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"Physiotherapy Combined With Dry Needling Among Patients With Chronic Neck Pain: A Randomized Clinical Trial."

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"Physiotherapy combined with dry needling among patients with chronic neck pain: A Randomized clinical trial."

Submitted by **Sofiqul Islam** for partial fulfillment of the requirements for the degree of M. Sc. in Physiotherapy (M.Sc. in PT)

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Declaration

- This work has not previously been accepted in substance for any degree and is not concurrently submitted in candidature for any degree.

- This dissertation is being submitted in partial fulfillment of the requirements for the degree of M.Sc. in Physiotherapy.

- This dissertation is the result of my own independent work/investigation, except where otherwise stated. Other sources are acknowledged by giving explicit references. A Bibliography is appended.

- I confirm that if anything identified in my work that I have done plagiarism or any form of cheating that will directly awarded me fail and I am subject to disciplinary actions of authority.

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Acronyms

AROM	Active Range of Motion
ATrPs	Active trigger points
BMRC	Bangladesh Medical Research Council
BHPI	Bangladesh Health Professions Institute
CINP	Chronic idiopathic neck pain
CRP	Centre for the Rehabilitation of the Paralysed
CTHs	Chronic tension type headaches
CTTHs	Chronic tension type headaches
DDN	Deep dry needling
DN	Dry needling
DU	University of Dhaka
EWST	Extra corporeal shock wave therapy
IBR	Institutional Review Board
ICF	International Classification of Functioning, Disability, and Health
MTP	Myofascial trigger points
NDI	Neck disability index questionnaire
NPRS	Numeric pain rating scale
NSNP	Non- specific neck pain
PPT	Pressure pain Thresort
PROM	Passive Range of Motion
ROM	Range of Motion
SMT	Spinal manipulative treatment
TPs	Trigger points

Abstract

Background: Neck pain is a sensation of discomfort that can be felt anywhere from the base of the skull at ear level to the upper section of the back, shoulder, or arm. When a nerve root in both hands and just one is engaged, neck pain may also extend up to the finger. **Objective:** To find out the impact of combined therapy of dry needling and physiotherapy compared to the treatment effect of only physiotherapy among patients with chronic neck pain. **Methods:** This study was done through using assessor blinding randomized clinical trial. Forty patients with neck pain were randomly assigned to experimental (n=20) and control groups (n=20), 18 session of dry needling apply to intervention group and control group received conventional physiotherapy. Neck pain intensity measured with numeric pain rating scale (NPRS) and disability measured with Oswestry neck pain disability index questionnaire (NDI) before treatments and follow-up after 6 weeks. The findings were analyzed statistically considering a 5% significance level ($p \leq 0.05$). **Results:** There were significant improvements obtained between the experimental and control groups. The researcher also found that dry needling groups' improvement were more significant than the conventional groups**.** **Conclusion:** This study investigated that dry needling with physiotherapy and conventional physiotherapy was effective intervention in chronic neck pain. But dry needling group showed better improvement in all the aspect of patient with chronic neck pain.

Keywords*: Dry needling, physiotherapy, chronic neck pain, randomized clinical trials.*

CHAPTER-I INTRODUCTION

1.1 Background

Neck pain is a sensation of discomfort that can be felt anywhere from the base of the skull at ear level to the upper section of the back, shoulder, or arm. When a nerve root in both hands and just one is engaged, neck pain may also extend up to the finger (Sabeen et al., 2013). Musculoskeletal pain ranks third in terms of the highest number of years lived with disability globally (Bakken et al., 2021). Chronic or recurring pain is a common ailment, impacting 20% of the global population. Neck pain (NP) is a substantial factor in this category, since the problem persists or recurs in 19–37% of patients. Individuals with NP experience various negative outcomes, including an increased likelihood of taking time off work due to illness, a diminished capacity to handle daily activities, and a decline in both mental and physical well-being (Hakim et al., 2019). Sharp pain, neck stiffness, headache, difficulty moving the neck, radicular pain, difficulty holding items, and loss of hand function are some of the symptoms and indicators that are typically associated with neck pain. Neck discomfort has a 65% correlation with headache, 80% with upper limb pain, 64% with upper back pain, 39% with lower back pain, 31% with nausea, and 23% with dizziness (Cagnie et al., 2021).

Physical difficulties, such as musculoskeletal ailments, rheumatic diseases, genetic predispositions, psychological variables, and lifestyle behaviors, are commonly linked to persistent mechanical neck pain and chronic pain. Multiple authorities in the field of neck pain rehabilitation stress the importance of myofascial issues in the muscles of the neck and shoulder area. Myofascial pain syndrome is characterized by the presence of myofascial trigger points together with sensory, motor, and autonomic complaints (Sendarrubias, Rodriguez, Calvo & martin, 2020). Numerous etiological variables, such as persistent disc degeneration associated with aging, bad posture, anxiety, depression, neck strain, and athletic activity, can cause this illness. The primary symptoms include stiffness and discomfort in the neck, occasionally accompanied by numbness and radicular pain in the fingers, arms, and shoulders. Neck discomfort varies in incidence in a high-risk population from 10.4% to 21.3%, and its overall prevalence varies from 0.4% to 86.8%. According to a previous UK

survey, over two thirds of adults have had neck pain at some point in their lives. Its prevalence ranged from 15% to 17% in Hong Kong, while its lifetime prevalence ranged from 30% to 50% (Miao, Qiang & jin, 2018). Neck discomfort is a common musculoskeletal condition, with a point prevalence of 15% for men and 23% for women reporting symptoms. Five years after receiving their first diagnosis, research show that between 50% and 80% of people with neck discomfort still experience chronic issues (Llamas-Ramos et al., 2014). Pain in the neck that is limited to the cervical region, usually the lateral or posterior part, is referred to as neck pain. These can be mild to severe. The most common kind of neck pain is non-specific mechanical neck discomfort caused by daily activities, trauma, sprains or strains in muscles and ligaments. As per Hanvold (2015), bad posture can cause straining of the neck muscles. The era we live in is modernity. Technology is now more widely accepted than it has ever been in the modern age. In this place, it is rare to see someone without a smartphone. Rapid technological improvements, especially in the area of smartphone use, have had an impact on youth (Hoy et al., 2014).

Neck pain was common among the students in 86 cases (768.8%). Neck pain was more common in female students than in male students, with 51 (59.8%) against 35 (40.2%). The highest occurrence rates were seen in students who studied for extended periods of time (58.9%) and those who used computers or other electronic devices (63.4%). 45.5% of participants reported that their neck pain was brought on by spending so much time in class, and 67.9% claimed that poor ergonomics was to blame for their neck pain (Johora et al., 2016). According to Luime et al. (2015), neck pain is also related to psychological factors and a mechanical workplace. According to a study, neck pain is correlated with mechanical workload (Hamberg et al., 2006). Physical capability is one of the other equally significant elements. Non-modifiable variables include gender—particularly for women, who are at higher risk of neck pain because of their body types. The hyper activation of superficial neck flexors such the sternocleidomastoid and scalene muscles is one of the most frequently noticed in patients with neck pain, and there is evidence to verify this observation. The overuse of the affected muscles may cause trigger points (TrPs) to become triggered. The most common area of the neck and shoulder muscles where trigger points are engaged to create referred pain is the upper trapezius (Arias-Buria et al., 2020). A common type of cervical spine ailment, non-specific neck discomfort affects between 30% and 50%

of the general population. 10% of these individuals get persistent neck pain (Manafnezhad et al., 2019).

Approximately 80% of adults are projected to experience neck pain at some stage in their life. It is one of the musculoskeletal diseases that have a significant impact on people's ability to function worldwide. Neck pain can be attributed to various fundamental factors. Neck pain has multiple causes. The guidelines for dry needling offer contradictory recommendations. Canadian and Dutch guidelines do not endorse the use of dry needling for neck discomfort. However, U.S.A. recommendations support its use, citing a moderate level of evidence. Dry needling is more effective than sham needling for pain alleviation (Stieven et al., 2020). When an MTrP is present, which the patient knows well, they can elicit both referred and local pain. Furthermore, quick palpation or mechanical stimulation of the Myofascial trigger points with a needle can induce local twitch responses. Two non-pharmacologic treatment options for myofascial pain syndrome include myofascial release and dry needling. In both short- and midterm follow-ups, dry needling may be more successful in reducing pain than sham treatment (Stieven et al., 2021). The sedentary lifestyle that results from spending a lot of time in front of a computer is something that many offices frequently embrace. Musculoskeletal disorders brought on by the joints' constant tension as a result of poorly built office chairs and tables. Roughly 56% of sick days are attributed to musculoskeletal disorders that arise at work. Individuals suffering from occupational musculoskeletal disorders have experimented with a range of therapeutic modalities, including myofascial release massage, manual therapy, exercises, ergonomics, electrified splints, and multidisciplinary care (Tunwattanapong, Kongkasuwan & Kuptniratsaiku, 2015).

Myofascial trigger points, which are extremely sensitive areas inside a tense band of skeletal muscle, are the focus of dry needling. These trigger sites frequently play a role in the onset and maintenance of persistent cervical discomfort (Arias-Buria et al., 2020). Dry needling is a technique used to relieve pain, increase range of motion, and release muscle tension by inserting a thin, solid filament needle into these triggers sites. Dry needling stimulates the muscle's sensory nerves, which causes a neurophysiological reaction. According to Dormerholt et al. (2016), this stimulation has the power to reduce pain perception, increase endorphin production, and prevent pain signals from reaching the central nervous system. For those with chronic neck discomfort, dry needling's neurological effects help reduce pain and enhance

functional outcomes, increased oxygenation and blood flow, When dry needling, the insertion of the needle can cause a localized inflammatory response, which increases blood flow to the affected area. The damaged tissues receive more oxygen and nutrients as a result of the improved circulation. Increased blood flow promotes healing, lessens spasms in the muscles, and eases long-term neck pain (Infante et al., 2021). By focusing on particular trigger points and relieving tension in the afflicted muscles, dry needling encourages muscle relaxation. According to Stauber et al. (2018), a reduction in muscular tension leads to enhanced flexibility, a decrease in stiffness, and general relief from chronic neck discomfort. Dry needling can be used in conjunction with more conventional therapies like physical therapy and exercise as a complimentary strategy. Dry needling may improve the overall efficacy of the treatment plan for persistent neck pain when paired with traditional therapy (Yeganeh Lari et al., 2016). Dry needling's capacity to target myofascial trigger points, elicit neurophysiological reactions, enhance blood flow and oxygenation, and encourage muscular relaxation makes it a reasonable treatment option for persistent neck pain. For people who are looking for a helpful and evidence-based option to address the ongoing problems caused by chronic neck pain, dry needling can be a valuable part of an all-encompassing therapy approach. Cervical exercise is a useful treatment for neck pain (Grieve et al., 2013).

Multimodal training has been shown in a systematic study of patients with persistent neck pain to improve both function and discomfort. The effectiveness of manual therapy on neck pain samples with upper cervical joint dysfunctions has not been extensively studied in clinical trials. The upper cervical spine, which is essential to cervical function, undergoes more than 60% of cervical axial rotation. Populations with chronic neck discomfort and higher cervical dysfunction may have limited benefits from cervical exercise (Rodriguez et al., 2020).

1.2 Justification of the study

A randomized clinical trial is essential to the study of effectiveness of the dry needling in treating chronic neck pain patients from Bangladesh. The impact of chronic neck pain on the healthcare system of Bangladesh is immense so it is urgent to develop efficient treatment options. Clinically sound trials specific to comparing the effectiveness of the DN with CPT are not available so regarding the situation in Bangladesh. As per Hamburg et al. (2016), neck pain is becoming a prevalent musculoskeletal condition among youth. This kind of research is rare in our country, but it is extensively studied in another regarding the causes of mechanical neck pain. As a result, it's critical to determine the true reasons of mechanical neck pain in adult Americans. To find risk factors for neck pain, a number of studies have been carried out. Yet, the majority of these researches ignores individual traits, psychological and physical factors, and instead concentrates solely on one or a small number of elements. The identification of risk factors for chronic neck issues can aid in either primary or secondary prevention. Examining the relative efficacy of two popular methods for treating persistent neck pain, the study title tackles a critical problem in the field of medicine. The results of this study could expand our knowledge of the best treatments for this common ailment and enhance the quality of care and results for people with neck discomfort. Many people suffer greatly from the common and incapacitating ailment of chronic neck pain, which has a substantial impact on their quality of life. Pain reduction may not always be sufficient with traditional treatment methods including physical therapy, medication, and exercise. For treating persistent neck pain in such circumstances, alternative therapy approaches like dry needling have shown promise and efficacy.

1.3 Aim of the research:

To find out the combined effects of dry needling and physiotherapy compared with Conventional Intervention among patients with chronic neck pain.

1.4 Objective of the research:

1.4.1 General objective:

To find out the impact of combined therapy of dry needling and physiotherapy compared to the treatment effects of only physiotherapy among patients with chronic neck pain.

1.4.2 Specific objectives:

i. To explore the demographic characteristics of individuals with chronic neck pain.
ii. To identify improvement of pain intensity before and after treatment
iii. To find out the level of functional disability from chronic neck pain.
iv. To compare the efficiency of dry needling and conventional physiotherapy in the treatment of chronic neck pain.

1.5 Hypothesis of the study:

The study aims to find out the combined effects of physiotherapy and dry needling compared with Conventional Intervention among patients with chronic neck pain.

Null Hypothesis Ho: $1-\mu 2 = 0$ or $\mu 1 \geq \mu 2$, where the mean difference between the experimental and control groups is zero or the control group means more than the experimental group. Where the experimental group and control group initial and final mean difference is same, Dry needling method is no more effective for pain, disability in people with chronic neck pain.

Alternative Hypothesis Ha: $\mu 1-\mu 2 \neq 0$ or $\mu 1 \neq \mu 2$ when the average difference between the test group and the control group is different. Where the experimental group and control group initial and final mean difference is same, Dry needling method is effective for pain, disability in people with chronic 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 a sensation of discomfort that can be felt anywhere from the base of the skull at ear level to the upper section of the back, shoulder, or arm. When a nerve root in both hands and just one is engaged, neck pain may also extend up to the finger (Sabeen et al., 2013).

Chronic Neck pain

Chronic neck pain, also known as cervicalgia, is commonly characterized as persistent neck discomfort that persists for duration of more than three months. The most common origins of this condition are cervical disc problems, arthritis, or muscular inflammation.

Dry needling

The procedure of dry needling will be performed utilizing "solid filiform needles" with dimensions of 0.50 mm by 0.25 mm. The DN process will function in the following manner: The participants were instructed to lie in a prone position. Either alcohol or chlorhexidine will be utilized to cleanse the skin surface. The taut band is positioned above the MTrP and is found between the thumb and index finger. The solid filiform needle is inserted into a plastic guide tube. Taping will be utilized to insert the needle. In order to induce a slight muscular contraction referred to as an LTR, the needle was placed into the muscle enveloping the bundle and oscillated back and forth within the tissue. The needling will cease once LTR (long-term response) is triggered. After two or three stellate movements, needling will cease if no twitch is produced.

Trigger point dry needling

Trigger-point dry needling refers to the practice of using a fine needle, such as those used in acupuncture, to enter the skin and muscle. It is an activity that intrudes or encroaches onto something. It follows myofascial trigger points, which are contracted bands of skeletal muscle that appear to be overly sensitive and can be detected as little lumps. Trigger point dry needling can effectively treat both deep tissue and superficial tissue levels.

Cervical spondylosis

Cervical Spondylosis is one of the most common degenerative conditions of the spine results from the deterioration of the facet joints and cervical intervertebral discs. The mobility and force transfer between neighboring vertebrae are made possible by these connecting connections. Myelopathy and/or radicular symptoms frequently occur when osteophyte development impairs the canal diameter. Increased pressure on the spinal cord is the cause of these symptoms, which result in alterations to the nervous system and blood vessels. A comprehensive understanding of the biomechanics and pathophysiology of cervical spondylosis is necessary for its clinical therapy (Jeffrey et al. 2011).

Pain

Pain is an unpleasant sensory and emotional response to real or potential tissue injury, and it is both complicated and subjective. Its effects on an individual's quality of life and day-to-day functioning might vary from mild pain to severe, incapacitating sensation. Pain is classified into two main categories: acute and chronic. Acute pain is the type of suffering that appears out of the blue and goes away as soon as the underlying cause is treated. Once the underlying problem is resolved, it usually fades away. In contrast, chronic pain lasts for months or even years, and its causes might be anything from a medical ailment or injury to nerve damage or a history of emotional or psychological trauma.

Physiotherapy

Physiotherapists, also known as physical therapists, strive to reduce their patients' discomfort and help them regain their previous degree of physical function. Physiotherapists are educated to treat a broad range of conditions in people of all ages, from acute trauma to chronic pain or arthritis. Physiotherapists use a variety of techniques to help their patients achieve their goals and improve their physical performance. These techniques include physical therapy, exercise, ultrasound or electrical stimulation, and teaching proper posture and body mechanics. Physiotherapy reduces the chance of further sickness or injury while simultaneously restoring or maintaining a patient's physical function and quality of life.

Rehabilitation

Rehabilitation helps people who have been sick, hurt, or disabled get back to, or even go beyond, the level of physical, mental, and social functioning they had before they became disabled. Physical therapy, occupational therapy, speech therapy, and cognitive therapy are just a few of the many techniques and methods that can be used in rehabilitation. Assisting the patient in regaining as much practical independence as possible will allow them to return to a normal life as much as possible. A traumatic brain injury, multiple sclerosis, Parkinson's disease, stroke, spinal cord injury, amputation, and many other diseases and injuries need rehabilitation. People who have had surgery or other medical treatments that change their physical or mental state may also need rehabilitation. While someone is in rehabilitation, the healthcare team, which includes doctors, nurses, therapists, and social workers, works together to make a specific treatment plan. Plans for treatment may include therapy, medication, assistive technology, and changes to the person's surroundings or behavior.

Functional disability

The term "functional disability" or "diversity" replaced "special needs," "disability," "impairment," and "handicap" in scientific writing in Spain in 2005 at the urging of persons with first-hand experience with the condition. A person with a functional disability has considerable limitations in one or more of the following areas: mobility, sensation, cognition, independence, caregiving, technology, and exercise.

Conventional Physiotherapy

In the Musculoskeletal physiotherapy unit, conventional physiotherapy plays a vital role in fostering optimal physical development, function, and mobility among patients dealing with conditions such neck pain. Tailored treatments are specifically designed with each patient according to requirement. Manual therapy techniques and play-based activities are utilized to enhance joint mobility, increase muscular flexibility, and decrease pain. These therapeutic approaches not only address to decrease pain but also promote functional activity and participation, supporting comprehensive management and well-being in all patients.

CHAPTER-II LITERATURE REVIEW

Neck pain is a common musculoskeletal issue, with a point prevalence of 15% in men and 23% in women.23. Studies have shown that at a 5-year follow-up, between 50 and 80 percent of patients with neck discomfort had persistent symptoms (Llamas-Ramos et al., 2014). According to Stieven et al. (2020), one in every eight people will experience neck pain at some point in their lives, making it one of the musculoskeletal disorders that most seriously hinder people globally. Up to 67% of people worldwide may have chronic, non-specific neck pain at some point in their lives. Individuals with chronic pain often require medical care and prescription drugs to manage their discomfort, and there is a connection between their incapacity to function and their disability. It is considered a public health issue because it commonly leads to absenteeism from work, which has serious socioeconomic repercussions (Cerezo-Tellez et al., 2018). According to the International Association for the Study of Pain, neck pain is among the most common excuses for missing work. Myofascial trigger points have been suggested as a possible cause of mild mechanical neck discomfort with musculoskeletal origins (Segura-Orti et al., 2016). In the last two to three decades, dry needling has been widely used to treat people with either acute or chronic muscle pain. Though the precise mechanism of therapeutic efficacy remains unclear, it most likely functions in a manner akin to acupuncture in the treatment of pain. According to Tsai et al. (2010), overstimulation analgesia. As many as 71% of middle-aged and highly productive adults in industrialized countries suffer from neck discomfort, one of the most common musculoskeletal disorders (Fernandez-Carnero et al., 2017). In Bangladesh, neck pain was reported by 21.4% of COVID-19 survivors overall. Just 8.9% of non-COVID-19 participants reported having neck pain (Ali & Mehjabin, 2023). The overall population has a documented prevalence of persistent neck discomfort of 2.2%. Prolonged neck pain has been tightly linked to psychological distress and impairment. A central sensitization has been proposed as one of the key mechanisms linked to the psychological discomfort. Therefore, it's imperative to assess the patient's mental well-being in addition to their physical functioning, since the two may be connected (Fejer et al., 2016). Trigger points (TrPs) sometimes result in referred pain, stiffness, and soreness in the muscles (Dommerholt

et al., 2016). Chronic neck pain is a severe medical and social problem that can cause excruciating pain and a reduction in one's ability to function, according to Blond (1987) and Bovim et al. (2015). Cervical spine mobility restriction and pain are often linked (Hagen et al., 2016). Upon physical examination, hyperirritable regions inside taut bands of skeletal muscle are identified as TrPs. These regions elicit characteristic referred pain, feel uncomfortable when compressed, and lead to motor dysfunction and autonomic problems (Donnelly, 2019). Latent TrPs (LTrPs) and active TrPs (ATrPs) are the two categories of TrPs from a therapeutic standpoint. According to Lucas et al. (2010), ATrPs can result in both motor dysfunction (stiffness and reduced range of motion) and sensory complaints, but LTrPs can only produce motor dysfunction when they are engaged. Moreover, the motor dysfunction may lead to irregular activation of synergist muscles, which could impede the use of motor control strategies and cause pain to spread geographically (Ge et al., 2014). According to Gattie et al. (2017), sensitivity to pressure pain refers to the capacity to identify a patient's pain when applying pressure. LTrPs and ATrPs have been found to exhibit higher in earlier studies. Dry needling (DN), seen as an effective choice for treating TrPs, is a frequently employed method in clinical practice (Infante et al., 2021). DN was defined by the American Physical Therapy Association as "skilled intervention using a thin filiform needle to penetrate the skin that stimulates TrPs, musculature, and connective tissue for the management of neuromusculoskeletal disorders" (American Physical Therapy Association, 2013). One of the most often used techniques is "fast in and out" needle insertion into the muscle containing the Trigger points (Shah et al., 2015).

Even though the exact physiological mechanisms of diabetic neuropathy are still unknown, Shah & Gilliams (2018) discovered that there was an immediate decrease in the peripheral concentrations of neurotransmitters, including substance (calcitonin gene related peptide) and several cytokines and interleukins in the extracellular fluid of the muscle TrP following needle insertion. Moreover, it is advantageous in decreasing the threshold for discomfort from pressure (Gattie et al., 2017). It has been shown that DN improves functional outcomes by modifying the chemical mediators associated with pain and inflammation (Hsieh et al., 2017). Therapists often use dry needling in practice to reduce pain in ATrP; however, it is usually not done if spontaneous pain is absent in LTrP. Additionally, because previous studies have shown that needling causes inflammation in the muscles,

therapists usually advise their patients not to do any physical activity for the 24 to 48 hours after dry needling (Baraja-Vegas et al., 2019). DN has the potential to significantly affect not only pain but also the mechanical and contractile properties of the treated muscle in a clinically meaningful way. DN therapy on ATrPs and LTrPs may change the mechanical and contractile properties of the muscle in ways that are associated with better clinical outcomes, per some study (Baraja-Vegas et al., 2019). As such, the aim of this investigation was to evaluate the effects of DN and a placebo on the LTrP of the upper trapezius (UT) muscle with respect to the muscle's mechanical and contractile properties as well as pressure pain perception (Oliveira-Campelo et al., 2013).

Dry needling has impacts on the vascular, metabolic, mechanical, and neurophysiological systems. According to research, dry needling can help reduce pain, disability, and limitations in range of motion (ROM) while also increasing pain pressure thresholds. In a randomized trial including 65 patients with nonspecific low back pain, Griswold et al. (2020) contrasted non-thrust manipulation (NTM) with segmental and distal dry needling without needle manipulation after 6 sessions spread over 3 weeks. The outcome measures that were employed were the Oswestry Disability Index (ODI), Patient Specific Functional Scale (PSFS), Numerical Pain Rating Scale (NPRS), and PPT (Brennan et al., 2020).

The popular technique used by physical therapists to treat patients with neck pain dry needling is not supported by clinical practice standards. The continuation of dry needling performed outside of guidelines is likely due to the conflicting results of research on the practice, rather than any evidence supporting its utility. More compelling evidence supporting the efficacy of dry needling in addressing symptoms related to neck stiffness has surfaced in recent years. Indeed, an updated meta-analysis found low to moderate evidence supporting a moderate therapeutic effect of dry needling for reducing pain-related disability and neck pain in people with trigger point-related neck pain in the short term, but not in the middle or long term (Ortega-Cebrian et al., 2016).

Although this is not fully understood, the theory behind dry needling for neck pain patients is based on finding and targeting TrPs in the neck muscles that can mirror the patient's symptoms. A number of mechanisms, including a decrease in spontaneous electrical activity, an increase in muscle oxygenation and blood flow, a reduction in pro-inflammatory and algogenic mediator levels, stimulation of peripheral nerve

fibers, and the release of endogenous opioid and neurotransmitter, suggest that dry needling may be helpful for patients with neck pain (Donnelly, 2019). The reasons behind the variations in clinical outcomes following a given treatment are multifaceted and can be linked to various factors such as the natural history of the disease, regression to the mean, the specific treatment effect (which relates to the underlying mechanisms of the intervention), and nonspecific effects (which include placebo and nonplacibo effects). More recently, Fernandez and Nijs have drawn attention to how patients' expectations and a possible placebo effect may play a part in the underlying mechanics of dry needling. Patients' expectations, one of the nonspecific impacts, can have a major influence on clinical treatment outcomes; this is a trait that is often overlooked in physical therapy interventions (Gallego-Sendarrubias, Rodriguez, Calvo & martin, 2020).

Treating trigger points with dry needling has become popular recently. Using a needle, the dry needling trigger point is deactivated. It is an invasive operation since the needle is inserted into the MTrP through the muscle and skin. Its therapeutic efficacy is unknown, though, as there are no objective methods to measure trigger point conditions or discomfort. Therefore, objective and reliable assessments need to be devised in order to assess the effect of dry needling therapy on tissue morphologic features with MTrPs that correspond with physical findings and discomfort (Rezaeian et al. 2020).

Bernal –utrera et al. (2020) conducted a study regarding Three times a week, manual therapy and therapeutic exercise were compared in a randomized controlled trial for nonspecific chronic neck pain. Follow-up assessments were taken one, four, and twelve weeks after the treatments. In the event that any differences were discovered between the experimental and control groups, they were not considered statistically significant. The researcher did find, however, that whereas hand treatment alleviated perceived pain before therapeutic exercise did, the latter reduced cervical impairment first. Luis martin et al. (2022) conducted Patients with persistent neck discomfort were grouped according to the presence or absence of a latent myofascial trigger point (MTrP) in this randomized clinical experiment. Comparing the effects of deep dry needling on MTrP regions on pain relief and cervical impairment was the study's main objective. A total of 65 patients were divided into three groups: non-MTrP-DDN, active-MTrP-DDN, and latent-MTrPDDN. The administration of both latent and

active MTrPs was associated with the patient's discomfort being reproduced. Patients with neck pain report improved pain alleviation one week and one month after the intervention when DDN is administered to an active MTrP in the upper trapezius muscle as opposed to latent MTrPs or outside of MTrPs.

Stieven et al. (2021) study on The impact of dry needling and myofascial release on the threshold for local and widespread pressure pain in patients with active upper trapezius trigger points Instantly: In patients with persistent neck pain, the study examined the immediate effects of one dry needling session, myofascial release (MR), and sham dry needling on pressure pain threshold (PPT) and neck pain severity. In this randomized therapeutic trial, there was no significant interaction for PPT in the UTM between the treated and contralateral sides. One application of dry needling or magnetic resonance imaging (MR) induced both local and distant hypalgesic reactions that were more effective than placebo. Haładaj, Pingot & Topol, (2017) conducted the study that was carried out was titled Saunders Traction Device and High-Intensity Laser Therapy: An Effectiveness of Cervical Spondylosis Therapy: A Randomized Controlled Trial. The results of both therapies were found to be similar four weeks after therapy and immediately after. However, in long-term follow-up, the HILT strategy greatly improved the maintenance of good therapeutic outcomes.

Gallego-Sendarrubias et al. (2018) conducted an investigation on the efficacy of dry needling in addition to manual treatment for those with chronic mechanical neck pain. This study involved 101 participants with continuous mechanical neck pain who were divided into two groups for a randomized, single-blind clinical trial: the intervention group (DN+MT) and the control group (SDN+MT). The individuals received therapy in two sessions. For the intervention group, DN was administered in addition to MT to the most mechanosensitive myofascial trigger point (MTrP). Both MT and SDN were administered to the control group. The results show that DN+MT is highly superior than SDN+MT in reducing pain intensity, PPT, neck disability, and cervical range of motion in people with chronic mechanical neck pain. Manafnezhad et al. (2019) conducted the effects of shock wave therapy and dry needling on active trigger sites of the upper trapezius muscle in patients with nonspecific neck ache are investigated in this study. A single-blind, randomized clinical trial was conducted to examine the effects of dry needling (DN) and extracorporeal shock wave therapy (ESWT) on the upper trapezius muscle trigger point in individuals with non-specific neck discomfort.

Seventy patients with active MTrPs in the upper trapezius muscle and NSNP were randomly randomized to two groups: one for dry needling and the other for ESWT. Every week for three weeks, a pertinent intervention was given to each participant. ESWT or dry needling is two treatment options for MTrPs of the upper trapezius muscle in patients with NSNP. Valiente-Castrillo et al. (2020) a randomized clinical trial on the use of dry needling and pain neuroscience education in the treatment of patients with persistent myofascial neck pain was carried out. After sixty patients were randomly selected and divided into three groups, they received either six sessions of DN plus three sessions of PNE (TrPDN PNE group), six sessions of DN alone (TrPDN group), or ten sessions of normal treatment. Reducing chronic non-specific neck discomfort and disability after a 3-month follow-up was easier with DN alone than with CUC.

Llamas-Ramos et al (2014) conducted on an analysis The effectiveness of trigger point dry needling vs. trigger point manual therapy in the short term for treating persistent mechanical neck pain was investigated in a randomized clinical trial. The aim of this study is to evaluate the effects of trigger point dry needling (TrP-DN) and trigger point manual treatment (TrP) on patients' function, discomfort, pressure pain sensitivity, cervical range of motion, and overall pain. Patient groups comprising ninety-four were randomized to receive manual therapy or TrP-DN. The groups were evaluated at baseline, immediately following treatment, and at the one- and two-week checkpoints. According to the results of this clinical study, two sessions of manual TrP treatment and TrP-DN generated similar outcomes in terms of pain, disability, and cervical range of motion. People in the TrP-DN group stated that their levels of

This study investigates the effectiveness of deep dry needling myofascial trigger points in patients with chronic, non-specific neck pain. This clinical investigation is single blinded and randomized. The study included thirteen people who had active MTrPs in their cervical muscles along with non-specific neck ache. Randomization was used to assign these participants to receive deep dry needling in addition to stretching, or stretching alone (control group). Over the course of two weeks, four therapy sessions were conducted, and then there was a six-month follow-up. There were significant and clinically significant changes in every case that supported dry needling (Cerozo tellez et al., 2016).

Voogt et al. (2023) conducted a research on In patients with chronic idiopathic neck pain, a single-blinded, randomized clinical trial looked at the immediate effects of dry needling on pain sensitivity and pain modulation. To compare the immediate effects of one dry needling (DN) and sham needling (SN) session on local and distant pressure pain thresholds and conditioned pain modulation in individuals with chronic idiopathic neck pain. The statistical analysis includes 54 persons in all. A linear mixed model analysis revealed no significant interaction effects for any of the outcome measures.

Brennan et al. (2020) conducted a randomized controlled trial comparing the rate of improvement of pain and disability in Myofascial Pain Syndrome (MPS) between Dry Needling (DN) and Dry Needling with Intramuscular Electrical Stimulation evaluated the effects of dry needling alone versus dry needling combined with IMS. Forty-five individuals were randomly assigned to either the DN/IMES or dry needling group. After receiving six consecutive weekly treatments, each of the two groups completed the NDI and NPRS questionnaires in weeks 0, 3, 6, and 12. DN and DN/IMES demonstrated pain and disability decrease and maintenance for six weeks. At weeks six and twelve, there were no differences in the groups' improvement in terms of pain or impairment. According to Dormerholt et al. (2016), trigger points (TrPs) are frequently the source of muscular sensitivity, discomfort, and transferred pain. Trigger points, which are hyperirritable areas inside taut bands of skeletal muscle that produce distinctive referred pain, feel uncomfortable when compressed, and cause motor dysfunction and autonomic abnormalities, can be found physically (Donnelly, 2019).

There are two varieties of TrPs from a therapeutic perspective: latent and active. Latent trigger points can only result in motor dysfunction when they are activated, whereas active trigger points can produce both motor dysfunction and sensory complaints (Ge & Arendt-Nielsen, 2011). Additionally, irregular muscle activation of synergists resulting from this motor dysfunction may cause insufficient motor control techniques and the transmission of spatial discomfort (Ge et al., 2014). According to Donnelly (2019) and Gattie et al. (2017), sensitivity to pressure pain is the ability to identify a patient's pain when applying pressure. Most persons who experience severe or persistent pain can benefit greatly from physical activity. Further evidence has shown that a number of passive therapies are effective in reducing pain and benefiting this patient group. New guidelines for the treatment of chronic neck pain recommend

multi-modal care, which includes high-dose massage, manipulation, mobilization, stress self-management, soft tissue therapy, supervised group exercise, supervised yoga, supervised strengthening exercises, or at-home exercises (Lucas et al., 2013).

In clinical contexts, dry needling is a frequently employed treatment that presents a promising therapeutic approach for treating trauma patient populations (Trope et al., 2021). "Dry needling" is described by the American Physical Therapy Association (APTA, 2013) as a skillful technique that involves making tiny filiform needle punctures in the skin. This method works to activate the nerve, muscle, and connective tissue in order to treat neuromusculoskeletal conditions. A popular method is to "fast in and out" while inserting a needle into the muscle at the trigger spot. To what extent the physiological mechanisms underlying DN are effective is still unknown (Sanchez-Infante et al., 2021). Mechanical neck pain is the term for pain in the neck brought on by extended postures or particular movements of the cervical spine. This description does not apply to neural symptoms. After all, this musculoskeletal disorder affects 50% of the population in Western countries at some point. According to the previous year's Spanish National Health Survey, 18% of participants reported having mechanical neck pain. According to Gallego-Sendarrubias et al. (2020), neck discomfort is thought to be the fourth most common cause of disability, behind joint pain, depression, and low back pain.

Neck pain comes in fourth in the US for years lived with disability, after musculoskeletal disorders, major depressive disorders, and low back pain. In adults, 6%–22% experience neck discomfort. 48.5% of Americans say they have had neck pain at some point in their life, compared to 7.6% who report having it now. Myofascial tissues, zygapophyseal joints, and cervical intervertebral discs can all cause pain. Consequently, dry needling is suggested for the short- and medium-term alleviation of neck MTrP discomfort. Deep dry needling involves inserting solid filiform needles into the MTrP without the use of analgesics. Trigger point dry needling has been demonstrated to improve neck disability, pain, range of motion, and neck muscle strength in large patient samples with persistent neck discomfort. Deep dryness may be caused by malfunctioning motor endplates in the peripheral nervous system failing mechanically

Dormerholt et al. (2016) study on a typical treatment for those with neck discomfort who wish to control their symptoms is physical therapy. In actuality, the initial course of treatment for those with mechanical neck discomfort is typically physical therapy. When working with this population, physical therapists employ a variety of therapies, such as traction, therapeutic exercise, manipulation and mobilization, as well as additional modalities like electrotherapy or education (Llamas-Ramos et al., 2014). An invasive procedure called deep dry needling is used to treat myofascial trigger points. Myofascial trigger points and Myofascial pain syndrome appear to respond well to deep dry needling; however, a number of systematic reviews have suggested that additional high-quality research is required before DDN therapy is advised. According to several recent clinical investigations (Cerezo-Tellez et al., 2016), deep dry needling of Myofascial trigger points improves pain joint range of motion (ROM) and pressure pain threshold (PPT) over Myofascial trigger points in the treated muscles, and it has the same effects over pain and PPT in Myofascial trigger points located in the referred pain location. The main symptoms of Cervicogenic headache include limited cervical range of motion, pain triggered by external pressure over the ipsilateral upper neck, one-sided head discomfort without side-shift, and the inability to halt episodes owing to various difficult or lengthy neck movements (Dunning et al., 2021).

One potential reason for persistent idiopathic neck discomfort is myofascial pain syndrome (CINP). Active or latent myofascial trigger points might result in CINP and muscular soreness. Dry needling is a popular technique for treating myofascial trigger points. Dry needling has been shown to have both mechanical and local effects; however, the consequences on central neurophysiology remain unclear and require further investigation. Dry needling may lessen central nervous system excitability in patients with chronic pain, according to preliminary research (Niddam et al. 2018) reported in an MRI investigation that suggests the brainstem's periaqueductal grey substance mediates pain after dry needling, suggesting that dry needling activates enkephalinergic inhibitory dorsal horn interneurons. In contrast to sham needling, Stieven et al. (2020) observed that dry needling in CINP increased both local and distant PPTs. Studies examining the effect of DN on PPTs and CPM are scarce. It is among the most often disregarded illnesses that lead to difficult-to-treat headaches. There are records of chronic tension-type headaches everywhere in the world. Physiotherapy is the most commonly used non-pharmacological treatment for chronic

tension-type headaches. Myofascial TrPs can lead to discomfort and dysfunction, but orthopedic and sports physiotherapists have been treating these problems with dry needling for a long time. Nevertheless, the evidence is insufficient to justify the use of dry needling to treat tension-type headaches that are chronic (Gildir et al., 2019).

Research has indicated that dry needling can effectively increase pain thresholds while reducing discomfort, disability, and range-of-motion limitations (Brennan et al., 2020). Chronic neck pain has been intimately linked to psychological discomfort and disabilities. Certain theories suggest that central sensitization is a significant process related to the psychological discomfort. It is important to assess the patient's mental state in addition to their physical function because there may be a connection between the two (Ceballos-Laita et al., 2022).

Neck pain is among the top three musculoskeletal problems. Seventy percent of the population is affected, making it the fourth most common cause of disability years; little has changed in recent decades. Most persons who experience neck pain may experience a relapse of symptoms three to five years later. 45% of patients with chronic neck pain are seen by general practitioners each year; of these, one-third are referred to paramedical or medical specialists, and the bulk of the patients receive conservative treatment, which consists of prescription drugs, physical therapy, and other modalities. Most cases of neck pain are soft tissue, mechanical, nonspecific, and do not involve structural diseases. Numerous intricate physical and psychosocial aspects affect the prognosis (Cholewicki et al., 2022).

Musculoskeletal discomfort is the third most common cause of disability worldwide. In the coming years, it is expected that life expectancy will increase internationally and that conditions in middle-class and low-income countries would get worse. Around the world, 20% of people experience persistent discomfort. In 19–37% of instances, persistent or recurrent neck pain is a contributing factor to this category (Bakken et al., 2021). In cervical radiculopathy, a common ailment, the spinal nerve or nerve roots malfunction as a result of mechanical compression or inflammation. Epidemiological data on cervical radiculopathy are scarce. A comprehensive population-based study conducted in Rochester, USA by Radhakrishnan et al. (1994) found that between 1976 and 1990, 83.2 occurrences of cervical radiculopathy per 100,000 people were documented. 1.79 cases of cervical radiculopathy per 1000 person-years were discovered in a recent US military study. Cervical radiculopathy was found in 4.2% of Saudi Arabian patients with neck problems between 2011 and

2013. Cervical radiculopathy is brought on by chemical or mechanical compression of the cervical nerve roots. Foraminal stenosis, which is brought on by osteoarthritic changes in the cervical spine joints, is more common than disc herniation. Disc degeneration results in decreased foraminal height and osteophyte output. Infection, tumor, and trauma reduce the intervertebral foramen (Lari et al., 2016).

Pain in the neck and upper limbs, muscular weakness, abnormal sensations, and slowed reaction are all symptoms of cervical radiculopathy. Prior studies have demonstrated that cervical spine mobilization and manipulation improved neck function, function, and discomfort in patients with cervical radiculopathy. studies using dry needling to treat patients with cervical radiculopathy who have persistent neck pain. For this reason, clinical dry needling for chronic cervical radiculopathy was compared in this RCT. to ascertain whether cervical radiculopathy patients' chronic neck discomfort can be relieved by dry needling (Alshami & Bamhair, 2021). An increasing number of workers are experiencing neck discomfort, which leads to excessive sick absence and lost productivity. Neck pain is a leading cause of disability globally. Its prognosis depends on clinical, psychosocial, and individual factors. Research indicates that low-level laser therapy, acupuncture, mobilization, manipulation, education, training, and analgesics may offer temporary benefits (Skillgate et al., 2020).

CHAPTER-III METHODOLOGY

3.1 Study design: This study was done through using single blinding randomized clinical trial. Clinical trial was conducted from July 2023 to may2024. Methodology was choice to meet the study aim as an effective way to collect data.

3.2 Study site: Physiotherapy department of the Dr Amjad Hossain specialized physiotherapy and rehabilitation center, Nabinagar, Brahmanbaria and central Lab hospital Brahmanbaria. Study site at Dr Amjad Hossain specialized physiotherapy and rehabilitation center, Nabinagar, Brahmanbaria and central Lab hospital Brahmanbaria was choose because of dry needling practice in CRP were not available.

3.3 Study population:

People who attended the Dr Amjad Hossain specialized physiotherapy and rehabilitation center, Nabinagar, Brahmanbaria and central lab hospital brahmanbaria, with chronic neck pain. (At list 3 months of duration).

3.4 Study period: From July 2023 to May 2024.

3.5 Sampling technique: This research was used of the simple Random Sampling method. Participants who fulfilled the study's inclusion requirements were randomly selected as the sample. Forty patients suffering from chronic neck pain were chosen from the Dr. Amjad Hossain specialized physiotherapy and rehabilitation Centre and central Lab hospital, brahmanbaria; from there, 20 participants were randomly assigned to the experimental group, where they received physiotherapy with the addition of dry needling, and 20 participants were assigned to the control group, where they received conventional physiotherapy alone. The samples in the control group were labeled as C1, C2, C3, C4 etc. Where as those in the experimental group was labeled as E1, E2, E3, E4 etc. A single-blind method was used in the investigation.

3.6 Sample size:

It's tough to determine the optimal sample size because it varies heavily on the type of study being conducted. Planning was the key to success in any statistical study. The study's sample size should be sufficient in light of its aims. The study's sample size should be "big enough" to ensure that any effect large enough to be scientifically significant is also statistically significant. For calculating sample size, we have used the below parameters

$$N = 2 \times (\frac{z1 - \alpha + z1 - \beta)2}{d} \times p \times (1 - p)$$

Here, Z (confidence interval) = 1.96

P (prevalence) =15% (Ali & Mehjabin, 2023)

And,

q= (1-p)

= (1-0.15)

= 0.85

d= 0.05

The actual sample size was, n=78 (78.5).

The actual sample size for this study was calculated as 78. As this study performs as a part of the academic research project there were time frame limitations, the higher number of sample was difficult to achieve. So, 40 chronic neck pain patients were taken as the sample for this study. 20 were control group & 20 were experimental group.

3.7 Selection criteria

3.7.1 Inclusion criteria:

- Age 18-65 years of old experiencing chronic neck pain (Jordon, Konstantinou, & Dowd, 2009).
- With or without hand pain for a minimum of three months were considered eligible for the study.
- Both male and female were included (Alkhawajah, & Alshami, 2019).
- Patients who were received physiotherapy from the CLH & Dr. AHSPC brahmanbaria.

3.7.2 Exclusion criteria:

- Absence of neck pain and limited movement in the cervical region
- Others spinal conditions such as, fractures, tumors, infections, rheumatic disease
- Pregnancy
- Implanted cardiac pacemaker
- Blood clotting disorders
- Use of anticoagulant medication
- Steroid therapy
- Metal implants in the treatment area
- Sensory disturbances
- Mental health disorders
- Cancer
- Changes in the skin at treatment site, viral or bacterial infections
- Fever, exhaustion
- Uncontrolled high blood pressure
- Fear of needles or refusal to give consent for the procedure.

3.8 Consort flowchart

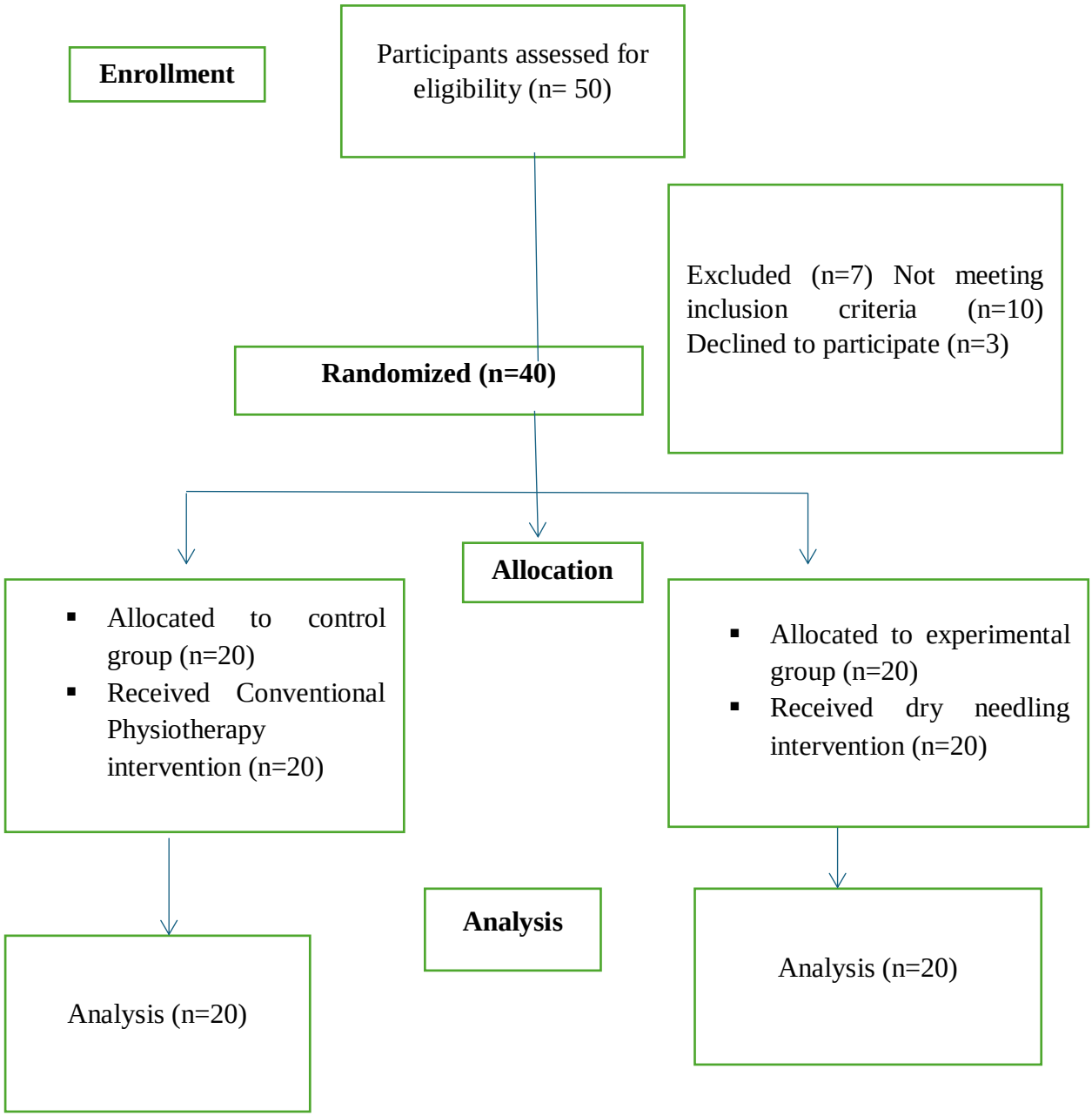


Figure 3.8: Consort flowchart

3.9 Methods of data collection:

The data collection procedure was conduct through initial assessment, treatment and outcome was measured after six (06) weeks. Investigator was trained for data collection where the subjects and assessors were blind.

3.9.1 Data collection tools

The Bengali Consent form and questionnaire were required, as well as a pen, pencil, eraser, clipboard, white paper, and a notebook.

3.9.2 Questionnaire:

The questionnaire was developed under the advice and permission of the supervisor following certain guidelines. The interviewer was asking face to face interview from the structured questionnaire which was designed to collect information on related points.

3.9. 3 Measurement tools

3.9.3 Numeric pain rating scale (NPRS)

The numeric pain rating scale (NPRS) is a unidimensional assessment tool used to gauge adult pain, especially chronic pain. A respondent chooses a whole number (0–10 integers) on the NPRS, a segmented numerical version of the visual analog scale (VAS) that most accurately represents the degree of their suffering. A line or bar that is horizontal is the standard format. The NPRS is anchored by phrases that describe extremes of pain severity, just like the VAS. The 11-item NPRS is the most widely used version, while there are other variations. Although the questions vary, the most typical ones inquire about average pain intensity or pain intensity "in the last 24 hours." The NPRS may be given orally, which includes over the phone, or graphically for self-completion. As previously indicated, the respondent is asked to select the segmentation scale number that most accurately represents the degree of their pain.

3.9.3 Oswestry Neck disability index questionnaire (NDI)

The Oswestry neck pain questionnaire was updated to become the Neck Disability Index, which is used to gauge how well persons with neck pain are able to go about their daily lives. It is helpful in research settings as well as clinical practice. The Neck Disability Index is a five to ten minute paper-and-pencil test that takes around five minutes to score. An ordinal scale of five points is used to score each section. A total score is obtained by adding the scores from each component. A high score denotes a significant degree of functional handicap brought on by neck pain.

3.9.3.1 Primary outcomes

The primary outcomes, measured before treatment, and average pain intensity (in the previous 24 hours) measured with a numerical pain rating scale (NPRS), and disability measured with the Oswestry Neck disability index scale. (Higher score was more disability).

3.9.3.2 Secondary outcomes:

The secondary outcomes, measure after 6 weeks of treatment, and average pain intensity (in the previous 24 hours) measured with a numerical pain rating scale (NPRS), and disability measured with the Oswestry Neck disability index scale.

3.10 Data collection:

The data collection procedure was conduct through initial assessment, treatment and outcome was measured after six (06) weeks. Investigator was trained for data collection where the subjects and assessors were blinded. The data was gathered via closed-ended face to face interviews and questionnaires with predetermined answers. As a result of the flexibility it provided in its questions and answers, the structural questionnaire proved useful to the researcher in gathering all the necessary data. To get to the truth about every facet of the participant, the researcher created a structured, close ended questionnaire to collect data on socio-demographic characteristics. Individual questionnaire items followed, with some wording twists made to better align with the issues under investigation.

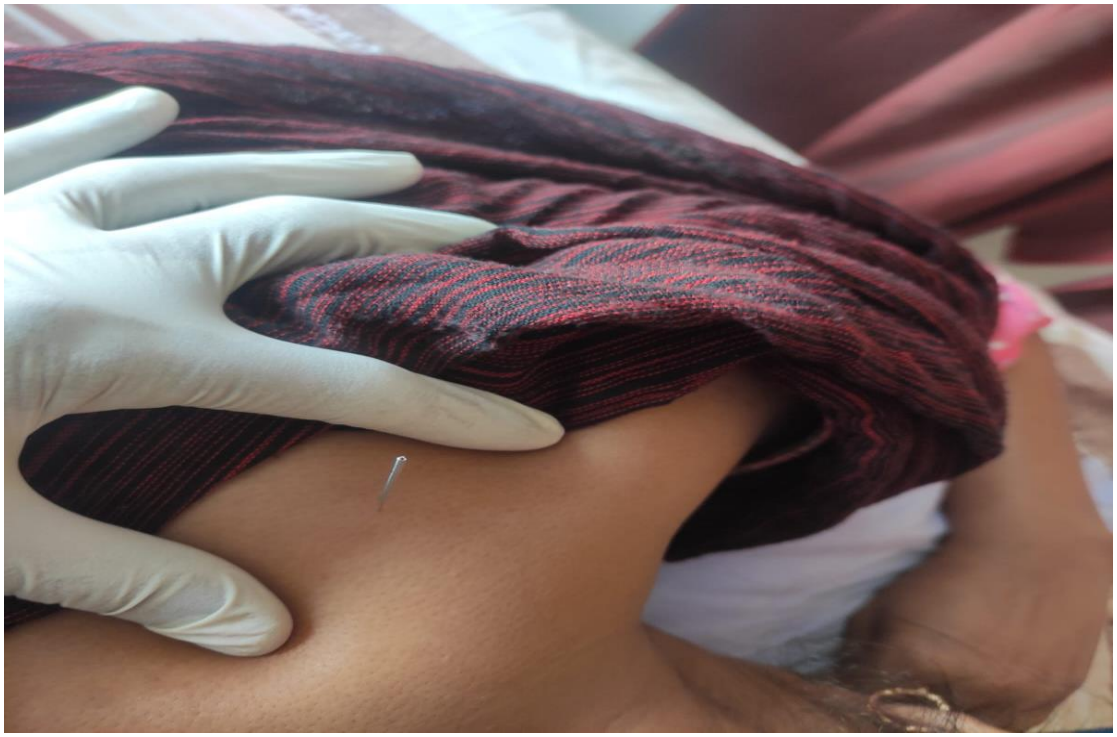
3.11Treatments protocol:

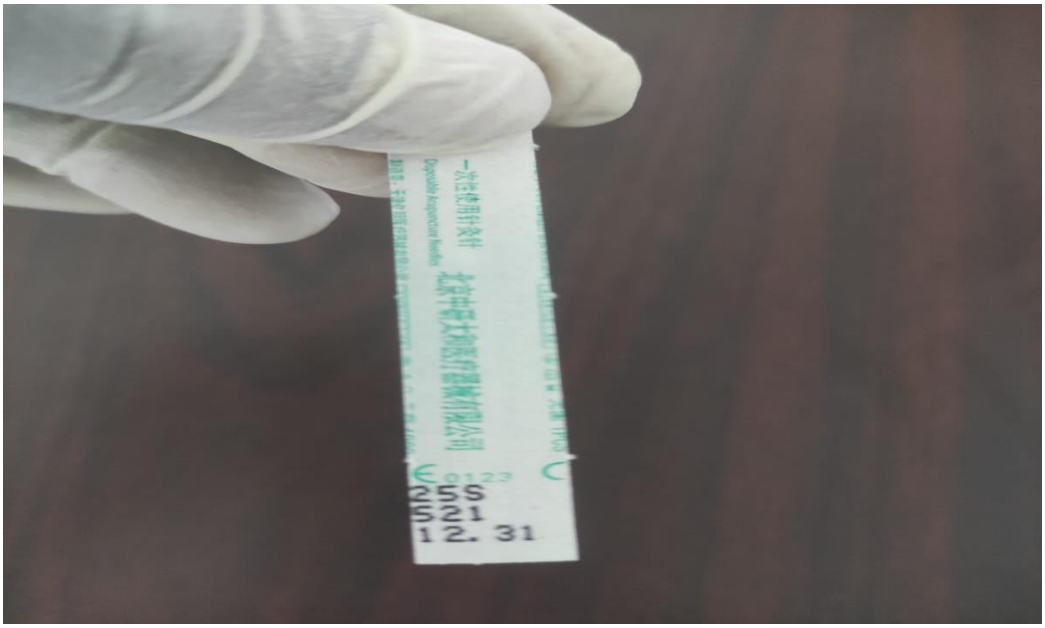
Experimental group treatment protocol:

The intervention was conduct by two physiotherapists. Each treatment session lasted approximately 40 minutes in both groups. There were 3 treatment session per weeks and provide total 18 session of treatment of both groups. Participant discharges are at the discretion of the physical therapist in agreement with the participant. No specific criteria were established a priori in order to maintain the pragmatic nature of the trial. Participants in the experimental group received the dry needling technique on the neck at the end of each session. The physiotherapist determined which muscle to treat after assessing for the presence of nodules that are hyperirritable and hyperalgesic to palpation in those muscles. Sterile stainless steel acupuncture needles (0.25 x 0.4 mm; made in china) are used. The needle is introduced subcutaneously, penetrating the skin 10 to 15 mm of depth, and manipulated in order to obtain local contraction response to be elicited. After the first local twitch response is identified, vertical without rotational needle movement of the needle is performed to obtain up to two additional twitch responses. The experimental group participants also received manual and electrotherapy in each session.

Clinical dry needling along with other intervention was given by trained qualified physiotherapist in the experimental group.

Table-1: Intervention Protocol
Experimental Group (40 minutes)
1) Dry needling (10 minutes) 2) Manual therapy (15 minutes) 3) Electrotherapy (15 minutes)




一次性使用针灸针
Disposable Acupuncture Needles
0.25
25
51
1
25
52
1
31

Conventional group treatments protocol:

Participants in both groups received a rehabilitation protocol comprised of manual and electrotherapy therapy for a period of six weeks. The Physiotherapist could use manual treatment include neck and thoracic mobilization, strengthening exercise for neck and upper back muscles against manual resistance. The pivotal aims of the interventions were to reduce neck pain, strengthen neck and upper back muscles, increase range of motion, and educate the patients about neck self-neck care in daily activities.

3.12 Data analysis: statistical package for the social science (SPSS) version 24.0 and Microsoft excel 2016 were used to analyze the data. Every survey was double-checked for clarity and accuracy. Types, values, decimals, label alignment, and measurement level information must first be entered into SPSS's variable view. The next move was to load SPSS's data view. After entering all data, the researcher double-checked to make sure that the information on the questionnaire sheet had been correctly transferred to the SPSS data view. After that, we could use SPSS to analyze the raw data.

Based on the data the researcher was utilized two statistical tests. For between analyses researcher had done Mann- Whitney U test, and for within group analysis researcher used Wilcoxon signed-rank test.

1.13 Statistical test:

The Mann Whitney U test

The Mann Whitney U test is one of the non- parametric tests. This method is employed to compare the means of two samples originating from the same population. Its purpose is to determine whether the two sample means are equal or not. The Mann-Whitney U test is typically employed when the data does not meet the assumptions of the t-test. In this study, the researcher utilized this test to analyze the average value of neck pain between two groups.

The Wilcoxon signed-rank test

The Wilcoxon signed-rank test is a non-parametric statistical test that is employed to compare two related samples. This study utilized the numeric pain rating scale (NPRS) and the Oswestry Neck disability Index questionnaire (NDI) to examine pain and disability within a specific population.

The Independent Sample t Test

The independent sample t-test is a parametric test that compares the means of two independent groups. Its purpose is to assess if there is statistical evidence that the population means associated with these groups are significantly different. This study included a test to assess the differences between two groups experiencing neck pain.

Paired Sample t Test

The Paired-Samples T Test technique compares the means of two variables within a single group. The procedure calculates the disparities between the values of the two variables. In this study, the researcher employed this method to examine neck pain and disability among two groups: the experimental interventional group and the conventional intervention groups.

3.14 Level of Significance:

The significance level was established at 95% ($p<0.05$). The "p" value is referred to as the level of significance in an experiment, and a "p" value of less than 0.05 is considered a significant outcome in health service research. If the p-value is less than or equal to the significance level, the results are considered statistically significant (DePoy and Gitlin, 2015).

The researchers computed the "p" value. The p-value represents the likelihood of observing the results obtained in an experimental investigation. The concept of "probability" pertains to the degree of certainty or precision of the obtained findings. In experimental settings, the "p value" precisely denotes the level of significance, typically with a threshold of 0.05 in health service research. A p value of 0.05 or lower is commonly understood to indicate a statistically significant result. Results are considered statistically significant when the estimated p value meets or falls below a preset level of significance, indicating that the observed effects are unlikely to have occurred by chance alone.

3.15 Ethical consideration:

The study followed the guidelines provided by the Bangladesh Medical and Research Council (BMRC) and the World Health Organization (WHO) in all its procedures. The Institutional Review Board (IRB) and the ethical review committee of the Bangladesh Health Professions Institute (BHPI) both granted their official endorsement to the proposed approach of the dissertation. Participants were permitted to seek therapy for other purposes as per standard practice in order to avoid any ethical objections. Prior to data collection, all participants received a detailed explanation of the underlying purpose and objectives of the study. To safeguard the confidentiality of the participants, all study-related materials were deliberately destroyed when the research endeavor was completed. Prior to the commencement of the experiment, every participant duly completed an informed consent form, so expressing their agreement to partake in the study. Every individual who participated in the study provided their explicit agreement to the researcher. All test subjects willingly ceased the consumption of the recommended medication administered by the responsible physiotherapist for the duration of the trial. It is widely understood that individuals have the authority to make the ultimate decision if they so want. Participants were informed of their right to withdraw from the study at any time

without consequences and their right to decline answering any questions. If a patient chooses to discontinue their participation in the study, they will still get specialized care in the Physiotherapy Department that is specifically designed to meet their unique needs.

3.16 Informed Consent:

Obtaining informed permission is an essential component of the study process. Obtaining informed permission is a necessary obligation from both an ethical and legal standpoint when doing research that involves human participants. Informed consent, as defined by Hardicre (2014), is the act of agreeing to participate in a study after being provided with all necessary and clearly understandable information regarding the implications of participation, specifically with regards to potential risks and benefits.The fundamental ethical concept concerning informed consent in research is the conviction that every individual should be treated with dignity and regard (O'neill, 2017). Researchers must demonstrate a high regard for diversity while obtaining informed consent, including aspects such as race, gender, religious views, culture, language, and degree of comprehension. The ethical governance and conduct of human research is heavily dependent on the essential role of informed consent (Killawi et al., 2014). Informed consent is the procedure by which a participant is provided with comprehensive information regarding all aspects of the experiment. Prior to commencing data collection, the researcher adhered to the consent form. Obtaining agreement from the subjects is crucial (Bell & Waters, 2018). The researcher clarified that the participants were entirely voluntary and possessed the complete right to withdraw from the study at any point. Additionally, the researcher ensured the maintenance of confidentiality. When conducting research that involves children who are under the age of 18, it is necessary to acquire agreement or authorization from their parents (Morrow, Argent & Kling, 2015). Informed permission is an essential element of the research process, as it is both an ethical obligation and a legal need in studies that involve human participants. Informed consent, as defined by Hardicre (2014), is the process in which individuals give their agreement to participate in a study after receiving thorough and easily comprehensible information about the nature of their involvement, particularly regarding potential risks and benefits. The ethical principle that forms the foundation of informed consent in research is based on the belief that all individuals should be

treated with dignity and respect (O'Neill, 2017). Researchers have a responsibility to ensure diversity and inclusivity when getting informed consent. This includes considering aspects like as race, gender, religious views, cultural background, language ability, and degree of comprehension (Killawi et al., 2014). In human research, informed consent plays a crucial role in assuring ethical monitoring and proper conduct (Killawi et al., 2014). Prior to commencing data collection, the researcher meticulously adhered to a comprehensive consent procedure. Obtaining explicit agreement from participants is crucial, as highlighted by Bell and Waters (2018). It is important to emphasize that participation is completely voluntary and that participants have the total prerogative to withdraw from the study at any point. Moreover, the study ensured the confidentiality of participants' personal information at all times. When conducting research that involves individuals who are under the age of 18, it is necessary to take extra measures to get consent or approval from their parents or legal guardians (Morrow, Argent, & Kling, 2015). This guarantees the maintenance of ethical principles and the safeguarding of the rights and well-being of vulnerable groups, such as children, throughout the entirety of the research procedure. Before conducting the examination and interviews with the responders, it was crucial to obtain agreement from the subjects. For this inquiry, the assessor obtained informed consent from each participant and verbally disclosed the information to the individual.

CHAPTER-IV RESULTS

A total of 40 participants were used in this study to examine effectiveness of dry needling in patients with chronic neck pain. The following paragraphs provide a summary of the investigations findings.

Baseline characteristics

This table displays the socio-demographic characteristics of two groups: the experimental and control groups. The variables included in the table are age group, gender, residing area, educational attainment, monthly income group, marital status, and family type. The data are presented as the number and percentage of people in each category for each variable. The experimental group consisted of 11 individuals (55% of the total) between the ages of 20 and 40, 9 individuals (45%) between the ages of 40 and 60, and 0 individuals (0%) over the age of 60 above. The control group had 13 individuals in the 20-40 years age range (65%), 5 individuals in the 40-60 years age range (30%), and 1 in the 60+ year's age range (5%). In terms of gender, the experimental group consisted of 10 males (50%) and 10 female (50%), whereas the control group consisted of 13 males (65.0%) and 7 females (35%).

17 members of the experimental lived in rural areas (85.0%), 3 members lived in semi-urban areas (15%). The control group consisted of 19 individuals in rural areas (95%), 0 individuals in semi-urban areas (0%), and 1 individual in urban areas (5%). Three Individuals (15%) in the experimental group had govt. service, no individual had private service , 2 individuals (10%) had business, 7 individuals (35%) had housewife, 1 individuals (5.0%) had day labor, 1 individual (5%) had unemployed and 6 individual (30%) had others like student or emigrant. 1 Individuals (5%) in the control group had govt. service, 2 individual had private service(10%) , 9 individuals (45%) had business, 7 individuals (35%) had housewife, 1 individuals (5.0%) had day labor. Individuals (15%) in the experimental group were illiterate, 3 individuals (15%) had completed primary, 5 individuals (25%) had completed SSC, and 7 individuals (35.0%) had HSC and 2 individual (10) had graduated or attained higher education. no member of the control group (0%) was illiterate, 9 members (45%) had completed primary, 8 members (40%) had completed SSC, 2 members (10%) had

completed HSC and 1 members (5%) had graduated or attained higher education. six individuals (30%) in the experimental group had a monthly income between 10,000 and 20,000 taka, 8 individuals (40%) had a monthly income between 20,000 and 30,000 taka, and 6 individual (30%) had a monthly income of 30,000 taka or more. 6 members of the control group (30%) were in the 10000-20000 taka category, 13 members (65%) were in the 20000-30000 taka category, and 1 members (5%) were in the 30000+ taka category.

Both categories had a similar distribution of marital status, with the majority being married. The experimental group consisted of 17 individuals who were married (85.0%), 3 individual who were unmarried (15%). The control group consisted of 20 individuals who were married (100%), 0 individuals who were unmarried (0%). In terms of family structure, the experimental group comprised 18 member of a nuclear family (80%) and 2 members of a joint family (20%). The control group consisted of 15 nuclear families 75% of the total) and 5 joint families 25% of the total (Table no 4.1).

Table 4.1: Socio-demographic information of experimental and control group

Variable		Frequency/Percent (Experimental)	Frequency/Percent (Control)	Total
Age	20-40	11/ 55%	13/ 65%	24/ 60%
	40-60	9/ 45%	6/ 30%	15/ 37.5%
	60+	0/ 0%	1/ 5%	1/ 2.5%
Gender	Male	10/ 50%	13/ 65%	23/ 57.5%
	Female	10/ 50%	7/ 35%	17/ 42.5%
Marital status	Unmarried	3/ 15%	0/ 0%	3/ 7.5%
	Married	17/ 85%	20/ 100%	37/ 92.5%
Occupation	Govt. Service	3/15%	1/ 5%	4/ 10%
	Private. Service	0/0%	2/ 10%	2/ 5%
	Business	2/10%	9/ 45%	11/ 27.5%
	Housewife	7/ 35%	7/ 35%	14/ 35%
	Day labor	1/ 5%	1/ 5%	2/ 5%
	Unemployed	1/ 5%	0/ 0%	1/ 2.5%
	Others	6/ 30%	0/ 0%	6/ 15%
Educational qualification	Illiterate	3/ 15%	0/ 0%	3/ 7.5%
	Primary	3/ 15%	9/ 45%	12/ 30%
	SSC	5/ 25%	8/ 40%	13/ 32.5%
	HSC	7/ 35%	2/ 10%	9/ 22.5%
	Graduate	2/ 10%	1/ 5%	3/ 7.5%
Living area	Rural	17/ 85%	19/ 95%	36/ 90%
	Semi-rural	3/ 15%	0/ 0%	3/ 7.5%
	Urban	0/ 0%	1/ 5%	1/ 2.5%

Monthly Income(Taka)	10000-20000	6/ 30%	6/ 30%	12/ 30%
	20000-30000	8/ 40%	13/ 65%	21/ 52.5%
	30000+	6/ 30%	1/ 5%	7/ 17.5%
Family type	Nuclear family	18/ 90%	15/ 75%	33/ 82.5%
	Joint family	2/ 10%	5/ 25%	7/ 17.5%

The table displays the NPRS assessment was used to evaluate the chronic neck pain of participants in experimental group, pre-test mean score was 2.55 (SD=0.51), 1-3 mild pain participants were o, 4-6 moderate pain participants were 9, 7-10 severe pain participants were 11. Post-test mean score was 1.15 (SD=0.36), 1-3 mild pain participants were 17 participant; 4-6 moderate pain participants were 3. There was no severe pain participant.

The table displays the oswestry neck disability index questionnaire (NDI) assessment was used to evaluate the disability of participants in experimental group, pre-test mean score was 2.75 (SD=0.78), 0-20 minimal disability was o, 20-40 moderate disability was 10, 40-60 severe disability was 1 participant, 60-80 crippled was only 1 participant, 80-100 bed bound participant was 1 only. The post-test mean score was 1.10 (SD=0.30), 0-20 minimal disability was 18 participants, 20-40 moderate disability was only 2 participants, 40-60 severe disability was no participant, 60-80 crippled was no participant, 80-100 bed bound there was no participant (Table no 4.2).

Table 4.2: Baseline analysis of numeric pain rating scale and oswestry neck pain disability index questionnaire of experimental group.

Variable		**Experimental Group**			
		Pre-test		**Post-test**	
		Frequency	Mean±SD	Frequency	Mean±SD
NPRS	(1-3)Mild pain	0	2.55±0.51	17	1.15±0.36
	(4-6) Moderate pain	9		3	
	(7-10) severe pain	11		0	
Oswestry neck pain disability index questionnaire (NDI)	(0-20) minimal disability	0	2.75±0.78	18	1.10±0.30
	(20-40) Moderate disability	8		2	
	(40-60) Severe disability	10		0	
	(60-80) cribbed	1		0	
	(80-100) bed-bound	1		0	

The table displays the NPRS assessment was used to evaluate the chronic neck pain of participants in control group, pre-test mean score was 2.40 (SD=0.50), 1-3 mild pain participants were o, 4-6 moderate pain participants were 12, 7-10 severe pain participants were 8. Post-test mean score was 1.20 (SD=0.41), 1-3 mild pain participants were 16 participant; 4-6 moderate pain participants were 4. There was no participant of severe pain.

The table displays the oswestry neck disability index questionnaire (NDI) assessment was used to evaluate the disability of participants in experimental group, pre-test mean score was 2.55 (SD=0.55), 0-20 minimal disability was 1, 20-40 moderate disability was 13, 40-60 severe disability was 6 participants, 60-80 crippled was 0 participant, there was no bed bound, Participant. The post-test mean score was 1.05 (SD=0.22), 0-20 minimal disability was 19 participants, 20-40 moderate disability was only 1 participant, 40-60 severe disability was no participant, 60-80 crippled was no participant, there was no bed bound Participant, 80-100 bed bound (Table no 4.3).

Table 4.3: Baseline analysis of Numeric pain rating scale and oswestry neck pain disability index questionnaire of Control group.

Variable		**Control Group**			
		Pre-test		**Post-test**	
		Frequency	Mean±SD	Frequency	Mean±SD
NPRS	(1-3) Mild pain	0	2.40±0.50	16	1.20±0.41
	(4-6) Moderate pain	12		4	
	(7-10) severe pain	8		0	
Oswestry neck pain disability index questionnaire (NDI)	(0-20) minimal disability	1	2.25±0.55	19	1.05±0.22
	(20-40) Moderate disability	13		1	
	(40-60)Severe disability	6		0	
	(60-80) crippled	0		0	
	(80-100) bed-bound	0		0	

Table displays the computed value of U. The Z value for neck pain as assessed by the experimental group was - 2.87, the control group was -2.66. The mean rank for the control group was 9.00, while for the experimental group it was 8.71; the table indicates that the probability value for accepting the null hypothesis was 0.001. Therefore, the outcome rejects the null hypothesis and suggests a highly significant difference (Table no 4.4).

Table 4.4: Between group analysis of neck pain measured by numeric pain rating scale (NPRS)

The Mann-Whitney U test has been done to find out the difference control and experimental group.

Rank and test statistics of chronic neck pain

Between group analysis				
Category of patient	**Test Statistics (Mann-Whitney U Score)**			
	df	**Mean rank**	**Z value**	**P value**
Control	18	9.00	-2.66	0.008**
experimental	18	8.71	-2.87	0.001***

Table displays the computed value of U. The Z value for neck disability as assessed by the experimental group was -1.74; the control group was -1.45. The mean rank for the control group was 10.13, while for the experimental group it was 9.81; the table indicates that the probability value for accepting the null hypothesis was 0.08. Therefore, the outcome rejects the null hypothesis and suggests a significant difference (Table no 4.5).

Table 4.5: Between group analyses of neck disability measured by oswestry neck disability index questionnaire

The Mann-Whitney U test has been done to find out the difference between control and experimental group.

Rank and test statistics of disability

Between group analysis				
Category of patient	**Test Statistics (Mann-Whitney U Score)**			
	df	**Mean rank**	**Z value**	**P value**
Control	18	10.13	-1.45	0.14
experimental	18	9.81	-1.74	0.08

The table displays a comparison of neck pain scores of participants in the control group prior to (pre) and subsequent to (post) the investigation. According to the table's legend, there was noticeable change in neck pain among the participants in the control group. Following the administration of traditional treatment, a total of 20 patients had a notable decrease in neck pain. In addition, no participants in the control group reported a similar amount of pain both before and after the treatment. The computed probability value shows a statistically significant difference. Table displays a comparison of neck pain scores of participants in the experimental group prior to (pre) and subsequent to (post) the investigation. According to the table's legend, there was noticeable change in neck pain among the participants in the experimental group. Following the administration of traditional treatment, a total of 20 patients had a notable decrease in neck pain. In addition, no participants in the experimental group reported a similar amount of pain both before and after the treatment. The computed probability value shows a statistically significant difference (Table no 4.6).

Table 4.6: Within group analysis of neck pain Measured by numeric pain rating scale (NPRS)

Within group analysis has been done by Wilcoxon Signed Rank test

Test Statistics (Wilcoxon Signed Rank Test)

Numeric pain rating scale NPRS)	**N**	**Pre-test and post-test**	
		Z value	**P value**
Control group	20	-4.17	0.000***
Experimental group	20	-4.05	0.000***

*, Significance value

The table displays a comparison of disability scores of participants in the control group prior to (pre) and subsequent to (post) the investigation. According to the table's legend, there was noticeable change in disability among the participants in the control group. Following the administration of traditional treatment, a total of 20 patients had a notable decrease in neck disability. In addition, no participants in the control group reported a similar amount of disability both before and after the treatment. The computed probability value shows a statistically significant difference. The table shows a comparison of neck disability scores of participants in the experimental group prior to (pre) and subsequent to (post) the investigation. According to the table's legend, there was noticeable change in disability among the participants in the experimental group. Following the administration of traditional treatment, a total of 20 patients had a notable decrease in neck disability. In addition, no participants in the experimental group reported a similar amount of disability both before and after the treatment. The computed probability value shows a statistically significant difference (Table no 4.7)

Table 4.7: Within group analysis of disability Measured by Oswestry neck pain disability index questionnaire (NDI)

Within group analysis has been done by Wilcoxon Signed Rank test

Test Statistics (Wilcoxon Signed Rank Test)

Oswestry neck pain disability index questionnaire (NDI)	**N**	**Pre-test and post-test**	
		Z value	**P value**
Control group	20	-4.02	0.000***
Experimental group	20	-4.00	0.000***

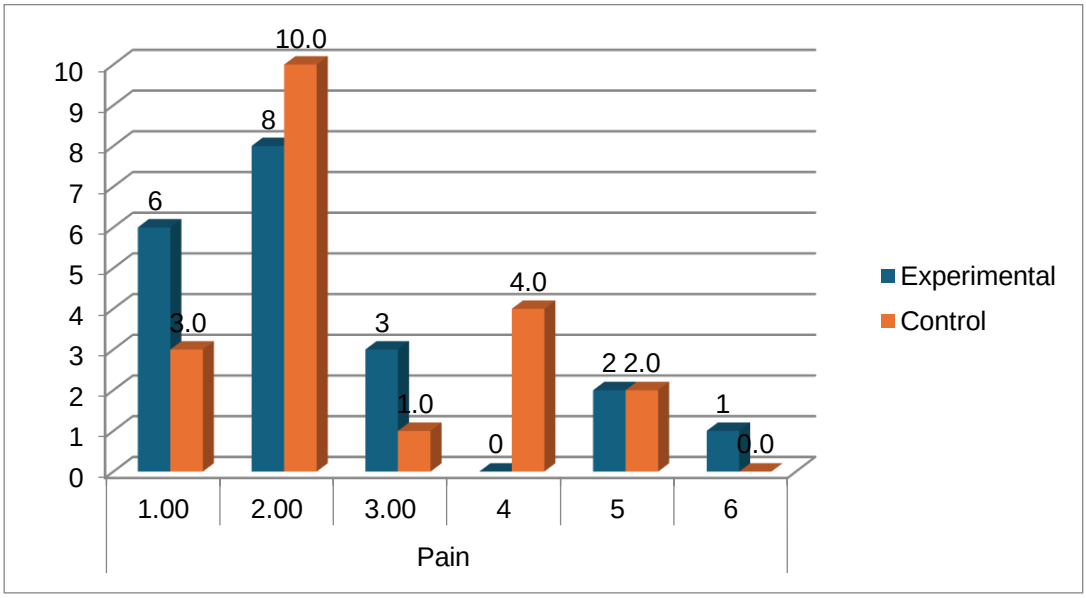
*, Significance value

The table shows the results of paired t-tests on oswestry neck pain disability index questionnaire data from the Experimental and Control groups. The first column lists the oswestry neck pain disability index questionnaire variables: NPRS, Pain intensity, personal care, lifting, reading, headache, concentration, work, travelling, sleeping, recreation, disability. The second and third columns show the Experimental group's t-value and p-value for each variable, whereas the fourth and fifth columns show the Control group's values. The oswestry neck pain disability index questionnaire showed significant improvements in all parameters of neck pain in the Experimental group after the intervention. The Control group also improved all variables with p-values from 0.000 to 0.00. The Control group improved less than the Experimental group. For example, the Control group had lower t-values for Pain intensity and Recreation than the Experimental group, indicating that the intervention was more effective in lowering pain and improving recreation. The table shows that the intervention improves neck pain across various dimensions and underlines the potential benefits of such therapies neck pain patients (Table no 4.8).

Table 4.8: Paired t test of oswestry neck pain disability index questionnaire within group of experimental and control group's variable

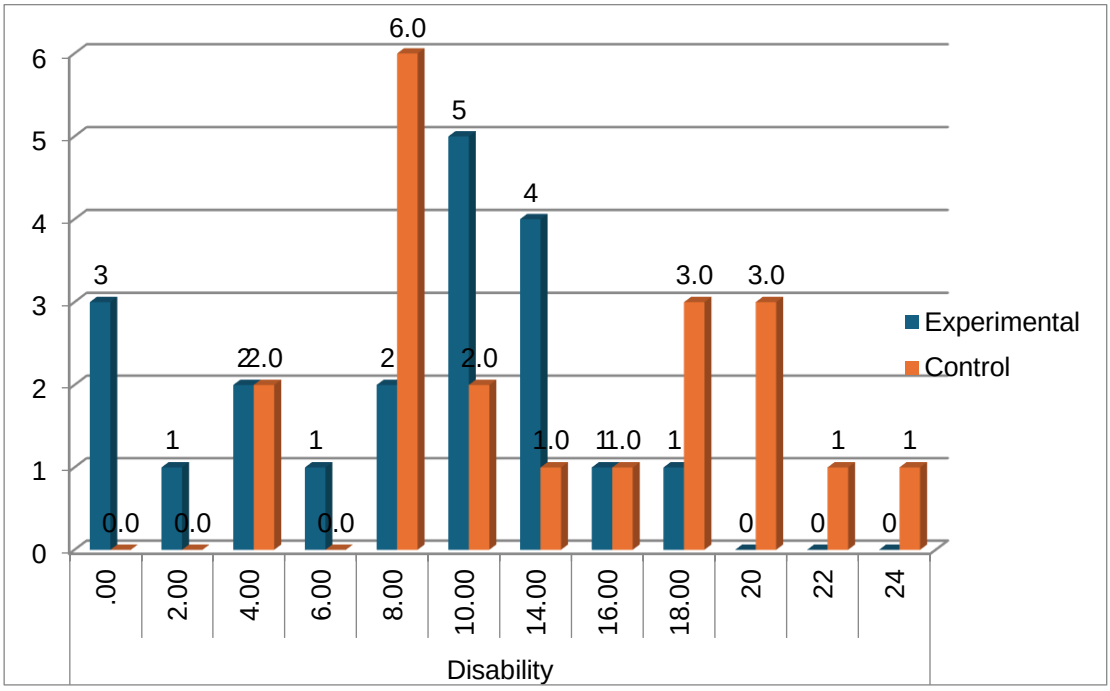
Variable	Experimental		Control	
	t	P value	t	P value
Pain intensity	21.88	.000***	10.48	.000***
Personal care	19.43	.000***	5.08	.000***
Lifting	11.41	.000***	3.70	.001**
Reading	14.33	.000***	7.85	.000***
Headache	5.59	.000***	4.87	.000***
Concentration	12.07	.000***	10.25	.000***
Work	13.81	.000***	5.64	.000***
Travelling	14.22	.000***	4.29	.000***
Sleeping	7.25	.000***	7.02	.000***
Recreation	9.31	.000***	8.75	.000***

Figure 4.1: The difference between experimental and control group of pain



In the table, there are two sets of values for 2 different cases, which are labeled Colum through row. The first group is called control, and the second group is called experimental. Based on the values listed, it looks like control and experimental are two different measures or variables that are being tracked across all 2 cases. In case Colum, for example, the control value is 3 and the experimental value is 6.

Figure 4.2: The difference between experimental and control group of disability



In the table, there are two sets of values for two different cases, which are labeled Colum through row. The first group is called control, and the second group is called experimental. Based on the values listed, it looks like control and experimental are two different measures or variables that are being tracked across all 2 cases. In case Colum, for example, the control value is 0 and the experimental value is 3.

CHAPTER-V DISCUSSION

The aim of this study was to evaluate the differences between the experimental group's pre and post treatments, while also measuring its effectiveness using a control group. Prior studies have investigated distinctions between manual treatment and therapeutic exercise, but they were deficient in thorough clinical performance protocols, instead focusing on dry needling or traditional physiotherapy (Luch et al., 2014). We argue that our intervention methods can be considered as possible therapy options without requiring any supplementary techniques.

The treatments administered to the experimental group showed significant effectiveness when compared to the control group in people suffering from persistent neck discomfort. Noticeable enhancements and considerable impacts were noted in disability and subjective pain in the short and medium durations. Upon comparing the treatments within the experimental group, it was discovered that the dry needling group demonstrated statistically significant immediate results in lowering disability, as assessed by the Oswestry Neck Disability Index questionnaire. Statistically significant differences were found between the experimental groups in both the short and medium terms, indicating significant changes in their results. This suggests that dry needling leads to a more rapid decrease in cervical disability, but both treatments yielded considerable enhancements in neck pain and disability. The evaluation utilizing the Numeric Pain Rating Scale (NPRS) demonstrated that the treatments administered to the experimental group produced noteworthy outcomes in comparison to the control group.

The results of our study showed that both manual therapy and therapeutic exercise led to significant reductions in disability and reported pain among individuals with neck issues who received short-term treatments. According to recent systematic studies, the effectiveness of these therapies has been categorized as moderate by Fredin and Loras in 2017. Nevertheless, our study did not evaluate the enduring modifications, which is a significant constraint, particularly in those with persistent pain. It is important to note that our study is limited by its small sample size, and a bigger sample would allow for more conclusive findings. In addition, dry needling facilitates active

treatment, perhaps assisting in the reduction of neck pain and addressing the prevalent fear of movement in these patients (Hidalgo et al., 2017).

Research investigating the efficacy of dry needling in patients with persistent neck pain suggests that this treatment can help reduce pain levels, enhance functional capability, and decrease disability. Although the initial results show promise, it is necessary to further enhance the evidence by resolving the stated shortcomings and undertaking additional study. By integrating dry needling into rehabilitation programs for persons suffering from chronic neck pain, healthcare professionals have the opportunity to give an invasive yet successful approach to lowering neck discomfort and disability, while simultaneously improving overall well-being. In a recent study conducted by Smith et al. (2021), the researchers analyzed the results of the study in various age groups. They discovered that the control group had a higher percentage of participants aged 20-40 (65%) compared to the experimental group (55.0%).

Additionally, there were more participants between the ages of 20 and 40 in the test group (55%) than in the control group (65%). Although neither group had any individuals aged 60 or older, the percentage of individuals in the experimental group was larger, at 26.7%. Although these findings may suggest that the treatment is more successful in younger age groups and less effective in older age groups, it is required to consider other features, such as the sample size and other confounding variables, to draw any firm conclusions. Unfortunately, the study did not evaluate the drug's long term effects. In this piece, Lee et al. (2020) looked into the effects of a medicine across multiple age groups and sexes. There were 23 men (57.5% of the sample) and 17 women (42.5% of the sample) in the research. The control group consisted of 13 males (65.0% of the total), while the experimental group consisted of 10 males (50% of the total). The control group consisted of 7 women (35.0%), while experimental group 10 women (50%) took part in the study. Gupta et al. (2021) did a similar study to examine the intervention's effects across a range of socioeconomic and educational statuses. Forty persons were analyzed, and 13 (32.3%) were found to have an SSC.

Five in the control group (25%) and eight in the experimental group (40%) had annual earnings between 10000 and 20000 taka, respectively. Six persons (30% of the group) in the control group and five people (30% of the bracket) in the experimental group had incomes between 20000 and 30000 taka. In their study, Khan et al. (2020) analyzed how income and marital status influenced the outcomes of an intervention.

The study found that 20 participants (100% of the total) in the control group were married, while 17 participants (85% of the total) were married in the experimental group. At the outset, there were no single people in the control group and three single people in the experimental group (15%). The study included 40 participants, 37 (92.5%) of whom were married, 3 (7.5%) of whom had been unmarried. In addition, thirty three (72.5%) of the participants belonged to small families, whereas seven (17.5%) joint family. Of the 19 participants in the control group, 90% came from rural area and 5% lived urban. These findings highlight the potential for effective therapy across socioeconomic class, marital status, and family type, indicating that the intervention may have equivalent advantages across these variables. Another study that looked at the effects of an intervention across age and socioeconomic groups was undertaken by Lee et al. (2021. The study found that while the control group 10000-20000 taka income 30%, the experimental group10000-20000 taka income 30%, and 20000-30000 taka in control group income 65 % and experimental group income was 40% and 30000+ taka was 5% and experimental group was 30%.

The NPRS assessment was used to evaluate the chronic neck pain of participants in experimental group, pre-test mean score was 2.55 (SD=0.51), 1-3 mild pain participants were o, 4-6 moderate pain participants were 9, 7-10 severe pain participants were 11. Post-test mean score was 1.15 (SD=0.36), 1-3 mild pain participants were 17 participant; 4-6 moderate pain participants were 3. There was no severe pain participant.

The oswestry neck disability index questionnaire (NDI) assessment was used to evaluate the disability of participants in experimental group, pre-test mean score was 2.75 (SD=0.78), 0-20 minimal disability was o, 20-40 moderate disability was 10, 40-60 severe disability was 1 participant, 60-80 crippled was only 1 participant, 80-100 bed bound participant was 1 only. The post-test mean score was 1.10 (SD=0.30), 0-20 minimal disability was 18 participants, 20-40 moderate disability was only 2 participant, 40-60 severe disability was no participant, 60-80 crippled was no participant, 80-100 bed bound there was no participant.

The NPRS assessment was used to evaluate the chronic neck pain of participants in control group, pre-test mean score was 2.40 (SD=0.50), 1-3 mild pain participants were o, 4-6 moderate pain participants were 12, 7-10 severe pain participants were 8. Post-test mean score was 1.20 (SD=0.41), 1-3 mild pain participants were 16

participant; 4-6 moderate pain participants were 4. There was no participant of severe pain.

The table displays the oswestry neck disability index questionnaire (NDI) assessment was used to evaluate the disability of participants in experimental group, pre-test mean score was 2.55 (SD=0.55), 0-20 minimal disability was 1, 20-40 moderate disability was 13, 40-60 severe disability was 6 participants, 60-80 crippled was 0 participant, there was no bed bound, Participant. The post-test mean score was 1.05 (SD=0.22), 0-20 minimal disability was 19 participants, 20-40 moderate disability was only 1 participant, 40-60 severe disability was no participant, 60-80 crippled was no participant, there was no bed bound Participant, 80-100 bed bound

The effects of a 40 intervention on patients' NPRS scores and pain levels were also studied by Yoon et al. (2019). Prior to the intervention, the average NPRS score for the pretest experimental group was 2.55 ±0.51 and pretest control group was 2.40±0.40 after intervention the pain level at NPRS scores was decrease at experimental was 1.15±0.36 and control group was 1.20±0.41 .

After the treatment, however, the experimental group's mean pain score decreased as the control groups. After the intervention, the experimental group reported significantly less pain than the control group, with a mean pain score of 1.15 similarly, before the intervention; the experimental group pain scored 2.55 on subscale, whereas the control group scored 2.40. However, after the intervention, the experimental group's mean score of 1.15 was significantly higher than the control group's score of 1.20. After the treatment, however, the experimental group's mean disability score decreased as the control groups. Comparing pre-treatment disability scores between the control and intervention groups. After the intervention, the experimental group reported significantly less disability than the control group, with a mean pain score of 1.10±0.30.

Similarly, before the intervention, the experimental group disability scored 2.75±0.78 on subscale, whereas the control group scored 2.25±0.55. However, after the intervention, the experimental group's mean score of disability 1.10±0.30 was significantly higher than the control group's score of 1.05±0.22.

In a similar, the experimental group had a significantly lower mean score for Pain (1.15) than the control group (1.20). Furthermore, the experimental group had a

significantly higher mean and standard deviation of pain 0.51, compared to the control group's 0.50. Finally, the experimental group had a significantly lower mean score of disability (1.10) than the control group (1.05). These findings demonstrate that the experimental group benefited from the intervention in terms of pain, and disability as compared to the control group. The two groups were compared on measures of pain intensity and disability.

The Z value for neck pain as assessed by the experimental group was - 2.87, the control group was -2.66. The mean rank for the control group was 9.00, while for the experimental group it was 8.71; the table indicates that the probability value for accepting the null hypothesis was 0.001. Therefore, the outcome rejects the null hypothesis and suggests a highly significant difference. The Z value for neck disability as assessed by the experimental group was -1.74; the control group was -1.45. The mean rank for the control group was 10.13, while for the experimental group it was 9.81; the table indicates that the probability value for accepting the null hypothesis was 0.08. Therefore, the outcome rejects the null hypothesis and suggests a significant difference.

Following the administration of traditional treatment, a total of 20 patients had a notable decrease in neck pain. In addition, no participants in the control group reported a similar amount of pain both before and after the treatment. The computed probability value shows a statistically significant difference after receiving conventional therapy, a total of 20 patients experienced a significant reduction in neck pain. Furthermore, none of the subjects in the experimental group reported experiencing an equivalent level of pain prior to and during the treatment. The calculated probability value indicates a statistically significant distinction (p=000). After receiving conventional therapy, a total of 20 patients experienced a significant reduction in neck disability. Furthermore, none of the patients in the experimental group reported an equivalent level of disability both prior to and following the treatment. The calculated probability value indicates a statistically significant distinction (p=000). In this study, we conducted a thorough analysis of three main outcomes, namely neck pain and neck disability, to obtain the test statistics. The results were assessed using the Numeric Pain Rating Scale (NPRS) scores and Oswestry Neck Disability Index questionnaire (NDI) scores, which offered a thorough evaluation of the participants' neck pain and disability. In order to ensure the

reproducibility and validity of our findings, we performed comparisons between the control group and the experimental group, as well as conducted significance tests within each group. It is noteworthy that several researches have been conducted with the explicit aim of improving the condition of people suffering from neck discomfort.

A previous study conducted by Martin et al. in 2017 investigated the importance of specifically addressing the exact site that produces pain. The objective of this study was to optimize the quantity of LTRs, as previous studies have demonstrated a positive correlation between a higher number of LTRs and a more favorable clinical outcome. Our research has demonstrated that in these cases, our patients can experience more advantageous short-term results.

Nevertheless, in contrast to the previously mentioned information, certain studies indicate that doing dry needling without stimulating particular points may be more beneficial than dry needling that does stimulate these locations, especially when the objective of the treatment is to attain long-term outcomes. The results of our study are consistent with a prior inquiry that utilized dry needling on the lumbar multifidus muscles in patients experiencing low back pain. While patients who received LTR showed quick enhancements in function and pain threshold to pressure within one week, the presence of LTR did not lead to a greater overall improvement in pain, disability, function, and pain threshold to pressure after one week (Koppenhaver et al., 2017). Studies suggest that the presence of a local twitch response during dry needling does not necessarily indicate a favorable outcome of the treatment. Our findings differed from a prior study that compared DN to lidocaine infiltration. The results demonstrated that the group displaying local twitch responses saw greater enhancements in mechanical hyperalgesia, pain intensity, and range of motion. Regarding the pain intensity findings, there is a notable decrease in soreness after 1 week and 1 month, namely in the active Myofascial Trigger Point (MTrP) group. Consistent with previous studies, inserting needles into the upper trapezius muscle led to a reduction of about 2 points on the Numeric Pain Rating Scale (NPRS). This study showed a significant influence of time on changes in the upper trapezius. Nevertheless, there was no statistically significant interaction observed between the group and time. In contrast, the group of patients who underwent DDN at active trigger points experienced a lesser increase in PPT in the tibialis muscle compared to

those who received DDN at latent trigger points or outside of trigger points. This finding was reported by (Ziaeifer, Arab & Nourbakhsh, 2016). This study is linked to previous research that showed a correlation between the application of deep dry needling on an active myofascial trigger point and a rise in levels of pressure pain threshold. Moreover, it indicates that this increase could potentially be much more significant after a two-day intervention. Cerezo Tellez et al. saw a notable and substantial improvement of 4 points in PPT, which persisted consistently for a period of 6 months. The researchers conducted three sessions of dry needling on patients experiencing chronic neck pain. Our study incorporates a total of 18 sessions of dry needling and shows significant improvement in all parameters.

CHAPTER-VI LIMITATIONS

The results may not be generalizable if only a small number of people participated in the study. The results would have been more reliable and representative with a bigger sample size.

Short-Term Focus, The study may have overlooked long-term effects in favor of immediate findings. Because cervical spondylosis is a progressive disorder, it is important to evaluate the long-term impact of dry needling.

Even though participants were randomly assigned to treatment groups, there is still a chance that there was some sort of bias in how those groups were assigned or how their performance was evaluated. Reducing potential sources of error in the research is crucial for producing credible results.

Possible Inadequacy of the Study's Control Groups Due to a Lack of Standardization Having a well-matched control group that receives a placebo or alternative intervention is crucial for determining the efficacy of dry needling.

Depending on the study's inclusion criteria and participant characteristics, its findings may not be generalizable to a larger group. As a result, the findings may not apply to a broader population or to people with varying degrees of illness

CHAPTER- VII CONCLUSION & RECOMMENDATION

The intervention of dry needling in the experimental groups resulted in both statistically significant and clinically important changes compared to the control group. Statistically significant differences exist between the experimental groups in the near term. The dry needling group effectively alleviates neck discomfort and lowers impairment. The application of dry needling in physiotherapy led to a substantial decrease in persistent neck pain and impairment. The aim of this study was to examine the relative efficacy of trigger point dry needling in conjunction with physiotherapy compared to traditional physical therapy in the treatment of chronic neck pain in individuals. The execution of this study was accomplished with success, and it possesses the capability to make a substantial contribution to the domain of pain management and rehabilitation. The results could offer vital insights into the most effective method for enhancing the quality of life for persons experiencing chronic neck discomfort. Furthermore, the findings can assist healthcare professionals and policymakers in making informed choices about the most effective treatment approaches for this common and incapacitating disorder. Furthermore, this study is expected to not only satisfy the research objectives, but also expand our comprehension of the mechanisms that contribute to persistent neck pain and the role of trigger point dry needling in its treatment. In general, researchers eagerly anticipate the chance to carry out this research and disseminate our discoveries to the wider scientific community, healthcare professionals, and the general public, with the expectation that it will result in enhanced treatment choices and results for individuals suffering from chronic neck pain.

Recommendation:

The following suggestions are offered for specific authorities and personnel: Dry needling practice should be included in the treatment plan for patients suffering from chronic neck pain.

These dry needling techniques offer a more pragmatic and comprehensive approach to managing neck pain. We recommend that future research should prioritize conducting studies with a substantial number of participants and extended periods of follow-up in order to ascertain the impacts and potential outcomes of dry needling.

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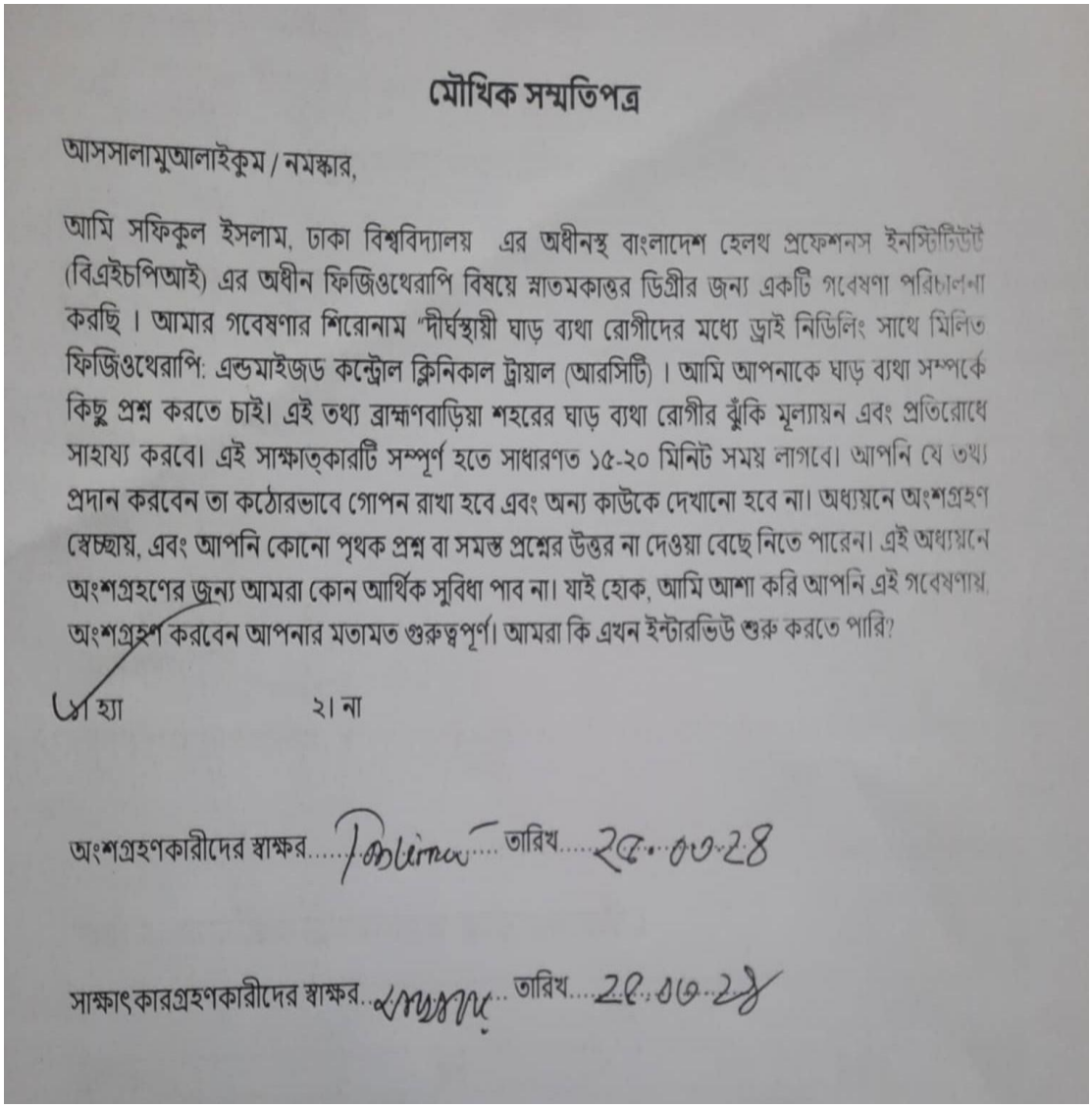
APPENDIXES



মৌখিক সম্মতিপত্র

আসসালামুআলাইকুম / নমস্কার,

আমি সফিকুল ইসলাম, ঢাকা বিশ্ববিদ্যালয় এর অধীনস্থ বাংলাদেশ হেলথ প্রফেশনস ইনস্টিটিউট (বিএইচপিআই) এর অধীন ফিজিওথেরাপি বিষয়ে স্নাতমকাত্তর ডিগ্রীর জন্য একটি গবেষণা পরিচালনা করছি । আমার গবেষণার শিরোনাম "দীর্ঘস্থায়ী ঘাড় ব্যথা রোগীদের মধ্যে ড্রাই নিডিলিং সাথে মিলিত ফিজিওথেরাপি: এন্ডমাইজড কন্ট্রোল ক্লিনিকাল ট্রায়াল (আরসিটি) । আমি আপনাকে ঘাড় ব্যথা সম্পর্কে কিছু প্রশ্ন করতে চাই। এই তথ্য ব্রাহ্মণবাড়িয়া শহরের ঘাড় ব্যথা রোগীর ঝুঁকি মূল্যায়ন এবং প্রতিরোধে সাহায্য করবে। এই সাক্ষাত্কারটি সম্পূর্ণ হতে সাধারণত ১৫-২০ মিনিট সময় লাগবে। আপনি যে তথ্য প্রদান করবেন তা কঠোরভাবে গোপন রাখা হবে এবং অন্য কাউকে দেখানো হবে না। অধ্যয়নে অংশগ্রহণ স্বেচ্ছায়, এবং আপনি কোনো পৃথক প্রশ্ন বা সমস্ত প্রশ্নের উত্তর না দেওয়া বেছে নিতে পারেন। এই অধ্যয়নে অংশগ্রহণের জন্য আমরা কোন আর্থিক সুবিধা পাব না। যাই হোক, আমি আশা করি আপনি এই গবেষণায় অংশগ্রহণ করবেন আপনার মতামত গুরুত্বপূর্ণ। আমরা কি এখন ইন্টারভিউ শুরু করতে পারি?

১। হ্যা ২। না

অংশগ্রহণকারীদের স্বাক্ষর..... তারিখ.....20.03.28

সাক্ষাৎকারগ্রহণকারীদের স্বাক্ষর..... তারিখ.....20.03.28

Permission Latter

Date: 10.12.2023

Head

Department of Physiotherapy

Dr Amjad Hossain Specialized Physiotherapy and Rehabilitation Centre

Ayesh Amjad Tower, Nabinagar, Brahmanbaria.

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

Sir,

With due to respect and humble submission to state that I am Sofiqul islam, a student of part-II M.Sc. in physiotherapy at Bangladesh Health Professions Institute (BHPI). The Ethical committee has approved my research project entitled: **"Physiotherapy combined with dry needling among patients with chronic neck pain: A randomized clinical trial (RCT)"** under the supervision of professor Md. Obaidul Haque, Department of Physiotherapy, 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 Physiotherapy Department at Enam medical college and hospital-Savar, Dhaka-1343. I would like to assure that anything of the study will not be harmful for the participants and the Department itself.

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

Yours faithfully,

Sofiqul Islam

Part-II, M.Sc. in Physiotherapy

Class Roll: 08; Session: 2021-2022

Bangladesh Health Professions Institute (BHPI)

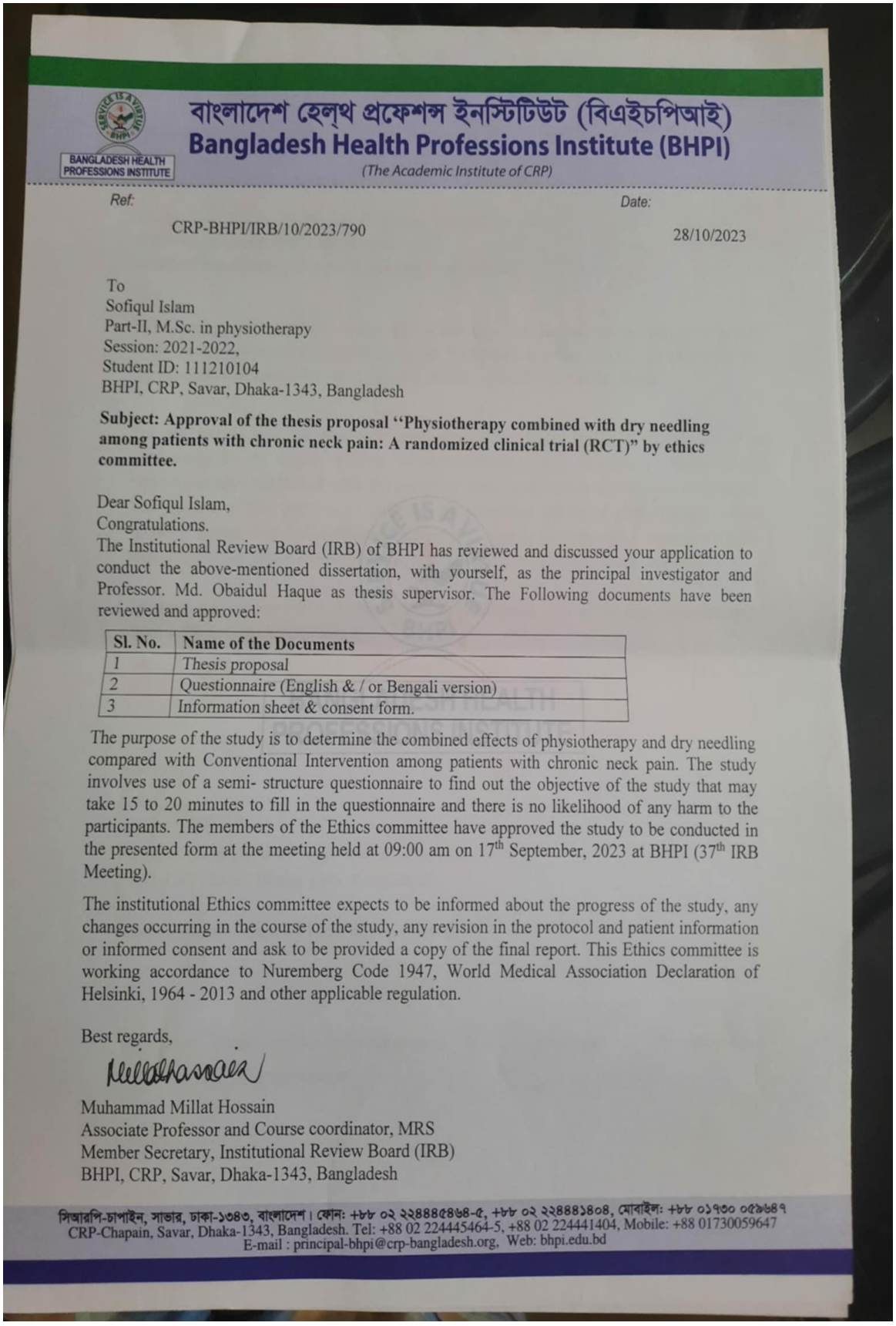
(An academic Institution of CRP)

CRP-Chapain, Savar, Dhaka-1343.

Permission given

Abul Khaeir

12.12.2023



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

Ref: CRP-BHPI/IRB/10/2023/790

Date: 28/10/2023

To
Sofiqul Islam
Part-II, M.Sc. in physiotherapy
Session: 2021-2022,
Student ID: 111210104
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of the thesis proposal "Physiotherapy combined with dry needling among patients with chronic neck pain: A randomized clinical trial (RCT)" by ethics committee.

Dear Sofiqul Islam,
Congratulations.
The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above-mentioned dissertation, with yourself, as the principal investigator and Professor. Md. Obaidul Haque as thesis supervisor. The Following documents have been reviewed and approved:

Sl. No.	Name of the Documents
1	Thesis proposal
2	Questionnaire (English & / or Bengali version)
3	Information sheet & consent form.

The purpose of the study is to determine the combined effects of physiotherapy and dry needling compared with Conventional Intervention among patients with chronic neck pain. The study involves use of a semi- structure questionnaire to find out the objective of the study that may take 15 to 20 minutes to fill in 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 form at the meeting held at 09:00 am on 17th September, 2023 at BHPI (37th 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
Associate Professor and Course coordinator, MRS
Member Secretary, Institutional Review Board (IRB)
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

সিআরপি-চাপাইন, সাভার, ঢাকা-১৩৪৩, বাংলাদেশ। ফোন: +৮৮ ০২ ২২৪৪৪৫৪৬৪-৫, +৮৮ ০২ ২২৪৪৪১৪০৪, মোবাইল: +৮৮ ০১৭৩০ ০৫৯৬৪৭
CRP-Chapain, Savar, Dhaka-1343, Bangladesh. Tel: +88 02 224445464-5, +88 02 224441404, Mobile: +88 01730059647
E-mail : principal-bhpi@crp-bangladesh.org, Web: bhpi.edu.bd

Informed consent

Assalamualaikum, My name **is Sofiqul Islam**; I am a student of part-II M.Sc. in Physiotherapy from Bangladesh health professions institute (BHPI). I am now conducting a research on "**Physiotherapy combined with dry needling among patients with chronic neck pain: A randomized control clinical trial (RCT**)". I would very much appreciate your participation in this study. I would like to ask you some questions about neck pain. This information will help neck pain patient risk assessment and Prevention in the brahmanbaria city. This interview usually takes between 15-20 minutes to complete. Whatever information you provide will be kept strictly confidential and will not be shown to another person. Participation of the study is voluntary, and you can choose not to answer any individual question or all of the questions. However, we hope that you will participate in this study science your views are important. At this time, do you want to ask me anything about the study?

May we begin the interview now?

Signature of the interviewer…….. Date……...

Respondent agrees or disagree to be interviewed if ……1. **Agree……2. Disagree**

We understand that all information will be kept strictly confidential, that we can contract study personnel if we have any questions. We further understand that we can withdraw from the study at any time and we will not get any financial benefit for attending this study. We are willing to participate in the study.

Participants signature…… Date……

Data collector's signature

QUESTIONNAIRE

Physiotherapy combined with dry needling among patients with chronic neck pain: A randomized clinical trial (RCT)

Name of interviewer: ……

ID: ……

Date of interview: _ _ /_ _/_ _ _ _ Time of interview: …….

am/pm

Patient Identification

Name of patient: …….

Address:

……

Phone no……. email……

SECTION: A- SOCIO-DEMOGRAPHIC VARIABLES

Sl. No.	**Question**	**Response**
101	Age	☐ years
102	Sex of the participant	1= Male 2= Female
103	Marital status of the participant	1= unmarried 2= married 3= divorce 4= withdrawn 5= Other: …….

104	Educational background of the participant	1= Illiterate 2=Primary Education 3= SSC 4=HSC 5=Graduate level 6=Postgraduate
105	What is your occupation?	1= Govt. service 2= Private service 3= Businessman 4= Housewife 5= Worker 6= Unemployed 7= Others……
106	What is your monthly family income?	☐ BDT
107	What is your family type?	1= Nuclear family 2= Joint family
108	What is your living area?	1= Urban 2= Rural 3= Semi- rural

SECTION: B- OSWESTRY NECK PAIN DISABILITY INDEX QUESTIONNAIRE

Instruction: Please answer each section by circling the **ONE CHOICE** that most applies to you.

SECTION 1 - Pain Intensity

0) I have no pain at the moment.
1) The pain is very mild at the moment.
2) The pain is moderate at the moment.
3) The pain is fairly severe at the moment.
4) The pain is very severe at the moment.
5) The pain is the worst imaginable at the moment

SECTION 2 -Personal Care (Washing, Dressing, etc.)

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

SECTION 3 - Lifting

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

SECTION 4 - Reading

0) I can read as much as I want to with no pain in my neck.
1) I can read as much as I want to with slight pain in my neck.
2) I can read as much as I want to with moderate pain in my neck.
3) I cannot read as much as I want because of moderate pain in my neck.
4) I cannot read as much as I want because of severe pain in my neck.
5) I cannot read at al

SECTION 5 – Headaches

0) I have no headaches at all.
1) I have slight headaches which come infrequently.
2) I have moderate headaches which come infrequently.
3) I have moderate headaches which come frequently.
4) I have severe headaches which come frequently.
5) I have headaches almost all the time

SECTION 6 – Concentration

0) I can concentrate fully when I want to with no difficulty.
1) I can concentrate fully when I want to with slight difficulty.
2) I have a fair degree of difficulty in concentrating when I want to.
3) I have a lot of difficulty in concentrating when I want to.
4) I have a great deal of difficulty in concentrating when I want to.
5) I cannot concentrate at all.

SECTION 7 - Work

0) I can do as much work as I want to.
1) I can only do my usual work, but no more.
2) I can do most of my usual work, but no more.
3) I cannot do my usual work.
4) I can hardly do any work at all.
5) I cannot do any work at all

SECTION 8 - Traveling

0) I can travel without any neck pain.
1) I can travel as long as I want with slight pain in my neck.
2) I can travel as long as I want with moderate pain in my neck.
3) I cannot travel as long as I want because of moderate pain in my neck.
4) I can hardly travel at all because of severe pain in my neck.
5) I cannot travel my car at all.

SECTION 9 - Sleeping

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

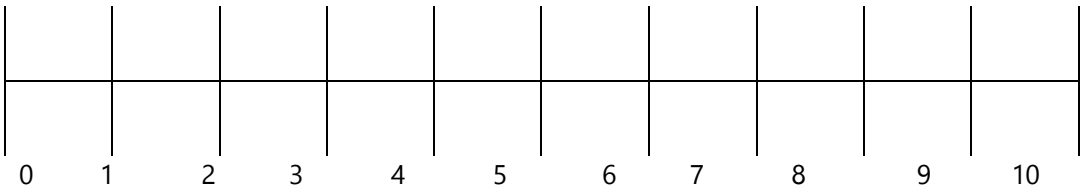
SECTION 10 - Recreation

0) I am able to engage in all of my recreational activities with no neck pain at all.
1) I am able to engage in all of my recreational activities with some pain in my neck.
2) I am able to engage in most, but not all of my recreational activities because of pain in my neck.
3) I am able to engage in a few of my recreational activities because of pain in my neck.
4) I can hardly do any recreational activities because of pain in my neck.
5) I cannot do any recreational activities at all

Total Score= ×100=----------%

SECTION: C- NEUMERIC PAIN RATING SCALE

On the scale, how would you rate your level of pain during the last 24 hours?



প্রশ্নাবলী

শিরোনাম "দীর্ঘস্থায়ী ঘাড় ব্যথা রোগীদের মধ্যে ড্রাই নিডিলিং সাথে মিলিত ফিজিওথেরাপি:

এন্ডমাইজড ক্লিনিকাল ট্রায়াল (আরসিটি)

পর্বঃ ১-রোগীর ব্যক্তিগত পরিচয়ঃ	**আইডিঃ**

রোগীর নামঃ

বয়সঃ

ঠিকানাঃ

ফোন নম্বরঃ

সাক্ষাৎকারগ্রহণের তারিখঃ

পর্বঃ ২- সামাজিক জনসংখ্যা সংক্রান্ত তথ্যাবলী ।

ক্রমিক নং	**প্রশ্ন**	**উত্তর**
১০১	অংশগ্রহণকারীর লিঙ্গ	১ = পুরুষ ২ = মহিলা
১০২	অংশগ্রহণকারীর বৈবাহিক অবস্থা	১= অবিবাহিত ২ = বিবাহিত ৩ = বি্ধবা ৪ = তালাকপ্রাপ্ত ৫= অন্যান্য: .....
১০৩	অংশগ্রহণকারীর শিক্ষাগত যোগ্যতা	১= নিরক্ষর ২=প্রাথমিক শিক্ষা

		৩= এসএসসি ৪=এইচএসসি ৫ = স্নাতক ৬=স্নাতকোত্তর
১০৪	আপনার পেশা কি?	১= সরকারি চাকরি ২ = ব্যক্তিগত পরিষেবা ৩ = ব্যবসায়ী ৪= গৃহিণী ৫ = শ্রমিক ৬ = বেকার ৭= অন্যান্য ……
১০৫	আপনার বসবাসের এলাকা কি?	১=শহর ২=গ্রাম ৩= উপশহর
১০৬	পরিবারের ধরন	১= একক পরিবার ২= যৌথ পরিবার
১০৭	আপনার মাসিক পারিবারিক আয় কত?	..... টাকা
১০৮	আপনার পরিবারে কতজন সদস্য আছে?	.....জন

পর্বঃ ৩- অস-ওয়েস্ট্রি ঘাড় ব্যথার অক্ষমতা সংক্রান্ত প্রশ্নাবলীঃ

নির্দেশাবলীঃ অনুগ্রহ করে আপনার জন্য সবচেয়ে প্রযোজ্য একটি বাছাই করে প্রতিটি বিভাগের উত্তর দিন

বিভাগ ১ - ব্যথার তীব্রতা

0) এই মুহূর্তে আমার কোনো ব্যথা নেই।
1) এই মুহূর্তে ব্যথা খুবই হালকা।
2) এই মুহূর্তে ব্যথা মাঝারি।
3) এই মুহূর্তে ব্যথা মোটামুটি তীব্র।
4) এই মুহূর্তে ব্যথা খুব প্রবল।
5) ব্যথা এই মুহূর্তে কল্পনা করা সবচেয়ে খারাপ

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

0) আমি অতিরিক্ত ব্যথা না করেই নিজের যত্ন নিতে পারি।
1) আমি সাধারণত নিজের যত্ন নিতে পারি, কিন্তু এতে অতিরিক্ত ব্যথা হয়।
2) নিজের দেখাশোনা করা বেদনাদায়ক এবং আমি ধীরগতির এবং সতর্ক।
3) আমার কিছু সাহায্য দরকার, কিন্তু আমার ব্যক্তিগত যত্নের অধিকাংশই পরিচালনা করি।
4) আত্ম-যত্নের বেশিরভাগ ক্ষেত্রেই আমার প্রতিদিন সাহায্যের প্রয়োজন।
5) আমি পোশাক পরি না; আমি কষ্ট করে ধুয়ে বিছানায় শুয়ে থাকি ।

বিভাগ ৩– উত্তোলন

0) আমি অতিরিক্ত ব্যথা ছাড়াই ভারী ওজন তুলতে পারি।
1) আমি ভারী ওজন তুলতে পারি, কিন্তু এটি অতিরিক্ত ব্যথা দেয়।
2) ব্যথা আমাকে মেঝে থেকে ভারী ওজন তুলতে বাধা দেয়, তবে আমি পরিচালনা করতে পারি যদি সেগুলি সুবিধাজনকভাবে অবস্থান করে, উদাহরণস্বরূপ, টেবিলে।
3) ব্যথা আমাকে ভারী ওজন তুলতে বাধা দেয়, তবে আমি হালকা থেকে মাঝারি ওজন পরিচালনা করতে পারি যদি সেগুলি সুবিধাজনকভাবে অবস্থান করে।
4) আমি খুব হালকা ওজন তুলতে পারি।
5) আমি কিছুতেই তুলতে বা বহন করতে পারি না।

বিভাগ ৪ – পড়া

0) আমার ঘাড়ে ব্যথা ছাড়াই আমি যত খুশি পড়তে পারি।
1) আমার ঘাড়ে সামান্য ব্যথা নিয়ে আমি যত খুশি পড়তে পারি।
2) আমি আমার ঘাড়ে মাঝারি ব্যথা নিয়ে যত খুশি পড়তে পারি।
3) আমার ঘাড়ে মাঝারি ব্যথার কারণে আমি যতটা চাই ততটা পড়তে পারি না।
4) আমার ঘাড়ে প্রচণ্ড ব্যথার কারণে আমি যতটা চাই ততটা পড়তে পারি না।
5) আমি মোটেও পড়তে পারি না

বিভাগ ৫ – মাথাব্যথা

0) আমার কোনো মাথাব্যথা নেই।
1) আমার সামান্য মাথাব্যথা আছে যা প্রায়ই আসে।
2) আমার মাঝারি মাথাব্যথা আছে যা প্রায়ই আসে।
3) আমার মাঝারি মাথাব্যথা আছে যা ঘন ঘন আসে।
4) আমার প্রচণ্ড মাথাব্যথা আছে যা প্রায়ই আসে।
5) আমার প্রায় সব সময়ই মাথাব্যথা থাকে

বিভাগ ৬ – মনোযোগ

0) আমি কোন অসুবিধা ছাড়াই যখন চাই তখন পুরোপুরি মনোনিবেশ করতে পারি।
1) আমি সামান্য অসুবিধার সাথে যখন চাই তখন পুরোপুরি মনোনিবেশ করতে পারি।
2) যখন আমি চাই তখন মনোযোগ দিতে আমার যথেষ্ট অসুবিধা হয়।
3) আমি যখন চাই তখন মনোযোগ দিতে আমার অনেক অসুবিধা হয়।
4) যখন আমি চাই তখন মনোযোগ দিতে আমার অনেক অসুবিধা হয়।
5) আমি মোটেও মনোযোগ দিতে পারি না।

বিভাগ ৭- কাজ

0) ১)আমি যত কাজ করতে চাই ততটুকু করতে পারি।
1) আমি শুধু আমার স্বাভাবিক কাজ করতে পারি, কিন্তু আর কিছু না।
2) আমি আমার স্বাভাবিক বেশিরভাগ কাজই করতে পারি না।
3) আমি আমার স্বাভাবিক কাজ করতে পারি না।
4) আমি খুব কমই কোনো কাজ করতে পারি।
5) আমি কোনো কাজই করতে পারি না

বিভাগ ৮ – ভ্রমণ

0) আমি ঘাড় ব্যথা ছাড়াই যেকোনো জায়গায় ভ্রমণ করতে পারি।
1) আমার ঘাড়ে সামান্য ব্যথা নিয়ে আমি যতক্ষণ চাই গাড়ি ভ্রমণ করতে পারি।
2) আমার ঘাড়ে মাঝারি ব্যথা নিয়ে আমি যতক্ষণ চাই ততক্ষণ গাড়ি ভ্রমণ করতে পারি।
3) আমার ঘাড়ে মাঝারি ব্যথার কারণে আমি যতক্ষণ চাই ততক্ষণ গাড়ি ভ্রমণ করতে পারি না।
4) আমার ঘাড়ে তীব্র ব্যথার কারণে আমি খুব কমই গাড়ি ভ্রমণ করতে পারি।
5) আমি মোটেও গাড়ি ভ্রমণ করতে পারি না।

বিভাগ ৯- ঘুমানো

0) আমার ঘুমের কোনো সমস্যা নেই।
1) আমার ঘুম কিছুটা ব্যাহত হয় (১ ঘণ্টার কম ঘুমহীন)।
2) আমার ঘুম হালকাভাবে ব্যাহত হয় (1-2 ঘন্টা ঘুমহীন)।
3) আমার ঘুম মাঝারিভাবে ব্যাহত হয় (2-3 ঘন্টা নিদ্রাহীন)।
4) আমার ঘুম ব্যাপকভাবে ব্যাহত (3-5 ঘন্টা নিদ্রাহীন)।
5) আমার ঘুম সম্পূর্ণভাবে ব্যাহত হয় (5-7 ঘন্টা নিদ্রাহীন)

বিভাগ ১০ – বিনোদন

0) আমি ঘাড় ব্যথা ছাড়াই আমার সমস্ত বিনোদনমূলক ক্রিয়াকলাপে নিযুক্ত থাকতে পারি।
1) আমি আমার ঘাড়ে কিছু ব্যথা সহ আমার সমস্ত বিনোদনমূলক ক্রিয়াকলাপে নিযুক্ত হতে পারি।
2) আমার ঘাড়ে ব্যথার কারণে আমি বেশিরভাগ ক্ষেত্রেই নিয়োজিত হতে পারি, কিন্তু আমার সমস্ত বিনোদনমূলক ক্রিয়াকলাপ শেষ করতে পারি না।
3) আমার ঘাড়ে ব্যথার কারণে আমি আমার কয়েকটি বিনোদনমূলক কাজে নিয়োজিত হতে পারছি।
4) আমার ঘাড়ে ব্যথার কারণে আমি খুব কমই কোনো বিনোদনমূলক কাজ করতে পারি।
5) আমি কোনো বিনোদনমূলক কাজ করতে পারি না

মোট স্কোর = × ১০০ = ---------- %

পর্বঃ ৪- ব্যথার জন্য নিউমেরিক পেইন রাটিং স্কেল।

অনুগ্রহ করে ০ (কোন ব্যথা নেই) থেকে ১০ (সবচেয়ে খারাপ ব্যথা) স্কেলে, আপনি গত 24 ঘন্টায় আপনার সব থেকে খারাপ ব্যথার মাত্রার তীব্রতা নির্দেশ করুন।