ROM of between groups by unrelated-t test, where the degree of freedom was 28.

Flexion: Subjects who received trigger point compression and trigger point pressure release didn't show any significant improvement where the value of df= 28, t= 0.446 (initial), p= 0.40 (initial) and t= 1.629 (final), p= .007(final)

Extension: Subjects who received trigger point compression and trigger point pressure release didn't show any significant improvement where the value of df= 28, t= 1.249 (initial), p= .222 (initial) and t= 1.795 (final), p= .083(final)

Right side rotation: Subjects who received trigger point compression and trigger point pressure release didn't show any significant improvement where the value of df= 28, t= 1.052 (initial), p= .302 (initial) and t= .173 (final), p= .864 (final)

Left side rotation: Subjects who received trigger point compression and trigger point pressure release didn't show any significant improvement where the value of df= 28, t= 1.363 (initial), p= .184 (initial) and t= .509 (final), p= .615 (final)

Right side bending: Subjects who received trigger point compression and trigger point pressure release didn't show any significant improvement where the value of df= 28, t= 1.143 (initial), p= .263 (initial) and t= 1.000 (initial), p= .326 (final)

Left side bending: Subjects who received trigger point compression and trigger point pressure release didn't show any significant improvement where the value of df= 28, t= 1.099 (initial), p= .281 (initial) and t= .784 (final), p= .439 (final)

In between group analysis, the result was not significant ($p<0.05$). The Unrelated/independent t test in between group at 5% level of significant and 28 degrees of freedom standard table value was 1.7011 (according to t table). So, the observed t value was less than the table value that means null hypothesis was accepted and alternative hypothesis was rejected which means; there was no difference between trigger point compression and trigger point pressure release technique for range of motion.

Neck Pain Disability Index

Researcher measured the percentage of NDI within group by pair-t test. In individual group (trigger point compression and trigger point pressure release), there was 1 pair, where the number of degrees of freedom was 14.

The rate of p value was .000 in both individual group which is <0.05, that means the result showed significant improvement after giving 8 session of treatment. In within group analysis, the result was not significant ($p<0.05$). The pair t test in within group at 5% level of significant and 14 degrees of freedom standard table value was 1.761 (according to t table). So, the observed t value was higher (t= 11.147 (Trp compression group), t=4.703 (Trp pressure release group) than the table value that means alternative hypothesis was accepted and null hypothesis was rejected which means; there was significant improvement in functional outcome of neck.

Researcher calculated the value of NDI of between groups by unrelated-t test. Where df= 28. From table-3.6 researcher had found that the value of p=.009 which is <0.05. That means the result showed significant improvement in between groups after taking trigger point compression and trigger point pressure for about 8 sessions. The unrelated t test in between group at 5% level of significant and 28 degrees of freedom standard table value was 1.7011 (according to t table). So, the observed t value was higher (t=2.830) than the table t value that means alternative hypothesis was accepted and null hypothesis was rejected which means there was significant improvement in functional outcome of neck.

CHAPTER – V DISCUSSION

The purpose of this study was to find out the effectiveness among the treatment that was used in this research. Mechanical neck pain is very common condition among young adults. Most of the time it is caused by trigger points on trapezius muscle. In this research, trigger point compression and trigger point pressure release approaches were used to treat trigger points. To evaluate the pain intensity and functional outcome, specific questionnaire was used. In this quantitative clinical trial study, 30 patients with mechanical neck pain took trigger point compression and pressure release treatment in pretest and posttest way. They were attended almost 8 sessions (4 days per week) at musculoskeletal unit, CRP, Savar. The numeric pain rating scale (NPRS), neck pain disability index scale (NDI) was used to measure the outcome of pain intensity and functional improvement by taking pretest and posttest score.

Numeric pain rating scale (NPRS)

From table-3.1 researcher found that the pain intensity (in neck rotation, sitting, standing, walking, resting, playing, carrying heavy loads, sleeping, daily works, household activities, using mobile phone and travelling) were reduced in trigger point compression group by giving 8 sessions of treatment by doing Wilcoxon sign rank test. The p value was significant (<0.05).

From table-3.2 researcher also found that the pain was reduced in neck rotation, resting and self-care activities in trigger point pressure release group where p value was <0.05.

Researcher had calculated post-treatment's value of pain intensity through Mann-Whitney U test in between trigger point compression and trigger point pressure release group. From table-3.2 researcher found that there was no significant improvement in reduction of pain including neck rotation, sitting, standing, walking, resting, playing, carrying heavy loads, sleeping, daily works, household activities, using mobile phone and travelling. As the significant level was higher in trigger point compression group, so researcher found that trigger point compression was more effective than trigger point pressure release.

According to gemmel, et al.,2008, they did research on trigger points of mechanical neck pain. 45 participants were enrolled for that study. They measured the pain intensity on

VAS. They found that the significant improvement of pain reduction in within group. But the between groups analysis, there was no significant improvement.

In contrast, the current study outcomes of patient rated general pain intensity was similar as Gemmel and their colleague's study.

Range of motion (ROM)

Researcher had calculated the range of motion of within group by pair-t test. All six pairs of trigger point pressure group including flexion, extension, side rotation (right and left), side bending (right and left) showed significant improvement after 8 sessions of pretest and posttest. Where the value of p was <0.05 (from table-3.3)

From table-3.3 researcher also found that the trigger point pressure release group showed significant improvement in range of motion section including flexion, extension, side rotation (right and left), side bending (right and left).

Conventional physiotherapy as an effective treatment for patients with chronic neck pain was found in different study (Sambyal and Kumar, 2013). In contrast, few numbers of studies (Naz and Sarfraz, 2012) established cranio-cervical exercise was an effective treatment to reduce pain and improve ROM among patients with chronic neck pain. The current study showed significant improvement in increasing ROM. In compare with Gupta and their colleague's there was no difference with current study. Treatments were effective in within group analysis.

Researcher had calculated the value of range of motion through unrelated-t test in between trigger point compression and trigger point pressure release group. But in between group there was no significant improvement (from table 3.4).

As there was no significant improvement in ROM, so there was no difference in between groups. Both treatments were effective for increasing ROM.

Neck pain disability index (NDI)

Researcher had calculated value of neck pain disability index through pair-t test in within trigger point compression and trigger point pressure release group after giving 8 sessions of pretest-posttest treatment. It showed significant improvement (from table 8) where the p value was <0.05. Researcher had calculated the value of neck pain disability index through unrelated-t test in between trigger point compression and trigger point pressure release group after giving 8 sessions of pretest-posttest treatment. It also showed significant improvement where p value was <0.05. Both treatments were effective in improving the functional outcome. Overall, the patient treated with trigger point compression had five times greater chance of improvement than trigger point release group. According to Gemmell, 2008 there was no statistically significant improvement between groups (ischemic compression and trigger point pressure release) in their article.

According to Fryer and Hodgson, 2005 they used 37 asymptomatic subjects to do the study about ischemic compression and trigger point pressure release. They wanted to find out the effectiveness. They found that trigger point pressure release was superior to ischemic compression. In this study it was found that trigger point compression is effective for upper active trapezius trigger point than trigger point pressure release technique for mechanical neck pain.

Limitation of the Study:

In Bangladesh, this treatment (trigger point compression and trigger point pressure release) related research work was performed for the first time, so there were some limitations and barriers during conducting the research project. First, short study period was the main limiting factor of this study. Here the participant gets only 8 weeks' treatment sessions due to lack of time limitation. This is the reason behind not exploring the effect of trigger point compression and trigger point pressure release for mechanical neck pain. Secondly the sample size was not sufficient due to short period of the study. Fourth, the researcher took participants of both acute and chronic mechanical neck pain which also influence the study. It is limited by the fact all daily activities of the subject were not monitored which could have influenced.

CHAPTER – VI CONCLUSION AND RECOMMENDATION

Conclusion

This study consisted of 30 participants, they were undergoing all physical, medical examination, also medical report if available from which their diagnosis of mechanical neck pain was made. All participants received 8 sessions of treatment.

In NPRS, the trigger point compression group showed significant improvement in all aspects including neck rotation, sitting, standing, walking, resting, playing, carrying heavy loads, sleeping, daily works, household activities, using mobile phone and travelling. Though trigger point pressure release group showed significant improvement in reading and self-care activities, but the maximum improvement was in trigger point compression group. In ROM, both treatment techniques helped to increase the cervical range of motion but Trp compression was more effective than TrP pressure release. In neck pain disability index part, though both groups showed significant improvements, but trigger point compression was superior to trigger point release in treating the mechanical neck pain patients.

Recommendation

This study directed towards an assessment of the specific management in treating neck of specific neck problem in an outpatient, if pursued further could prove extremely fruitful. The samples were selected between the age group of 18-60 years, but the researcher could not find out which age group was more effective. If the most effective age group were found then the study will be more effective. A double blinded trial was recommended with larger sample to see the better effectiveness of the treatment. That's why researcher recommended to do further study with enough time and by maintaining random selection to make the study more valid.

REFERENCES

Bonica, J.J., (1957). Management of myofascial pain syndromes in general practice. *Journal of the American Medical Association*, 164(7):732-738.

Chaitow, L. and Crenshaw, K., (2006). Muscle energy techniques, 2nd ed., Edinburgh: *Elsevier Health Sciences*.

Childs, J.D., Cleland, J.A., Elliott, J.M., Teyhen, D.S., Wainner, R.S., Whitman, J.M., Sopky, B.J., Godges, J.J., Flynn, T.W., Delitto, A. and Dyriw, G.M., (2008). Neck pain: clinical practice guidelines linked to the International Classification of Functioning, Disability, and Health from the Orthopaedic Section of the American Physical Therapy Association. *Journal of Orthopaedic & Sports Physical Therapy*, 38(9):A1-A34.

Cagnie, B., Castelein, B., Pollie, F., Steelant, L., Verhoeyen, H. and Cools, A., (2015). Evidence for the use of ischemic compression and dry needling in the management of trigger points of the upper trapezius in patients with neck pain: a systematic review. *American journal of physical medicine & rehabilitation*, 94(7):573-583.

Dziedzic, K., Hill, J., Lewis, M., Sim, J., Daniels, J. and Hay, E.M., (2005). Effectiveness of manual therapy or pulsed shortwave diathermy in addition to advice and exercise for neck disorders: a pragmatic randomized controlled trial in physical therapy clinics. Arthritis Care & Research: *Official Journal of the American College of Rheumatology*, 53(2):214-222.

Desai, M.J., Saini, V. and Saini, S., (2013). Myofascial pain syndrome: a treatment review. *Pain and therapy*, 2(1):21-36.

Durall, C.J., (2012). Therapeutic exercise for athletes with nonspecific neck pain: a current concepts review. *Sports Health*, 4(4):293-301.

El-Metwally, A., Salminen, J.J., Auvinen, A., Macfarlane, G. and Mikkelsson, M., (2007). Risk factors for development of non-specific musculoskeletal pain in preteens and early adolescents: prospective 1-year follow-up study. *BMC musculoskeletal disorders*, 8(1):1-8.

El-Sodany, A. M., Alayat, M. S. M. and Zafer, A. M. I. (2014). Sustained natural apophyseal glides mobilization versus manipulation in the treatment of cervical spine disorders: a randomized controlled trial. *International Journal of Advanced Research*, 2 (6):274- 280.

Fernandez-de-las-Penas, C., Alonso-Blanco, C. and Miangolarra, J.C., (2007). Myofascial trigger points in subjects presenting with mechanical neck pain: a blinded, controlled study. *Manual therapy*, 12(1):29-33.

Falla, D., Lindstrøm, R., Rechter, L., Boudreau, S. and Petzke, F., (2013). Effectiveness of an 8-week exercise programme on pain and specificity of neck muscle activity in patients with chronic neck pain: A randomized controlled study. *European Journal of Pain*, 17(10):1517-1528.

Guez, M., Hildingsson, C., Nilsson, M. and Toolanen, G., (2002). The prevalence of neck pain. *Acta Orthopaedica Scandinavica*, 73(4):455-459.

Goldberg, D.S. and McGee, S.J., (2011). Pain as a global public health priority. *BMC public health*, 11(1):1-5.

Gupta, B.D., Aggarwal, S., Gupta, B., Gupta, M. and Gupta, N., (2013). Effect of deep cervical flexor training vs. conventional isometric training on forward head posture, pain, neck disability index in dentists suffering from chronic neck pain. *Journal of clinical and diagnostic research: JCDR*, 7(10):2261.

Ganesh, G.S., Mohanty, P., Pattnaik, M. and Mishra, C., (2015). Effectiveness of mobilization therapy and exercises in mechanical neck pain. *Physiotherapy theory and practice*, 31(2):99-106.

Gemmell, H., Miller, P. and Nordstrom, H., (2008). Immediate effect of ischaemic compression and trigger point pressure release on neck pain and upper trapezius trigger points: A randomised controlled trial. *Clinical Chiropractic*, 11(1):30-36.

Gautam, R., Dhamija, J.K., Puri, A., Trivedi, P., Sathiyavani, D. and Nambi, G., (2014). Comparison of Maitland and Mulligan mobilization in improving neck pain, ROM and disability. *Int J Physiother Res,* 2(3):561-6.

Hoy, D., March, L., Woolf, A., Blyth, F., Brooks, P., Smith, E., Vos, T., Barendregt, J., Blore, J., Murray, C. and Burstein, R., (2014). The global burden of neck pain: estimates from the global burden of disease 2010 study. *Annals of the rheumatic diseases,* 73(7):1309-1315.

Hoy, D., Protani, M., De, R. and Buchbinder, R.J.B.P., (2010). The epidemiology of neck pain. *Best practice & research Clinical rheumatology*, 24(6):783-792.

Hoy, D., March, L., Woolf, A., Blyth, F., Brooks, P., Smith, E., Vos, T., Barendregt, J., Blore, J., Murray, C. and Burstein, R., (2014). The global burden of neck pain: estimates from the global burden of disease 2010 study. *Annals of the rheumatic diseases*, 73(7):1309-1315.

Hou, C.R., Tsai, L.C., Cheng, K.F., Chung, K.C. and Hong, C.Z., (2002). Immediate effects of various physical therapeutic modalities on cervical myofascial pain and trigger-point sensitivity. *Archives of physical medicine and rehabilitation,* 83(10):1406-1414.

Henschke, N., Kamper, S.J. and Maher, C.G., (2015), The epidemiology and economic consequences of pain. *In Mayo Clinic Proceedings,* 90, (1):139-147).

Hayes, M.J., Smith, D.R. and Taylor, J.A., (2013). Musculoskeletal disorders and symptom severity among Australian dental hygienists. *BMC research notes,* 6(1):1-5.

Hanten, W.P., Olson, S.L., Butts, N.L. and Nowicki, A.L., (2000). Effectiveness of a home program of ischemic pressure followed by sustained stretch for treatment of myofascial trigger points. *Physical therapy,* 80(10):997-1003.

Heintz, M.M. and Hegedus, E.J., (2008). Multimodal management of mechanical neck pain using a treatment-based classification system. *Journal of Manual & Manipulative Therapy*, 16(4):217-224.

Kannan, P., (2012). Management of myofascial pain of upper trapezius: a three-group comparison study. *Global journal of health science*, 4(5):46.

Kostopoulos, D., Nelson Jr, A.J., Ingber, R.S. and Larkin, R.W., (2008). Reduction of spontaneous electrical activity and pain perception of trigger points in the upper trapezius muscle through trigger point compression and passive stretching. *Journal of musculoskeletal pain*, 16(4):266-278.

Lucas, K.R., Rich, P.A. and Polus, B.I., (2008). How common are latent myofascial trigger points in the scapular positioning muscles. *Journal of musculoskeletal pain*, 16(4):279-286.

McColl, G., and Teichtahl, A.J. (2013). An approach to neck pain for the family physician. *Australian family physician*, 42(11):774-778.

McCaffery, M. and Pasero, C., (1999). Teaching patients to use a numerical pain-rating scale. *AJN The American Journal of Nursing*, 99(12):22.

Mense, S., (2010). How do muscle lesions such as latent and active trigger points influence central nociceptive neurons. *Journal of Musculoskeletal Pain*, 18(4):348-353.

Marklund, S. and Wänman, A., (2008). Incidence and prevalence of myofascial pain in the jaw–face region. A one-year prospective study on dental students. *Acta Odontologica Scandinavica*, 66(2):113-121.

Moradi-Lakeh, M., Forouzanfar, M.H., Vollset, S.E., El Bcheraoui, C., Daoud, F., Afshin, A., Charara, R., Khalil, I., Higashi, H., Abd El Razek, M.M. and Kiadaliri, A.A., (2017). Burden of musculoskeletal disorders in the Eastern Mediterranean Region, 1990–2013: findings from the Global Burden of Disease Study 2013. *Annals of the rheumatic diseases*, 76(8):1365-1373.

Nagrale, A.V., Glynn, P., Joshi, A. and Ramteke, G., (2010). The efficacy of an integrated neuromuscular inhibition technique on upper trapezius trigger points in subjects with non-specific neck pain: a randomized controlled trial. *Journal of Manual & Manipulative Therapy*, 18(1):37-43.

Naz, E. and Sarfraz, M., (2012). The effect of cranio-cervical exercise intervention and strength endurance training in neck pain. *Pakistan Journal of Rehabilitation,* 1(1):18-22.

Roth, G.A., Abate, D., Abate, K.H., Abay, S.M., Abbafati, C., Abbasi, N., Abbastabar, H., Abd-Allah, F., Abdela, J., Abdelalim, A. and Abdollahpour, I., (2018). Global, regional, and national age-sex-specific mortality for 282 causes of death in 195 countries and territories, 1980–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet,* 392(10159):1736-1788.

Rezasoltani, A., Ali-Reza, A., Khosro, K. K. and Abbass, R. (2010). Preliminary study of neck muscle size and strength measurements in females with chronic non-specific neck pain and healthy control subjects. *Manual Therapy,* 15 (4):400-403.

Sarigiovannis, P. and Hollins, B., (2005). Effectiveness of manual therapy in the treatment of non-specific neck pain: a review. *Physical therapy reviews*, 10(1):35-50.

Saturno, P.J., Medina, F., Valera, F., Montilla, J., Escolar, P. and Gascón, J.J., (2003). Validity and reliability of guidelines for neck pain treatment in primary health care. A nationwide empirical analysis in Spain. *International Journal for Quality in Health Care*, 15(6):487-493.

Sciotti, V.M., Mittak, V.L., DiMarco, L., Ford, L.M., Plezbert, J., Santipadri, E., Wigglesworth, J. and Ball, K., (2001). Clinical precision of myofascial trigger point location in the trapezius muscle. *Pain*, 93(3):259-266.

Simons, D.G., Travell, J.G. and Simons, L.S., (2005). Myofascial pain and dysfunction: the trigger point manual. *Upper half of body. London, United Kingdom: Williams and Wilkins,* 21 (1):22.

Sharifullah, M., Sajjad, A.G., Mobeen, A., Tariq, I., Khan, A. and Darain, H., (2018). Comparison of sustained pressure vs ischemic compression on trigger points in chronic myofacial pain management. *Khyber Medical University Journal,* 10(2):66-70

Sambyal, S. and Kumar, S., (2013). Comparison Between Nerve Mobilization And Conventional Physiotherapy In Patients With Cervical Radiculopathy. *International Journal of Innovative Research and Development,* 2(8):442-445

Skootsky SA, Jaeger B, Oye RK, (2000), Prevalence of myofascial pain in general internal medicine practice. *West J Med,* 151(1):157-160

Usman Z, Maharaj SS, Kaka B, (2019), Effects of combination therapy and infrared radiation on pain, physical function, and quality of life in subjects with knee osteoarthritis: A randomized controlled study. *Hong Kong physiother J,* 239(2):133-142

Ummar, M., Naee,, A., Badshah, M. and Amjad, I. (2012). Effectiveness of Cervical Traction Combined with Core Muscle Strengthening Exercises in Cervical Radiculopathy: A Randomized Control Trial. *Journal of Public Health and Biological Sciences,* 1 (4):115-120.

Vernon H, Mior S, (1991) The Neck Disability Index: a study of reliability and validity. *Journal of Manipulative and Physiological Therapeutics* 14(7):409-415.

Vos, T., Abajobir, A.A., Abate, K.H., Abbafati, C., Abbas, K.M., Abd-Allah, F., Abdulkader, R.S., Abdulle, A.M., Abebo, T.A., Abera, S.F. and Aboyans, V., (2017). Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet*, 390(10100):1211-1259.

Williams MA, (2010), Reliability and validity studies of methods for measuring active and passive cervical range of motion: a systematic review. *Journal Manipulative and physiological Therapeutics,* 3 (2):138-55.

Wang, H., Naghavi, M., Allen, C., Barber, R.M., Carter, A., Casey, D.C., Charlson, F.J., Chen, A.Z., Coates, M.M., Coggeshall, M. and Dandona, L., (2016). Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980â 2015: a systematic analysis for the Global Burden of Disease Study 2015. *The Lancet,* 388(10053):1459-1544.

Warden, S. J., (2010). Prophylactic use of NSAIDs by Athletes: A Risk/Benefit Assessment. *The Physician and Sports Medicine,* 38 (1):132-138.

Yap E-C, (2007), Myofascial pain–an overview. Ann Acad Med Singapore36(1):43-8.

Young, M., (2012). Immediate effect of muscle energy technique on latent trigger point of upper trapezius muscle, *Clinical Chiropractic,* 15 (3-4): 112-120

Zamani S., Okhovatian F., Naimi S., Akbarzadeh A., (2017). The Immediate Effect of a Combination of Pressure Release and Cervical Mobilization Techniques on the Active Range of Motion in the Latent Trigger Points of Upper Trapezius Muscle in Young Adult Females. *Austin Phys Med.* 1(1):1002.

APPENDIX

সম্মতিপত্র

(অংশগ্রহণকারীকে পড়ে শোনাতে হবে)

আসসালামু আলাইকুম,

আমি আফরোজা আলম শাওন, বাংলাদশ হেলথ প্রফেশন্স ইন্সটিটিউট এর বি.এস.সি ইন ফিজিওথেরাপি কোর্সের ৪র্থ বর্ষের একজন শিক্ষার্থী। অধ্যায়নের অংশ হিসেবে আমাকে একটি গবেষণা সম্পাদন করতে হবে এবং এটা আমার প্রাতিষ্ঠানিক কাজের একটা অংশ। নিম্নোক্ত তথ্যাদি পাঠ করার পর অংশগ্রহণকারীদের গবেষণায় অংশগ্রহনের জন্য অনুরোধ করা হলো।

আমার গবেষণার বিষয় হল **"যান্ত্রিক ঘাড়ে ব্যথার জন্য সক্রিয় ট্রিগার পয়েন্ট সংক্ষেপণ ও ট্রিগার পয়েন্ট চাপ হ্রাসের মধ্যকার তুলনা"**।

আমি প্রতিজ্ঞা করছি যে, এই গবেষণা আপনার জন্য ঝুঁকিপূর্ণ হবে না অথবা আপনার কোন ক্ষতি করবে না। গবেষণা চলাকলীন সময়ে কোন রকম দ্বিধা বা ঝুঁকি ছাড়াই যেকোন সময়ে আপনি এটাকে বাদ দিতে পারবেন। এই গবেষণার প্রাপ্ত তথ্য সম্পূর্ণভাবে গোপনীয় থাকবে এবং অংশগ্রহণকারীর ব্যক্তিগত তথ্য অন্য কোথাও প্রকাশ করা হবে না।

যদি আপনার গবেষণা সম্পর্কে কোনো জিজ্ঞসা থাকে তবে অনুগ্রহপূর্বক যোগাযোগ করতে পারেন আমার সাথে অথবা আমার সুপারভাইজার মোঃ আনোয়ার হসেন, সিনিয়র কনসালট্যাণ্ট এবং ফিজিওথেরাপি বিভাগের প্রধান, সিআরপি, সাভার, ঢাকা- ১৩৪৩ ।

শুরু করার আগে আপনার কি কোন প্রশ্ন আছে ?

আমি কি শুরু করতে পারি ?

হ্যাঁ ☐ না ☐

অংশগ্রহনকারীর স্বাক্ষর.....তারিখ……

তথ্য সংগ্রহকারীর স্বাক্ষর..... তারিখ……

Informed consent

(Please read out to the participant)

Assalamualaikum, my name is Afroza Alam Shawon. My study entitled**, "Comparison between trigger point compression and trigger point pressure release on upper active trapezius trigger point for mechanical neck pain".** I would like to know about some personal and other related information. You will answer some questions which are mentioned in this form. This will take approximately 30-35 minutes.

I would like to inform you that this is a purely professional study and will not be used for any other purpose. The researcher is not directly related with this obstetrics area, so your participation in the research will have no impact on your present or future treatment. All information provided by you will be treated as confidential and in the event of any report or publication it will be ensured that the source of information remains anonymous.

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

If you have any query about the study or your right as a participant, you may contact my supervisor Md. Anwar Hossain, Senior consultant & Head of Physiotherapy Dept, CRP, Savar, Dhaka-1343.

Do you have any questions before I start?

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

Yes ☐ No ☐

Name of the Interviewer…….....Date.....

Signature of the Interviewer..... Date……

Questionnaire (Bangla)

Comparison between trigger point compression and trigger point pressure release on upper active trapezius trigger point for mechanical neck pain.

ব্যাক্তিগত তথ্য

সাক্ষাতকারের তারিখঃ.....

কোড নংঃ.....

উত্তরদাতার নামঃ.....

ঠিকানাঃ.....

মোবাইল নং (ব্যাক্তিগত)ঃ.....

প্রথম সেকশন (সাব্জেকটিভ/ সোসিওডেমগ্রাফিক)

এই প্রশ্নাবলী ঘাড়ে ব্যাথা রোগীর ব্যাথা পরিমাপ করার জন্য তৈরী করা হয়েছে এবং এই বিভাগ টি রোগীর উত্তর অনুযায়ী টিক চিহ্ন দিয়ে পূরণ করা হবে কিন্তু বিশেষ ক্ষেত্রে ফিজিওথেরাপিষ্টরা কালো বা নীল কালি ব্যবহার করতে পারবে।

ক্রমিক নং	প্রশ্ন/তথ্য	অংশগ্রহণকারীর প্রতিক্রিয়া	
১.	বয়স	..... বছর	
২	লিঙ্গ	1. পুরুষ 2. মহিলা	
৩	উচ্চতা	সে.মি	BMI
৪	ওজন	কেজি	
৫	পরিবারের আয়তন	১= ৩-৫ ২= ৬-৮ ৩= ৯-১০	
৬	পারিবারিক মাসিক আয়		
৭	বৈবাহিক অবস্থা	১= বিবাহিত ২= অবিবাহিত ৩= ডিভোর্স	

		৪= বিধবা ৫= বিচ্ছেদ
৮	শিক্ষাগত যোগ্যতা	১= অশিক্ষিত ২= স্কুল পাশ ৩= মাধ্যমিক পাশ ৪= উচ্চমাধ্যমিক পাশ ৫= গ্রাজুয়েশন ৬= মাস্টার্স ৭= পোষ্ট গ্রাজুয়েশন
৯	পেশা	১=কৃষক ২=দিন মজুর ৩=চাকুরীজিবী I. সরকারি II. বেসরকারি ৪= ব্যাবসায়ী ৫= গার্মেন্টস শ্রমিক ৬= ড্রাইভার ৭= রিকশা চালক ৮=গৃহিণী ৯= শিক্ষক ১০= বেকার ১১= অন্যান্য(.....)
১০	কাজের ধরণ	১= ডেস্কের কাজ ২= দিন মজুরী ৩= গৃহস্থালি কাজ ৪= রং মিস্ত্রী ৫= অন্যান্য (.....)
১০	বাসস্থান	১= শহুরে ২= অর্ধ গ্রাম্য ৩= গ্রাম্য
১১	প্রধান কাজের অবস্থা	১= বসে ২= দাঁড়িয়ে ৩= হেঁটে ৪= ভ্রাম্যমাণ ৫= ঘাড় প্রসার ৬=অন্যান্য(.....)
১২	○ তামাক সেবন	১. হ্যা ২. না

		যদি হয়, কোন ধরনের তামাক যে সেবন করে: ○ ধূমপান ○ পান ○ জর্দা ○ গুল
১৩	○ মদ্যপায়ী	১. হ্যা ২. না
১৪	যেকোনো আঘাতের ঘটনা?	১. হ্যা ২. না যদি হ্যা হয়, কি ধরনের আঘাত: ○ সরাসরি আঘাত ○ অতিরিক্ত কাজের কারণে আঘাত ○ ছোট আঘাত ○ মানসিক আঘাত
১৫	আপনার কি দীর্ঘস্থায়ী অসুস্থতা আছে?	১= ডাইবেটিস ২= উচ্চরক্তচাপ ৩= হৃদরোগ ৪= কিডনীর রোগ ৫= লিভারের রোগ ৬= অস্টিওআরথ্রাইটিস ৭= রিওমাটয়েড বাত ৮=এঙ্কাইলসিংস্পন্ডাইলাইটিস ৯= অন্যান্য (.....)
১৬	কোন ধরনের চিকিৎসা আপনি নিয়েছেন?	১= ওষুধ চিকিৎসা ২= ফিজিওথেরাপী ৩= ব্যথা ঘাতক ৪=ঐতিহ্যগত ওষুধ ৫= অন্যান্য (.....)

দ্বিতীয় সেকশন (ব্যাথার অবস্থা)

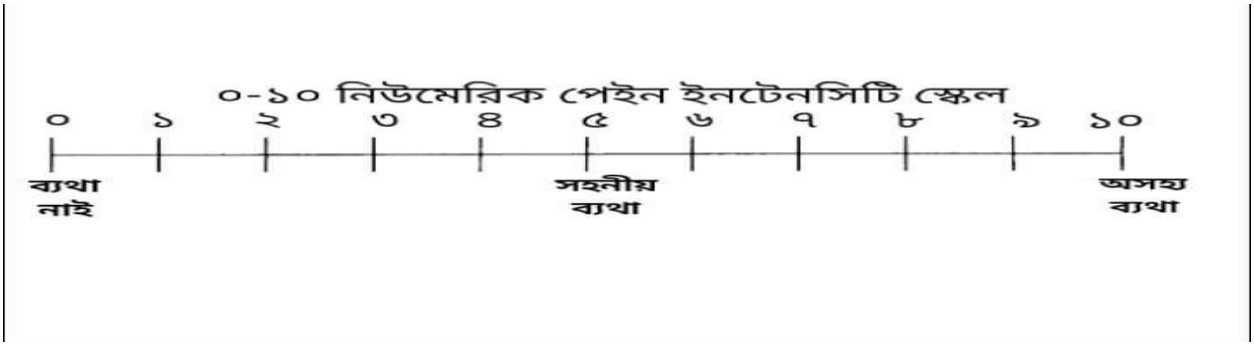
ব্যাথা পরিমাপের জন্য সংখ্যাগত রেটিং স্কেল

এই প্রশ্নপত্রটি সাধারণত ঘাড়ে ব্যথা রোগীদের ব্যথা পরিমাপের জন্য তৈরি করা হয়েছে। ম্যাক ক্যাফেরি এট এ্যাল., ১৯৯৯ সালে এই সংখ্যাগত রেটিং স্কেলটি ব্যাথা পরিমাপের জন্য প্রথম ব্যবহার করেছিলেন। এটি ব্যথা পরিমাপের সংখ্যাগত রেটিং স্কেল হিসেবে পরিচিত। এই স্কেলটি ১০ সেমি পর্যন্ত লম্বা এবং এটি ০-১০ পর্যন্ত পরিমাপ করা হয়। এখানে ০ মানে কোন ব্যাথা নেই। ১-৩ হাল্কা ব্যথা নির্দেশ করে, ৩-৫ সাধারণত সহনীয় ব্যথা নির্দেশ করে এবং রোগীরা সবচেয়ে খারাপ ব্যথা অনুভব করে যখন ৬-১০ পর্যন্ত নির্দেশ করা হয়। প্রশ্নপত্রের এই বিভাগ টি রোগীদের দ্বারা পূরণ করা হয়, এক্ষেত্রে কালো বা নীল কালি ব্যবহার করা হয়।

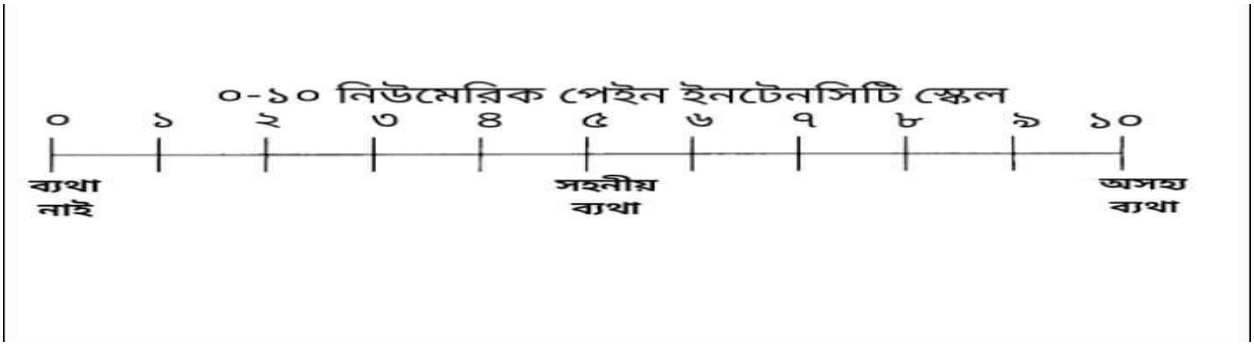
উদাহরণসরূপঃ সংখ্যাগত ব্যাথা পরিমাপের স্কেল অনুযায়ী কোন অংশগ্রহণকারীর ব্যাথা ৭-৯ পর্যন্ত থাকে তাহলে সে নিম্নলিখিত ভাবে স্কেলটির ঘর পূরণ করবেঃ

০ ১ ২ ৩ ৪ ৫ ৬ (৭) ৮ (৯) ১০

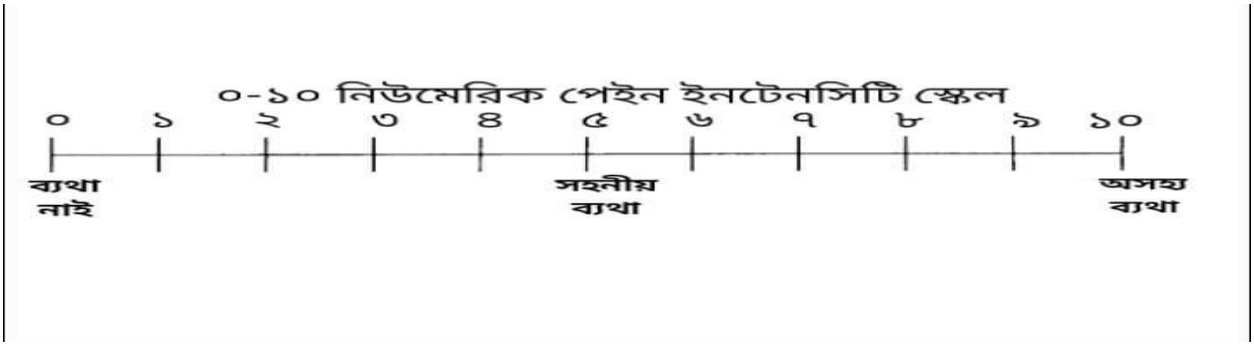
২.১ আজ আপনার ব্যথা কত টুকু ?



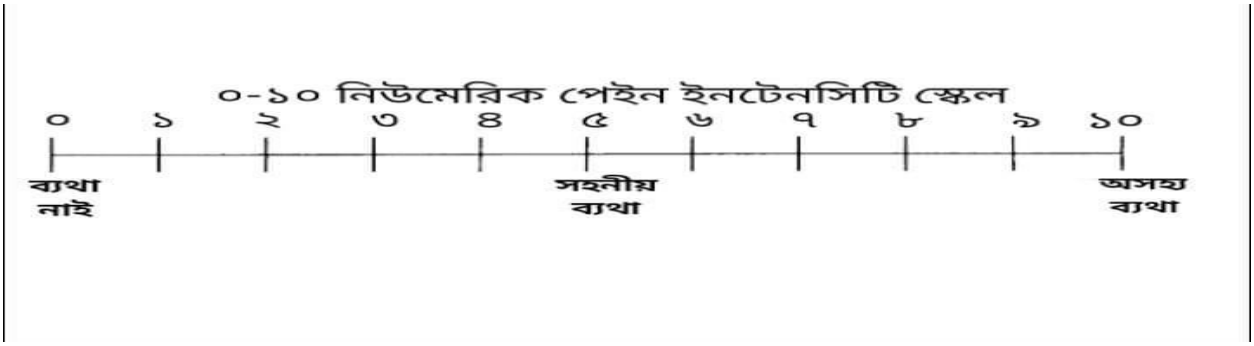
২.২ ঘাড় ঘুরানোঃ ঘাড় ঘুরানোর সময় আপনি কতটুক ব্যথা অনুভব করেন



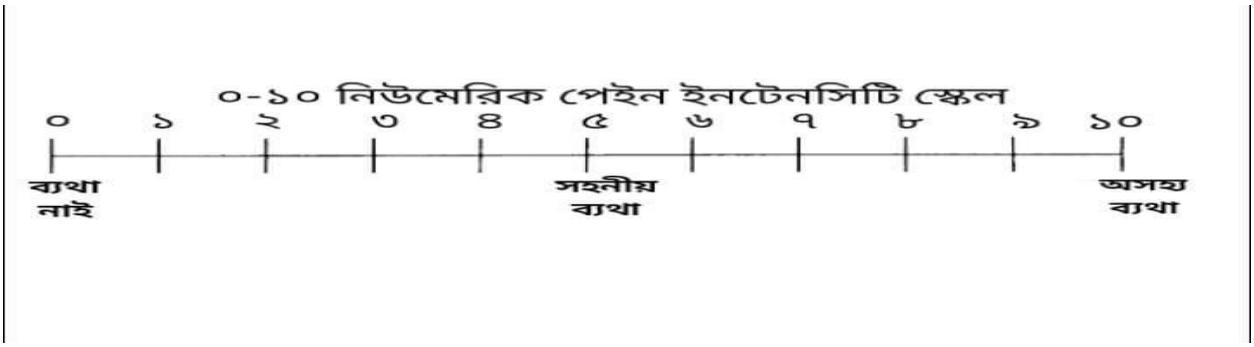
২.৩ বসে থাকাঃ বসে থাকা অবস্থায় আপনি কতটুক ব্যথা অনুভব করেন ?



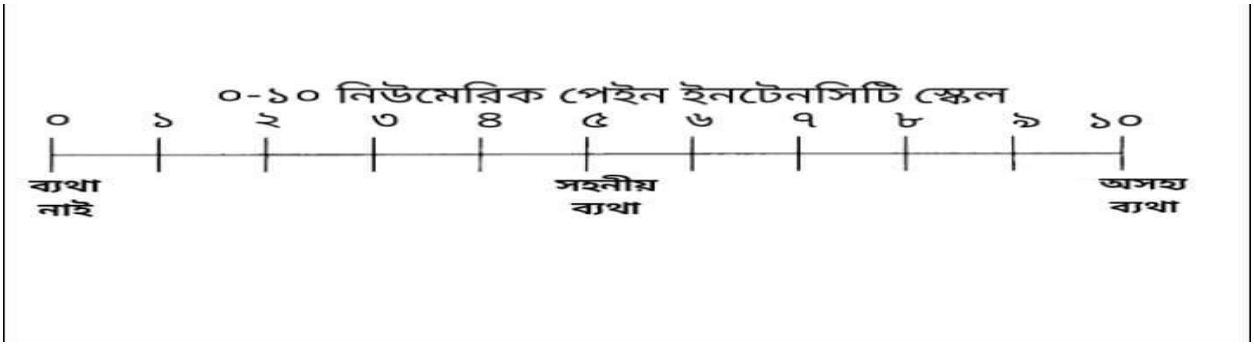
২.৪ ঘুমানোঃ ঘুমানোর সময় আপনি কতটুক ব্যথা অনুভব করেন?



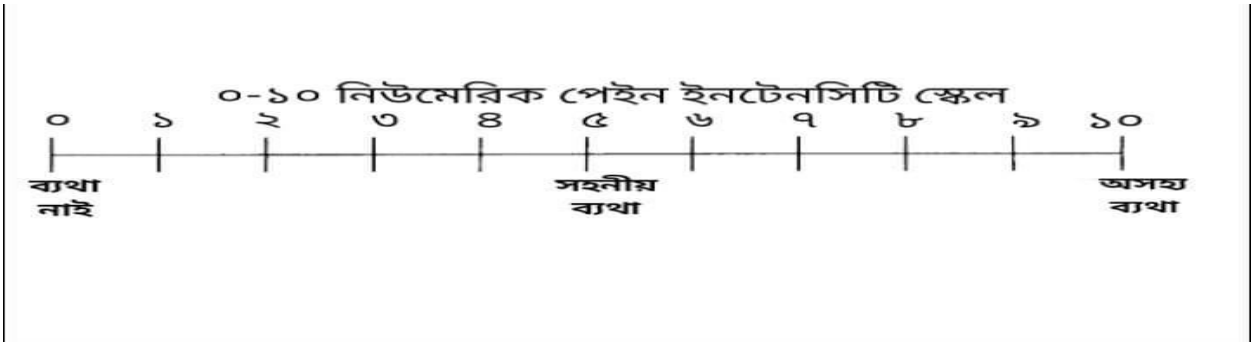
২.৫ পড়াঃ পড়ার সময় আপনি কতটুক ব্যথা অনুভব করেন?



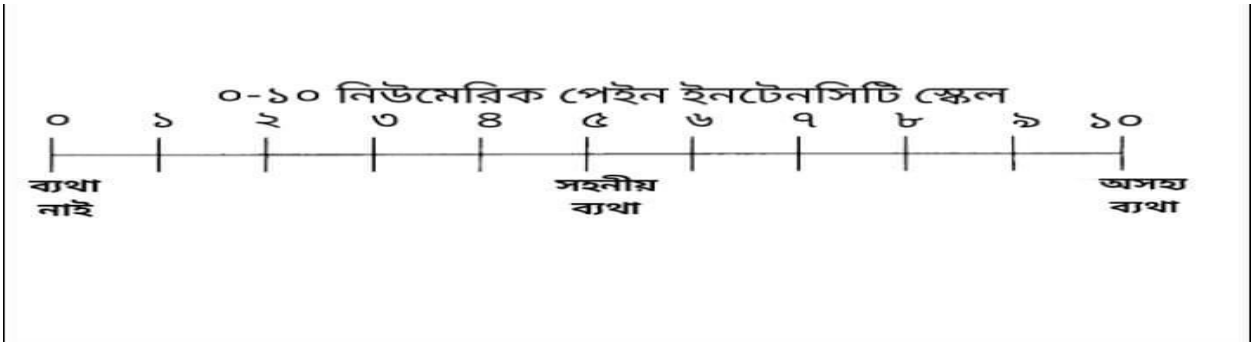
২.৬ দৈনন্দিন কাজঃ দৈনন্দিন কাজে আপনি কতটুকু ব্যথা অনুভব করেন?



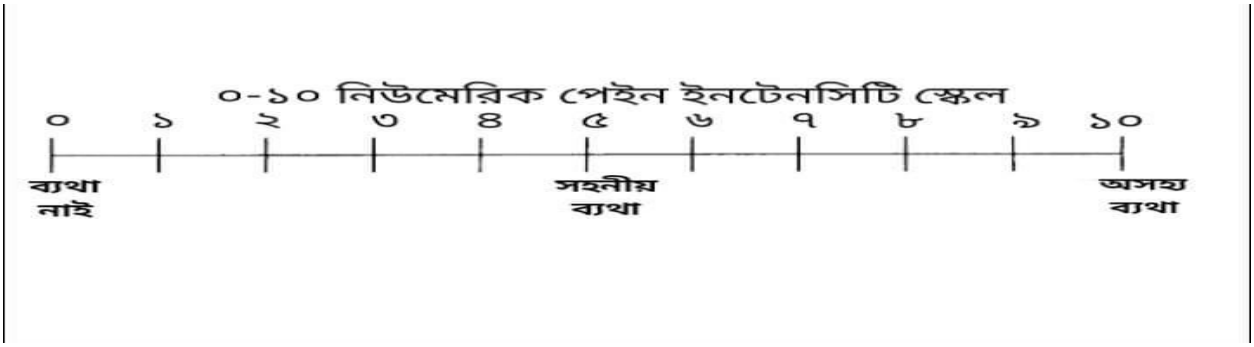
২.৭ গৃহস্থালি কাজঃ গৃহস্থালি কাজে আপনি কতটুকু ব্যথা অনুভব করেন?



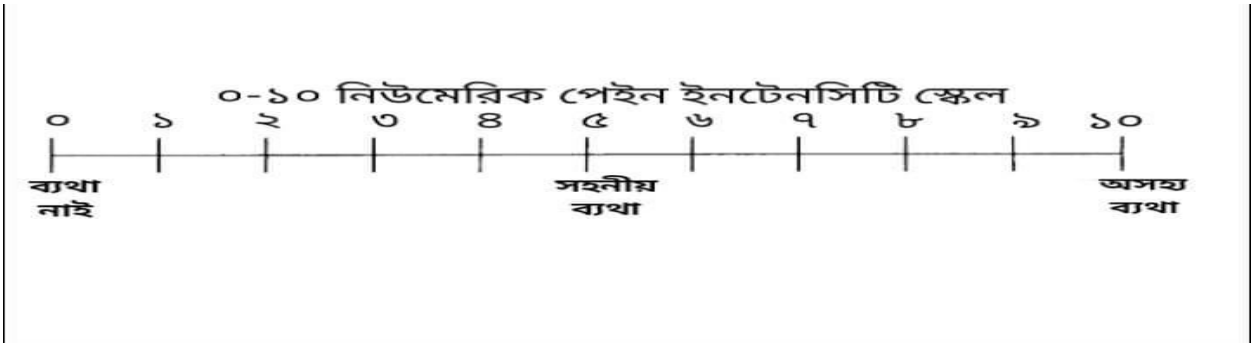
২.৮ দাঁড়িয়ে থাকাঃ দাঁড়িয়ে থাকাকালীন আপনি কতটুকু ব্যথা অনুভব করেন?



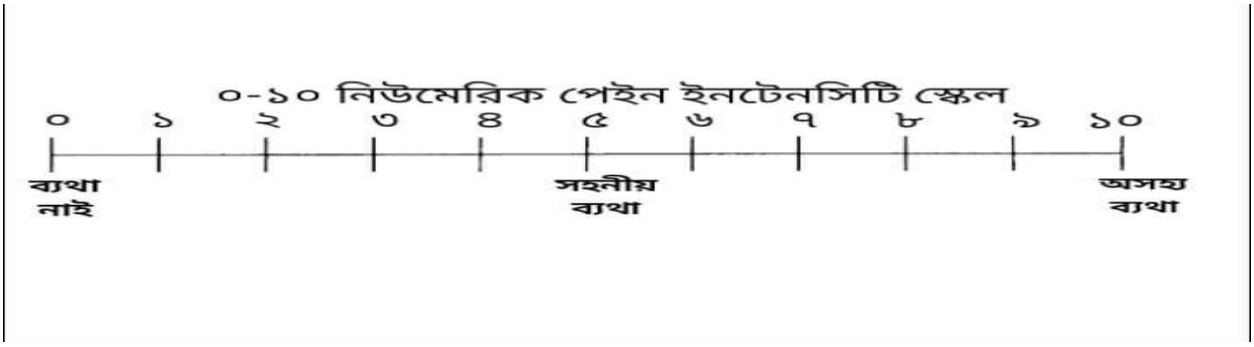
২.৯ হাঁটাঃ হাঁটার সময় আপনি কতটুকু ব্যথা অনুভব করেন?



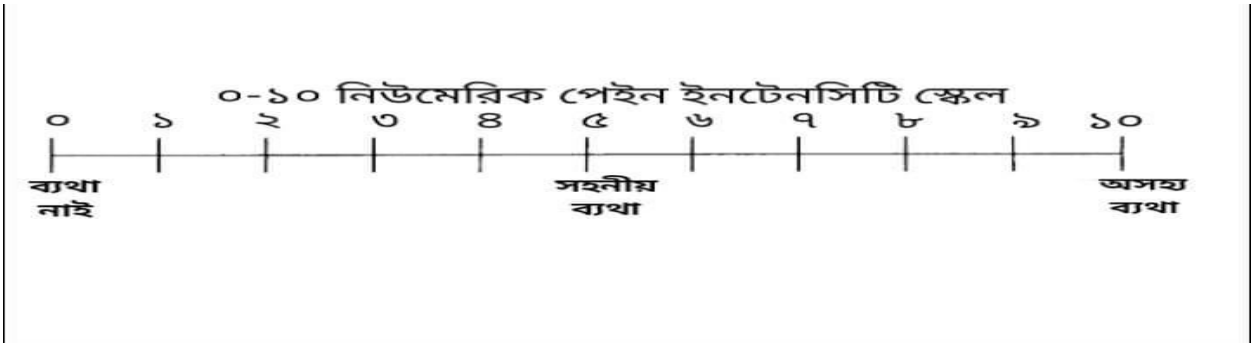
২.১০ খেলাধুলাঃ খেলাধুলার সময় আপনি কতটুকু ব্যথা অনুভব করেন?



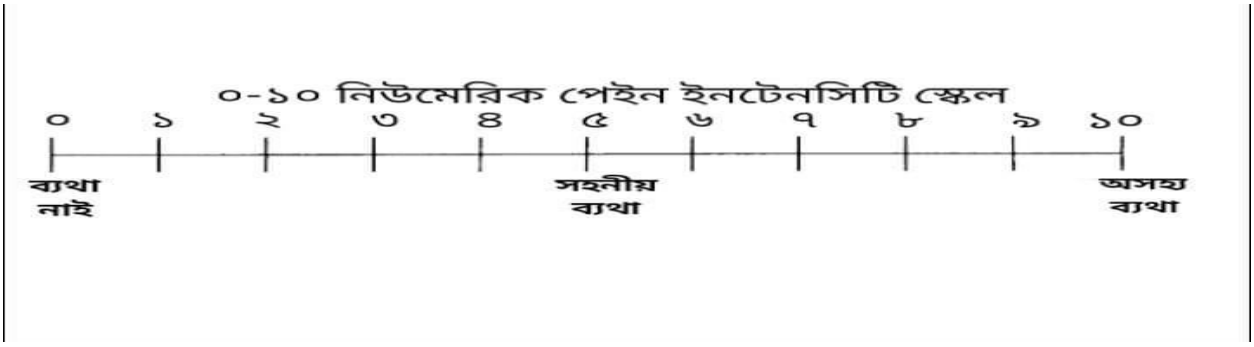
২.১১ বিশ্রামঃ বিশ্রামের সময় আপনি কতটুকু ব্যথা অনুভব করেন?



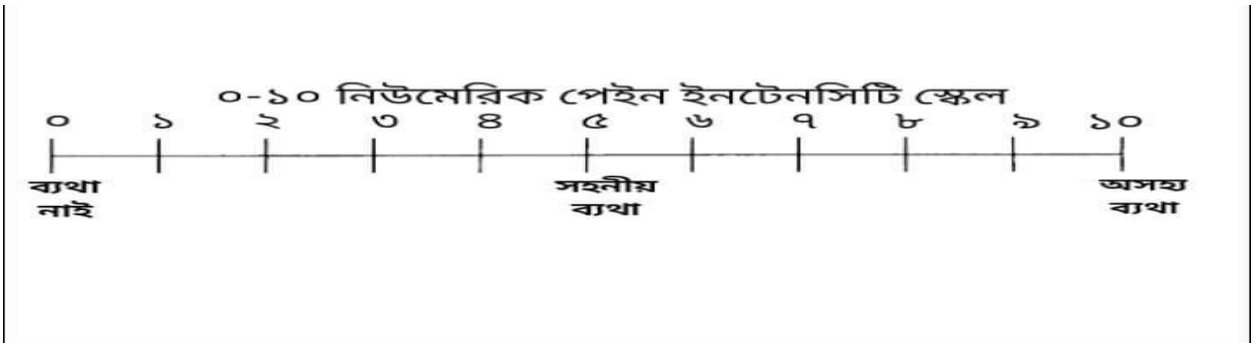
২.১২ নিজের যত্নঃ নিজের যত্ন নেয়ার সময় আপনি কতটুকু ব্যথা অনুভব করেন?



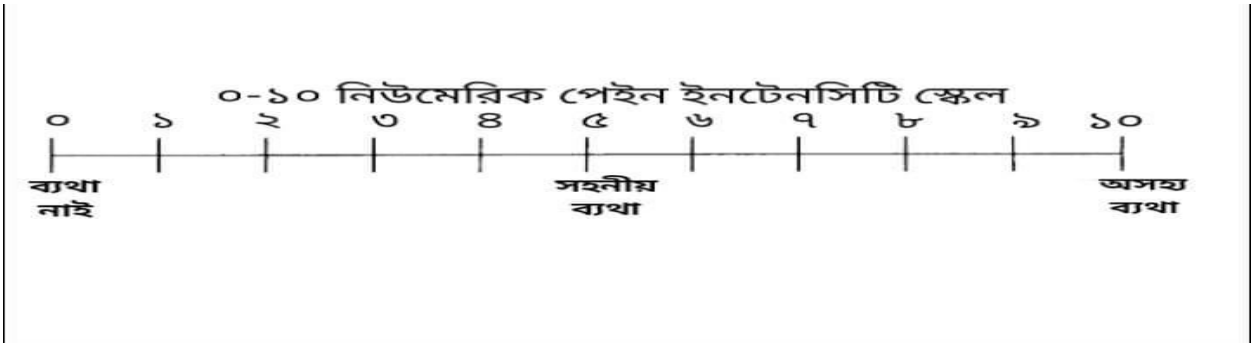
২.১৩ ভারী জিনিস উত্তোলনঃ ভারী জিনিস তোলার সময় আপনি কতটুকু ব্যথা অনুভব করেন?



২.১৪ মোবাইল বা কম্পিউটার চালানোর সময় আপনি কতটুকু ব্যথা অনুভব করেন?



২.১৫ গাড়ি চালানোঃ গাড়ি চালানোর সময় আপনি কতটুকু ব্যথা অনুভব করেন?



তৃতীয় সেকশন (রেঞ্জ অফ মোশন এর অনুমান)

গনিওমিটার দিয়ে সারভাইকাল জয়েন্ট এর রেঞ্জ অব মোশন এর পরিমাপ নিম্নে দেয়া হলঃ

মুভমেন্ট	রেঞ্জ অফ মোশন
ফ্লেক্সন	
এক্সটেনশন	
রাইট সাইড রোটেশন	
লেফট সাইড রোটেশন	
রাইট সাইড বেন্ডিং	
লেফট সাইড বেন্ডিং	

চতুর্থ সেকশন (ক্রিয়ামূলক কাজকর্মের অনুমান)

নেক পেইন ডিসএ্যাবিলিটি ইনডেক্স এর মাধ্যমে অক্ষমতার পরিমাপঃ

অধ্যায় ১- ব্যথার তীব্রতাঃ

- আমার এই মুহূর্তে কোন ব্যথা নেই।
- আমার এই মুহূর্তে খুব হালকা ব্যথা আছে।
- আমার এই মুহূর্তে মাঝারি ব্যথা আছে।
- আমার এই মুহূর্তে ব্যথা মোটামুটি গুরুতর।
- আমার এই মুহূর্তে ব্যথা খুব গুরুতর।
- আমার এই মুহূর্তে ব্যথা সবচেয়ে খারাপ।

অধ্যায় ২- ব্যক্তিগত যত্নঃ

- আমি সাধারণত অতিরিক্ত ব্যথা ছাড়াই নিজের দেখাশোনা করার কাজ করতে পারি।
- আমি সাধারণত নিজের দেখাশোনা করতে পারি কিন্তু এতে অতিরিক্ত ব্যথা হয়।
- আমি নেজেকে দেখাশোনার কাজ করতে গেলে ব্যথা অনুভব করি এবং আমি ধীরগতি ও সতর্কতা অবলম্বন করি।
- আমাকে সামান্য সাহায্য করলে আমি আমার ব্যক্তিগত যত্নের অধিকাংশ কাজই পরিচালনা করতে পারি।
- আমার নিজের যত্নের অধিকাংশ ক্ষেত্রে প্রতিদিনই সাহায্যের প্রয়োজন হয়।
- আমি কাপড় পরিধান করতে পারি না,আমার কাপড় ধৌত করতে অসুবিধা হয় এবং বিছানায় শুয়ে থাকতে হয়।

অধ্যায় ৩- উত্তোলনঃ

- আমি অতিরিক্ত ব্যথা ছাড়াই ভারী ওজন উত্তোলন করতে পারি।
- আমি ভারী ওজন উত্তোলন করতে পারি কিন্তু এটা অতিরিক্ত ব্যথা দেয়।
- ব্যাথা আমাকে মেঝে থেকে ভারী ওজন উত্তোলন করতে বাধা দেয়,কিন্তু আমি তা পারি যদি সেটা সুবিধামত কোন যায়গায় স্থাপন করা থাকে,উদাহরণসরূপ কোন একটি টেবিলের উপর থেকে।
- ব্যাথা আমাকে মাঝে থেকে ভারী ওজন উত্তোলন করতে বাধা দেয়,কিন্তু আমি মাঝারি থেকে হালকা ওজন উত্তোলন করতে পারি যদি সেটা সুবিধামত কোথাও স্থাপন করা থাকে।
- আমি শুধুমাত্র হালকা ওজন উত্তোলন করতে পারি।

- আমি কোন কিছু উত্তোলন বা কিছু বহন করতে পারি না।

অধ্যায় ৪- পড়াঃ

- আমি আমার ঘাড়ে কোন ব্যথা ছাড়াই যতটা আমি চাই ততটা আমি পড়তে পারি।
- আমি আমার ঘাড়ে সামান্য ব্যথা নিয়ে যতটা আমি চাই পড়তে পারি।
- আমি আমার ঘাড়ে সহনীয় ব্যথা নিয়ে যতটা আমি চাই পড়তে পারি।
- আমি আমার ঘাড়ে মাঝারি ব্যথার কারণে যতটা চাই ততটা পড়তে পারি না।
- আমি আমার ঘাড়ে তীব্র ব্যথার কারণে খুব কমই পড়তে পারি।
- আমি ব্যাথার কারণে একদমই পড়তে পারি না।

অধ্যায় ৫- মাথাব্যথাঃ

- আমার একদমই মাথা ব্যথা নেই।
- আমার হালকা মাথা ব্যথা আছে যেটা মাঝে মধ্যে আসে।
- আমার মাঝারি মাথা ব্যথা আছে যেটা মাঝে মধ্যে আসে।
- আমার মাঝারি মাথা ব্যথা আছে যেটা প্রায়ই আসে।
- আমার তীব্র মাথা ব্যথা আছে যেটা প্রায়ই আসে।
- আমার সবসময় মাথা ব্যথা থাকে।

অধ্যায় ৬-মনোযোগঃ

- আমি কোন অসুবিধা ছাড়াই যখন চাই তখন পুরোপুরি মনোযোগ দিতে পারি।
- আমি সামান্য অসুবিধার মধ্যেও পুরোপুরি মনোযোগ দিতে পারি।
- মনোযোগ দিতে আমার খুব অল্পমাত্রায় অসুবিধা হয়।
- আমি যখন মনোযোগ দিতে চাই তখন খুব অসুবিধা হয়।
- আমি যখন মনোযোগ দিতে চাই তখন গুরুতর অসুবিধা হয়।
- আমি একদমই মনোযোগ দিতে পারি না।

অধ্যায় ৭-কাজঃ

- আমি যত চাই তত কাজ করতে পারি।
- আমি শুধুমাত্র আমার স্বাভাবিক কাজ করতে পারি কিন্তু এর বেশি না।
- আমি আমার অধিকাংশ স্বাভাবিক কাজ করতে পারি কিন্তু এর বেশি না।
- আমি আমার স্বাভাবিক কাজ করতে পারি না।
- আমি খুব কমই কাজ করতে পারি।
- আমি একদমই কোন কাজ করতে পারি না।

অধ্যায় ৮- গাড়িতে ভ্রমণঃ

- আমী কোন ঘাড়ে ব্যথা ছাড়াই আমার গাড়ি চালাতে পারি।
- আমি আমার ঘাড়ে সামান্য ব্যথা নিয়েই গাড়ি চালাতে পারি।
- আমি আমার ঘাড়ে সহনীয় ব্যথা নিয়েই গাড়ি চালাতে পারি।
- আমি আমার ঘাড়ে মাঝারি ব্যথার কারণে যতক্ষন দীর্ঘ খুশি ততক্ষন গাড়ি চালাতে পারি না।
- আমি আমার ঘাড়ে তীব্র ব্যথার কারণে গাড়ি চালাতে পারি না।
- আমি একদমই গাড়ি চালাতে পারি না।

অধ্যায় ৯- ঘুমানোঃ

- আমার ঘুম আসতে কোন কষ্ট হয় না।
- আমার ঘুম আসতে সামান্য সমস্যা হয় (১ ঘন্টার বেশি সময় নির্ঘুম কাটে)।
- আমার ঘুম আসতে সমস্যা হয় (১ থেকে ২ ঘন্টার বেশি সময় নির্ঘুম কাটে)।
- আমার ঘুম পরিমিতরুপে নষ্ট হয় (২ থেকে ৩ ঘন্টা নির্ঘুম কাটে)।
- আমার ঘুম ব্যাপক ভাবে নষ্ট হয় (৩ থেকে ৫ ঘন্টা নির্ঘুম কাটে)।
- আমার ঘুম একদমই হয় না (৫ থেকে ৭ ঘন্টা নির্ঘুম কাটে)।

অধ্যায় ১০- বিনোদনঃ

- আমি আমার সবধরনের বিনোদনমূলক কাজে অংশ নিতে পারি কোন রকম ঘাড়ে ব্যথা ছাড়াই।
- হালকা ঘাড়ে ব্যথা নিয়ে আমি আমার সবধরনের বিনোদনমূলক কাজে অংশ নিতে পারি।
- আমার ঘাড়ে ব্যথার কারণে সবগুলো নয় বরং বেশিরভাগ বিনোদনমূলক কাজে অংশ নিতে পারি।
- আমি আমার ঘাড়ে ব্যথা কারণে আমি অল্প পরিসরে আমার বিনোদনমূলক কাজে অংশ নিতে পারি।
- আমি আমার ঘাড়ে ব্যথার কারণে খুব কমই আমার বিনোদনমূলক কাজে অংশ নিতে পারি।
- আমি আমার ঘাড়ে ব্যথার কারণে কোন ধরনের বিনোদনমূলক কাজ করতে পারি না।

Questionnaire (English)

Comparison between trigger point compression and trigger point pressure release on upper active trapezius trigger point for mechanical neck pain.

Personal details

Date of interview:……

Code no:……..

Name of the respondant:……..

Address :……

Mobile no: (personal number):

Section 1 (Subjective/ Sociodemographic question)

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

	Questions/Information on	Response of the participant	
1.	Age	……. years	
2	Sex	1. Male 2. Female	
3	Height	cm	BMI
4	Weight	kg	
6	Marital status	1= Married 2= Unmarried 3= Divorced 4= Widow 5= Separated	
7	Educational status	1= Illiterate 2= Primary 3= SSC 4= HSC 5= Graduation 6= Masters 7= Post graduations	

8	Occupation	1=Farmer 2=Day labor 3=Service holder I. Government II. Non-government 4=Businessman 5=Garments worker 6=Driver 7=Rickshaw puller 8=Housewife 9=Teacher 10=Unemployment 11=Others (Specify……)
9	working nature	1=Desk work 2=Daily labour 3=House keeping 4=Painter 5=Others (specify……)
10	Living area	1=Urban 2=Semirural 3=Rural
11	Major working position	1=Sitting 2=Standing 3=Walking 4=Traveling 5=Neck extension 6=Others (specify…)
12	o Tobacco intake o Alcoholic	1. Yes 2. No If yes, what kind of tobacco he/she intake: o Smoking o Bettle leaf o Jorda
13	Any history of trauma?	1. Yes 2. No If yes. What kind of trauma it is? o Direct trauma o Over use trauma o Microtrauma o Psychological trauma

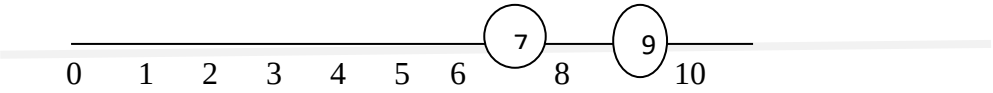
14	Do you have any chronic illness	1=Diabetic Mellitus 2=Hypertension (HTN) 3=heart disease 4=kidney disease 5=Liver disease 6=Osteoarthritis 7=Rheumatoid arthritis 8=Ankylosing spondylosis 9=Others (specify ……)
14	What type of treatments you have tried?	1=Medical treatment 2=Physiotherapy 3=Pain killer 4=Traditional medicine 5=Others (specify……..)

Section 2 (Pain status)

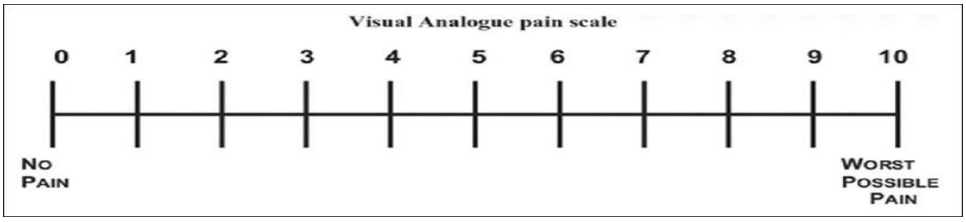
Numeric Pain Rating Scale (NPRS) for pain Measurement

This questionnaire is designed for mechanical neck pain patients. McCaffery et al. (1999) used a numeric scale to rate the pain status experienced by patients. It is known as Numeric Pain Rating Scale. The scale is a 10cm long scale ranging from 0-10. Here a zero (0) means no pain, 1-3 indicates mild pain, 3-5 indicates that pain is in moderate state and 6-10 is worst possible pain feeling experienced by patients. This section of questionnaire will be filled by the patient using a black or blue colored ball pen.

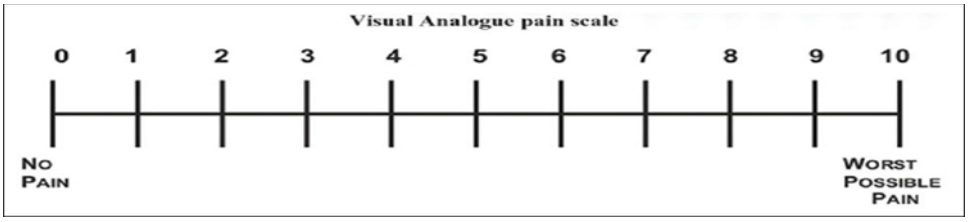
For example- If any participant has pain between 7 to 9 at Numeric Pain Rating Scale than he/ she will fill up:



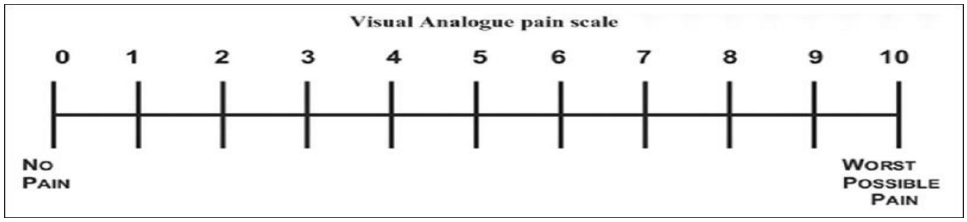
2.1 How bad is your pain today?



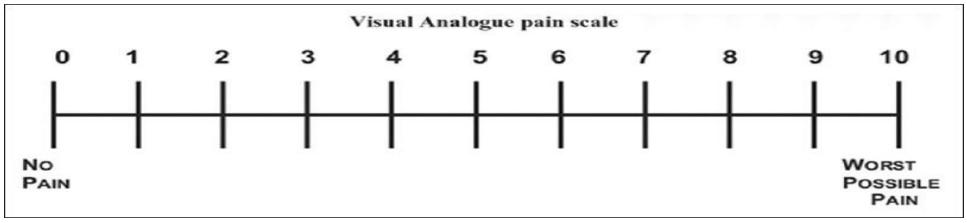
2.2 Turning: How much pain do you feel at turning?



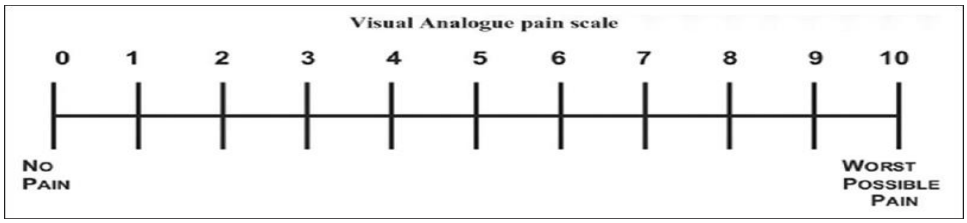
2.3 Sitting: How much pain do you feel at sitting?



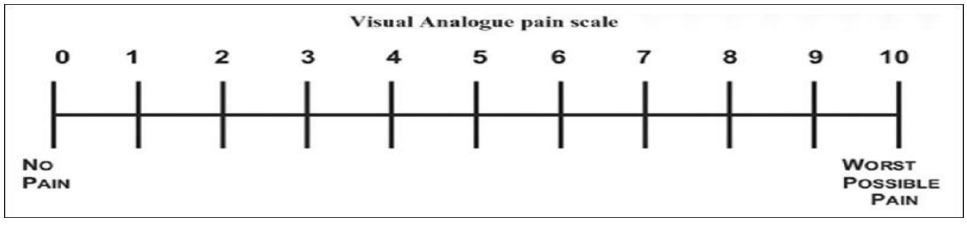
2.4 Lying: How much pain do you feel at lying?



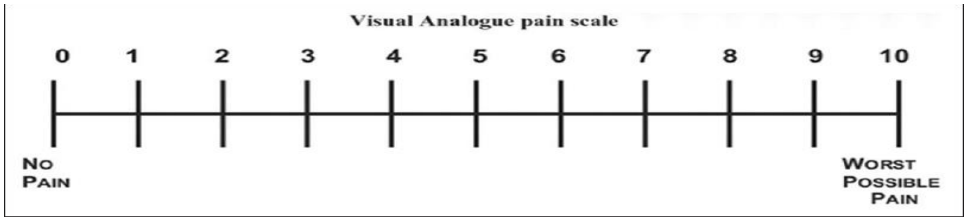
2.5 Reading: How much pain do you feel at working?



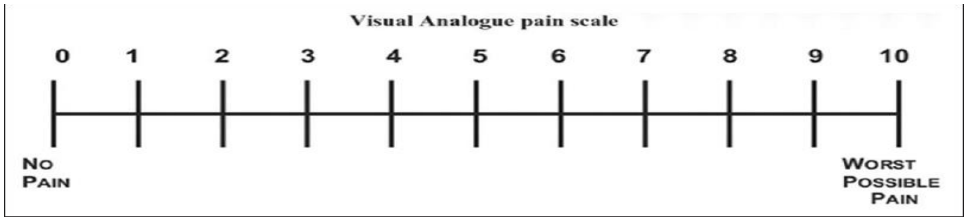
2.6 Daily activities: How much pain do you feel in daily activities?



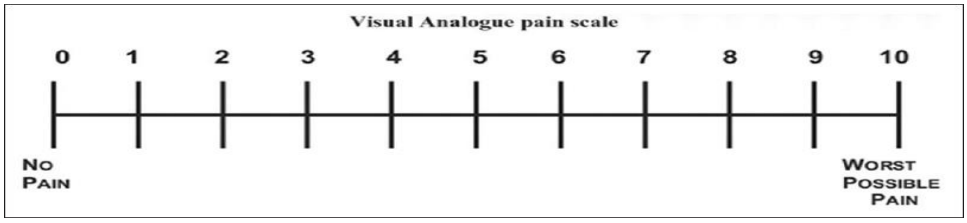
2.7 Household chores: How much pain do you feel in doing household chores?



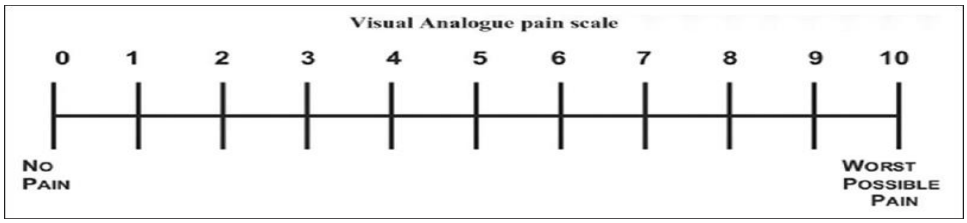
2.8 Standing: How much pain do you feel in standing?



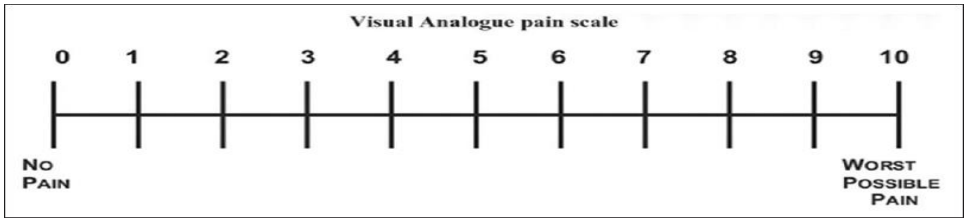
2.9 Walking: How much pain do you feel in walking?



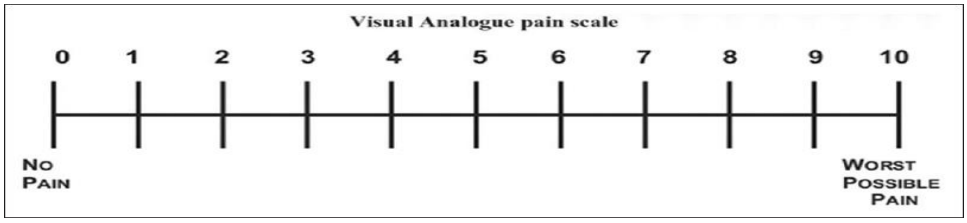
2.10 Playing: How much pain do you feel in playing?



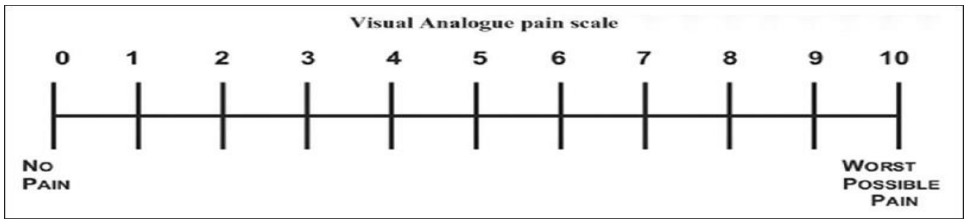
2.11 Resting: How much pain do you feel in resting?



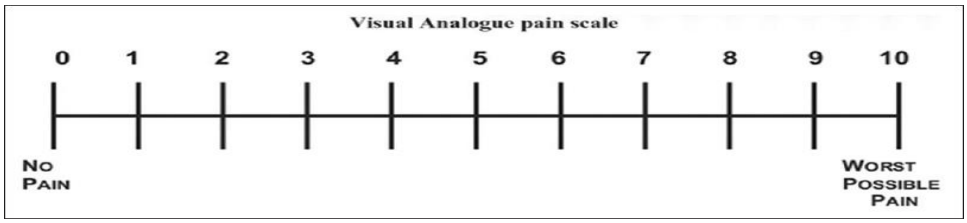
2.12 Self-care: How much pain do you feel in self-care?



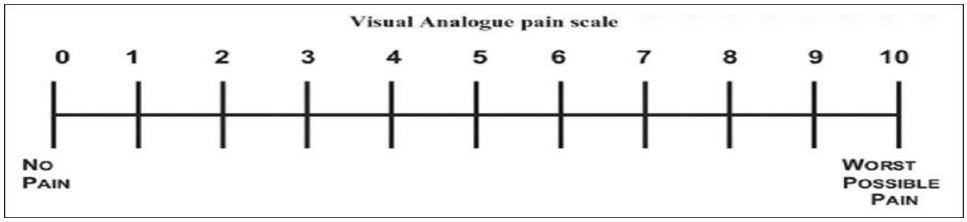
2.13 Carrying heavy loads: How much pain do you feel in carrying heavy loads?



2.14 Mobile phone or computer: How much pain do you feel in using mobile phone or computer?



2.15 Travelling: How much pain do you feel in travelling?



Section 3 (Estimate the range of motion)

Cervical joint range of motion measured by goniometer:

Movements	Range of motion
Flexion	

Extension	
Right side rotation	
Left side rotation	
Right side bending	
Left side bending	

Section 4 (Estimate functional activities)

Disability measurement by Neck Pain Disability Index (NPDI):

Pain intensity:

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

Personal care (washing, dressing etc)

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

Lifting

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

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 to with moderate pain in my neck.
- I cannot read as much as I want because of moderate pain in my neck.
- I cannot read as much as I want because of severe pain in my neck.
- I cannot read at all.

Headache

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

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.

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 cannot do any work at all.

Driving

- I can 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 cannot drive my car as long as I want because of moderate pain in my neck.
- I can hardly drive at all because of severe pain in my neck.
- I cannot drive my car at all

Sleeping

- I have no trouble sleeping.
- My sleep is slightly disturbed (less than 1 hour sleepless).
- My sleep is mildly disturbed (1-2 hours sleepless).
- My sleep is moderately disturbed (2-3 hours sleepless).
- My sleep is greatly disturbed (3-5 hours sleepless). F
- My sleep is completely disturbed (5-7 hours)

Recreation

- I can engage in all of my recreational activities with no neck pain at all.
- I can engage in all of my recreational activities with some pain in my neck.
- I can engage in most, but not all of my recreational activities because of pain in my neck.
- I can engage in a few of my recreational activities because of pain in my neck.
- I can hardly do any recreational activities because of pain in my neck.
- I cannot do any recreational activities at all

Intervention:

Trigger point compression: Trigger point compression is one of the least invasive trigger point therapies and has been employed by chiropractors since 1957

It is a mechanical treatment of myofascial trigger points that consists of application of sustained pressure for a long enough time to inactivate the trigger points.

At first patients should be placed on a suitable position. Patients should perform the range of motion exercise over the neck to find out the abnormality. Then identify the trigger point through palpation over the trapezius muscle. After finding the location, therapist should put pressure over the knot via thumb, finger, knuckle or elbow depending on the size, depth or thickness of the muscle being compressed. Press the point (or squeeze, if the trigger lies in very soft muscle tissue, such as that in the upper trapezius muscle, or in muscles of the neck where pressure would be unwise) until the referred symptoms are noted and hold this pressure for 5 seconds. Ease the pressure off by about 50% for a further 2-3 seconds. Continue this repetition of 5 seconds on, 2-3 seconds off, for a minute or until, when the pressure is being applied, a marked reduction in the intensity of the referred symptom is felt, as compared with the level at the outset. A thumb or finger from the other hand may be used for reinforcement. Pressure is most effective when applied straight into the trigger point. At this time, pressure or squeezing should stop. The muscle in which the trigger lies now requires stretching. Then ice should be applied over the treated area for about 10-15 minutes. This procedure should be repeated 2 to 3 days over a week. Care must be taken not to exceed the patient's tolerance, and if the patient tenses or pulls away, then a lighter pressure should be applied.

Figure 01: Procedure of upper trapezius trigger point compression.

Trigger point release:

At first patients should be placed on a suitable position. Patients should perform the range of motion exercise over the neck to find out the abnormality. Trigger point release should be given to the patients in the point of tension by upper trapezius palpation. The muscle should be placed in a position of comfort and maintained by reduction or abolition of tension and monitored by a gentle touch on these points. It is a non-excruciating strategy that gradually increased the pressure with the thumb over the trigger point until a tissue boundary is found. The degree of pressure is kept up with the release of tissue boundary. The pressure is increased when another tissue boundary is recognized (Simons et al., 2005). Before and after application of the trigger point release of each session, patients should be questioned about the intensity of pain, which could range from 0 (no pain) to 10 (unbearable pain). This strategy is continued until the trigger points or tenderness are completely gone.

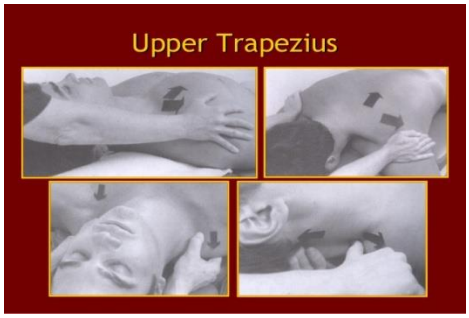


Figure02: Procedure for upper trapezius trigger point release

Permission Letter

Date: 19th September,2020

Head

Department of Physiotherapy

Centre for the Rehabilitation of the Paralysed (CRP)

Through: Head,Department of Physiotherapy,BHPI

Subject: Prayer for seeking permission to collect data for conducting research project.

Sir,

With due respect and humble submission to state that I am Afroza Alam Shawon,a student of 4th year Bsc in Physiotherapy at Bangladesh Health Professions Institute (BHPI).The Ethical committee has approved my research project entitled: **"Comparission between trigger point compression and trigger point release on upper active trapezius trigger point for mechanical neck pain"** under the supervision of Mohammad Anwar Hossain,Associate Professor,Head of the Physiotherapy Department,BHPI.I want to collect data for my research project from the Department of Physiotherapy at CRP. So, I need permission for data collection from the Musculoskeletal Unit of Physiotherapy Department at CRP (CRP,Sâvar-Dhaka-1343) I would like to assure that anything of the study will not be harmful for the participantys.

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

Yours faithfully

Afroza Alam Shawon

Afroza Alam Shawon

4th year

Bsc in Physiotherapy

Class roll no: 34 Session: 2015-2016

Bangladesh Health Professions Institute (BHPI)

(An academic Institution of CRP)

CRP-Chapain,Savar,Dhaka-1343

Recommended for necessary action.
Shafi
19.09.20

Approved
18/11/2020
MOHAMMAD ANWAR HOSSAIN
Senior Consultant &
Head of Physiotherapy Dept
Associate Professor, BHPI
CRP, Savar, Dhaka-1343

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 Afroza Alam Shawon, student of 4th professional Bsc 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. This is a four year full time course. Conducting thesis project is partial fulfillment of the requirement for the degree of B.Sc. in physiotherapy. I have to conduct a thesis entitled, **"Comparison between trigger point compression and trigger point release on upper active trapezius trigger point for mechanical neck pain"** under the supervision of Mohammad Anwar Hossain, Associate professor of BHPI and Head of the physiotherapy department, CRP, Savar, Dhaka-1343. The purpose of this study to explore the effectiveness in between two treatment protocol (trigger point compression and trigger point release) on upper trapezius trigger point for mechanical neck pain. 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.

I, therefore pray and hope that your honor would be kind enough to approve my thesis proposal and give me permission to start data collection and oblige thereby.

Sincerely

Afroza

Afroza Alam Shawon

4th professional B.Sc. in Physiotherapy

Roll: 34

Session: 2015-16, ID:112150305

BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Recommendation from the thesis supervisor:

13/07/2020

Mohammad Anwar Hossain

Associate professor & Head of the physiotherapy department.

BHPI,CRP, Savar, Dhaka-1343

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

Ref: CRP-BHPI/MRS/08/2020/401

Date: 17th August, 2020

Afroza Alam Shawon
4th year B.Sc. in Physiotherapy
Session: 2015-2016, Student ID: **112150305**
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of the thesis proposal **"Comparison between trigger point compression and trigger point release on upper active trapezius trigger point for mechanical neck pain** "by ethics committee

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

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

The purpose of the study is to find out comparison between trigger point compression and trigger point release on upper active trapezius trigger point for mechanical neck pain. The study involves use of a questionnaire to explore that may take 15 to 20 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 **8.30AM on 1st March, 2020 at BHPI (23rd 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

CRP
Centre for the Rehabilitation of the Paralysed
Centre for the Rehabilitation of the Paralysed (CRP)
Department of Physiotherapy
Head Office: CRP- Savar, CRP- Chapain, Savar Dhaka-1343, Bangladesh
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Ref: CRP/PT/2102/28/16.11.20 Date: 16.11.20

Conventional Physiotherapy for Mechanical Neck Pain

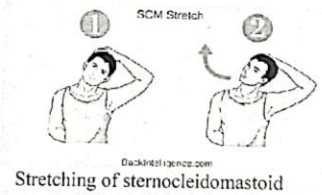
1.Patient education.

2. Range of motion exercises (Mackenzi Method)
   - Protraction
   - Repeated protraction
   - Retraction
   - Repeated retraction
   - Retraction with extension
   - Repeated retraction with extension

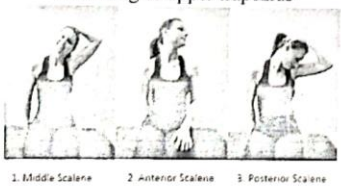
3.Motor control exercises:
   - Craniocervical flexor
   - Craniocervical extensor
   - Co-contraction of flexor and extensor
   - Retraining the strength of the superficial deep flexor synergy
   - Retraining of scapular muscles
   - Re-education of posture (Jull et al.,2004)

4.Stretching exercises:
   - Upper trapezius stretching
   - lavetor scapula stretching
   - Stretching of sternocleidomastoid muscle
   - Stretching of scalene muscle (Childs et al.,2004)

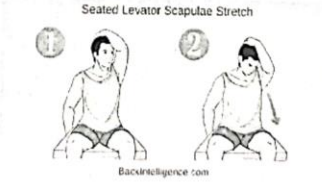
Stretching of upper trapezius



Stretching of sternocleidomastoid



Stretching of scalene



Stretching of lavetor scapula

CRP-Mirpur, Dhaka, Plot: A/5, Block- A, Section- 14, Mirpur, Dhaka- 1206, Tel: 02 9025562-4, Fax: 02 9025561, Email: dgm-mirpur@crp-bangladesh.org. CRP-Ganakbari, PO: Dhamsena, P.S: Ashulia, Savar, Dhaka, Tel: 02 7789227, Email: ganakbari@crp-bangladesh.org. AK Khan CRP- Chittagong, Kalurghat, Mohra, Chadgaon, Chittagong, Tel: 031- 2573412, Email: chittagong@ crp-bangladesh.org. Afsar Hussain CRP- Rajshahi, House no: 11, Mohishbathan, Rajshahi Court Rajpara, Rajshahi, Tel: 0721 771709, Email: rajshahi@crp-bangladesh.org. CARSA Foundation- CRP, Barisal, 12 Gonopara, Barisal Sadar, Barisal, Phone: 0431 71556, Email: barisal@crp-bangladesh.org. CRP- Moulvibazar, 836 Sayed Muztaba Ali Road, Poschim Bazar, Tel: 0861 52469, E-mail: moulvibazar@crp-bangladesh.org

Ref:

Date:

5.Strengthening exercises:

- Press your palm against your forehead. Resist with your neck muscles. Hold for 10 seconds. Relax. Repeat 5 times.
- Do the exercise again, pressing on the side of your head. Repeat 5 times. Switch sides.
- Do the exercise again, pressing on the back of your head. Repeat 5 times.

6.Mobilization & Manipulation

7.Mannual traction

8. Modalities:

- Ice
- TENS
- IRR

References:

Jull G, Treleaven J, Falla D, O'Leary S, 2004, A therapeutic exercise approach for cervical disorders. In: Boyling J, Jull G, editors, Grieves' modern manual therapy of the vertebral column,Edinburgh: Churchill Livingstone; 451–70.

Childs MJ, Fritz JM, Piva SR, Whitman JM,2004, Proposal of a classification system for patients with neck pain, Journal of Orthopaedic & Sports Physical Therapy, 34(11):686-700.

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