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Neck mobility and functioning of patients with chronic neck pain at a selected rehabilitation centre in Bangladesh

Jannatul Ferduse Eti

Bachelor of Science in Physiotherapy (B.Sc. PT)

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CRP, Dhaka-1343

Bangladesh Health Professions Institute

Department of Physiotherapy

CRP, Savar, Dhaka-1343, Bangladesh

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We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for acceptance of this dissertation entitled, **"Neck mobility and functioning of patients with chronic neck pain at a selected rehabilitation centre in Bangladesh"** Submitted by **Jannatul Ferduse Eti**, for the partial fulfillment of the requirement for the degree of Bachelor of Science in Physiotherapy (BSc. PT).

.....

Muhammad Millat Hossain
Associate Professor
Project and Course Coordinator
Department of Rehabilitation Science
BHPI, CRP.

.....

Prof. Dr. Mohammad Sohrab Hossain, PhD
Professor of Physiotherapy, BHPI
Executive Director, CRP.

.....

Mohammad Habibur Rahman
Assistant Professor of Physiotherapy
School of Science and Technology
Bangladesh Open University, Gazipur-1750.

.....

Prof. Md. Obaidul Haque
Vice Principal
BHPI, CRP.

.....

Dr. Shazal Kumar Das, PhD
Assistant Professor & Head
Department of Physiotherapy
BHPI, CRP.

Approved Date: 10, 08, 25

Declaration

I hereby declare that the present dissertation entitled **'Neck mobility and functioning of patients with chronic neck pain at a selected rehabilitation centre in Bangladesh'** is an original work of my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also declare that for any publication, presentation, or dissemination of the study. I would be bound to take written consent from the Department of Physiotherapy, Bangladesh Health Professions Institute (BHPI).

Signature: Jannatul Ferduse Eti Date: 10.08.25

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Acronyms

BHPI	Bangladesh Health Professions Institute
BMI	Body Mass Index
BMRC	Bangladesh Medical Research Council
CROM	Cervical Range of Motion
CRP	Centre for the Rehabilitation of the Paralysed
IRB	Institutional Review Board
NDI	Neck Disability Index
NP	Neck Pain
ROM	Range of Motion
SPSS	Statistical Package of Social Science
VAS	Visual Analog Scales
WHO	World Health Organization

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Abstract

Background: Chronic neck pain is a prevalent musculoskeletal condition that impairs cervical mobility and daily functioning, often accompanied by significant pain and disability. **Objective:** To find out neck mobility, pain intensity, and functional limitation and how these variables are associated with each other in patients with chronic neck pain at a selected rehabilitation centre in Bangladesh. **Methodology:** A cross-sectional study was conducted on 55 patients with chronic neck pain at the Musculoskeletal Outpatient Unit of the Centre for the Rehabilitation of the Paralysed (CRP), Savar. Data were collected using a semi structured questionnaire, Visual Analogue Scale (VAS), and the Neck Disability Index (NDI) Scale. Cervical ROM was measured using a goniometer. Statistical analysis included descriptive statistics and inferential statistical, the inferential statistical has been calculated by chi-square and Pearson correlation tests. **Result:** Among 55 participants who had chronic neck pain, their overall age Mean ± SD was 40.75 (±11.95) years. Most showed reduced ROM compared to normative values. 70.9 % of the participants experienced neck pain 4-6 score in VAS scale and 29.1 % of the participants experienced neck pain 7-10 score in VAS scale. Moderate to severe disability was prevalent, with 50.9% experiencing moderate and 40% experiencing severe disability. Age category was significantly associated with all directions of cervical ROM, pain severity (p=.028), and level of disability (p=.043), while gender showed a significant association only with pain severity. Significant weak to moderate negative correlations were found between range of motion (particularly flexion, extension, right lateral flexion) with both pain intensity and disability. However, pain intensity and disability were not significantly correlated ($r = 0.152$, $p = 0.268$). **Conclusion:** The findings suggest a significant relationship between cervical range of motion and pain intensity, as well as between range of motion and functional limitations in patients with chronic neck pain. However, pain intensity alone may not predict functional disability.

Keywords: Neck mobility, functional ability, chronic neck pain, Bangladesh.

CHAPTER-I: INTRODUCTION

1.1 Background

Neck pain is a common musculoskeletal disorder (Thompson et al. 2010, pp.1758-1767), and it is a highly prevalent condition that affects roughly two-thirds of the adult population at some point in their lives (Multanen et al. 2021, pp.1-10), with prevalence estimates ranging from 50% to 85% of the general population experiencing neck pain at some point in their lives (Morales et al. 2020, p.5950). It has a history of recurring and chronic conditions. Neck pain is characterized by exacerbations, and about one-third of patients with neck pain develop chronic symptoms after six months (Bertozzi et al. 2013). Approximately 47% of patients with neck pain at baseline may develop chronic symptoms (Farooq et al. 2018, pp.24-31). In Europe, approximately 15% to 19% of cases progress to a chronic state. According to Claire et al. (2004), 13% of people in Ireland also have persistent neck pain. According to research, women seem to bear the brunt more than men (Cheng et al. 2021, pp.1-12). In the Norwegian population, 14% of men and 17% of women reported having persistent neck pain. In the population of Northern Sweden Guez et al. found an equivalent prevalence of 22% in women and 16% in males. In Finland, the prevalence of chronic neck pain was found to be 7% in women and 5% in men. The UK has likewise indicated a similar prevalence (Ylinen 2007, p.119). Age-specific information revealed that there was a difference in age between men and women. According to Linder et al. (2012), females aged 35-44 are more likely to experience long and medium-term neck pain, while males aged > 65 are more likely to experience the same symptoms.

Neck pain can develops anywhere from the base of the skull (called the occipital condyle) down to the bottom of the neck (Cheng et al. 2021, pp.1-12). Neck discomfort can result from any of the neck's innervated structures, including the discs between the bones, muscles, ligaments, joints, the covering of the spinal cord, or the nerves. However, in the majority of cases, the pathophysiological mechanisms behind neck pain are unknown (Monika et al. 2017).

Cross-sectional studies have suggested that neck discomfort is associated with self-reported general health status, psychological factors such as fear of movement, anxiety or depression, prior neck injury, and a multitude of other factors including occupational tasks and obesity (Croft et al. 2001).Which contributing to mechanical or degenerative changes. Croft et al. (2001) stated this change also happens as a result of poor posture, injury, aging, congenital anomalies and Vos (2006) described the consequences of excessive stress as leading to pain, inflammation, protective spasms, and neurological reflex patterns that ultimately result in chronic neck pain. Most neck pain does not have one simple cause; rather, it results from a number of interrelated conditions that impact on muscles, tendons, and other soft tissues of the neck. Among these factors are sustained and repetitive activities such as talking on the telephone a lot, sitting in front of computer screens or the television, playing a musical instrument, or spending long hours driving. Bland (1994) stated that, distinct occupations have distinct ways of working. So there are several postures for doing job. This pattern of posture has a significant impact on neck pain. Many studies have shown that different occupations have an impact on neck pain levels. According to a Swedish study, neck pain is more common in occupations where employees spend a lot of time in the same posture; this can also occur from household chores (Fredriksson 2002). Another study by Linder, et al. (2012) found that there are risk factors that have a significant impact on chronic neck pain. Age, gender, unbearable physical workload, work related emotional exhaustion, smoking, diabetes, disturbed sleeping provoke chronic neck pain. He also stated that woman suffer more than men due to poor ergonomic working posture.

Chronic neck pain is defined as neck discomfort with symptoms lasting longer than three months (Voulgarakis et al. 2021, pp. 231-237). Clare et al. (2004) state that symptoms of chronic neck pain with its framework started showing after 6 month of acute neck. It is an expensive musculoskeletal disorder in western civilization. Patients with chronic neck pain frequently appear with a number of other signs and symptoms. These may include physical impairments such as decreased cervical movement and altered neuromuscular function of flexor and extensor muscles, as well as psychological discomfort, sadness, and fear avoidance, which can impact quality of life (Hansen et al. 2019, pp.71-78).

Neck pain is most commonly seen in conjunction with asymmetrical restriction of the patient's cervical range of motions (Haslett et al. 2002). The pain can either be limited to the neck region or may come with headaches and dizziness or radiating pain along with paresthesia and numbness of the arm or hand (Vos, 2006). Lee et al. (2017) stated that the upper thoracic spine is involved in the physiologic motion of the neck and the decreased movement of the upper cervical spine can cause excessive movement of the lower cervical spine, increase fatigue in the sternocleidomastoid, anterior scales, and upper trapezius, cause changes of neck postures and breathing patterns, and a decrease in the range of motion.

The cervical spine is highly flexible, providing a wide perception region while also protecting the spinal cord, maintaining head alignment, and forming a framework that aids visceral activities such as glutination and breathing (Syed et al. 2007, pp.2092-2098). The cervical ROM is a measure of the flexibility and mobility of the neck, which is essential for performing daily tasks and activities. Any reduction in cervical ROM can lead to discomfort, limitations in activity, and may contribute to the development and persistence of neck pain. The presence of neck pain and the associated limitations in physical activity can significantly impact the quality of life (Aafreen et al. 2023, pp.3575-3584). People with neck pain frequently struggle to complete an accurate and full range of neck motion while walking, driving, or reacting to external stimuli (Salehi et al. 2021, p.102377).

Patients with chronic neck pain frequently have significant functional restrictions. The patient's perspective on neck pain-related functioning and impairment may be a significant part of determining and agreeing on which aspects of functioning should be addressed in the care of neck pain patients (Andelic et al. 2012, pp. 749-755). Functioning in daily activity is regarded as the most essential measure of health problems, and it has been proposed that a patient's self-evaluation may be more accurate than clinical, biomechanical, or physiological indexes (Lee 2016, pp.175–180). Chiu et al. (2005) stated that to effectively manage neck pain, a thorough physical examination is essential in order to develop a treatment plan that will help the patient reach their treatment objective. It is also crucial to continuously assess the results of treatment.

1.2 Rational:

Chronic neck pain is a common condition affecting a significant portion of the adult population (Farooq et al. 2018). It significantly affects patients' quality of life, daily functioning, and overall well-being. It is often associated with reduced neck mobility, which can further exacerbate pain and limit the ability to perform daily activities (Andelic et al. 2012, pp. 749-755). Despite its prevalence, there is a scarcity of research focusing on the interplay between neck mobility, functional limitations and pain in the Bangladeshi context. This study aims to fill that gap by examining neck mobility, functional limitation and pain severity level of patients with chronic neck pain in a rehabilitation centre, ultimately contributing to the development of more effective rehabilitation. After this study physiotherapists shall get an idea about the neck mobility and level of functional limitation among the patients with chronic neck pain. This idea helps to set up treatment plan according to patient's needs. We can provide better treatment as well as essential advice to the patients. As a health professional it improves our knowledge. Research make the profession strongest. So there is no alternative option to do research as a professional to develop the profession.

1.3 Research question

What is the level of neck mobility and functioning in patients with chronic neck pain at a selected rehabilitation centre in Bangladesh?

1.4 Aim

The aim of this study is to explore neck mobility, pain intensity, and functional limitation and how these variables are associated with each other in patients with chronic neck pain at a selected rehabilitation centre in Bangladesh.

1.5. Objectives

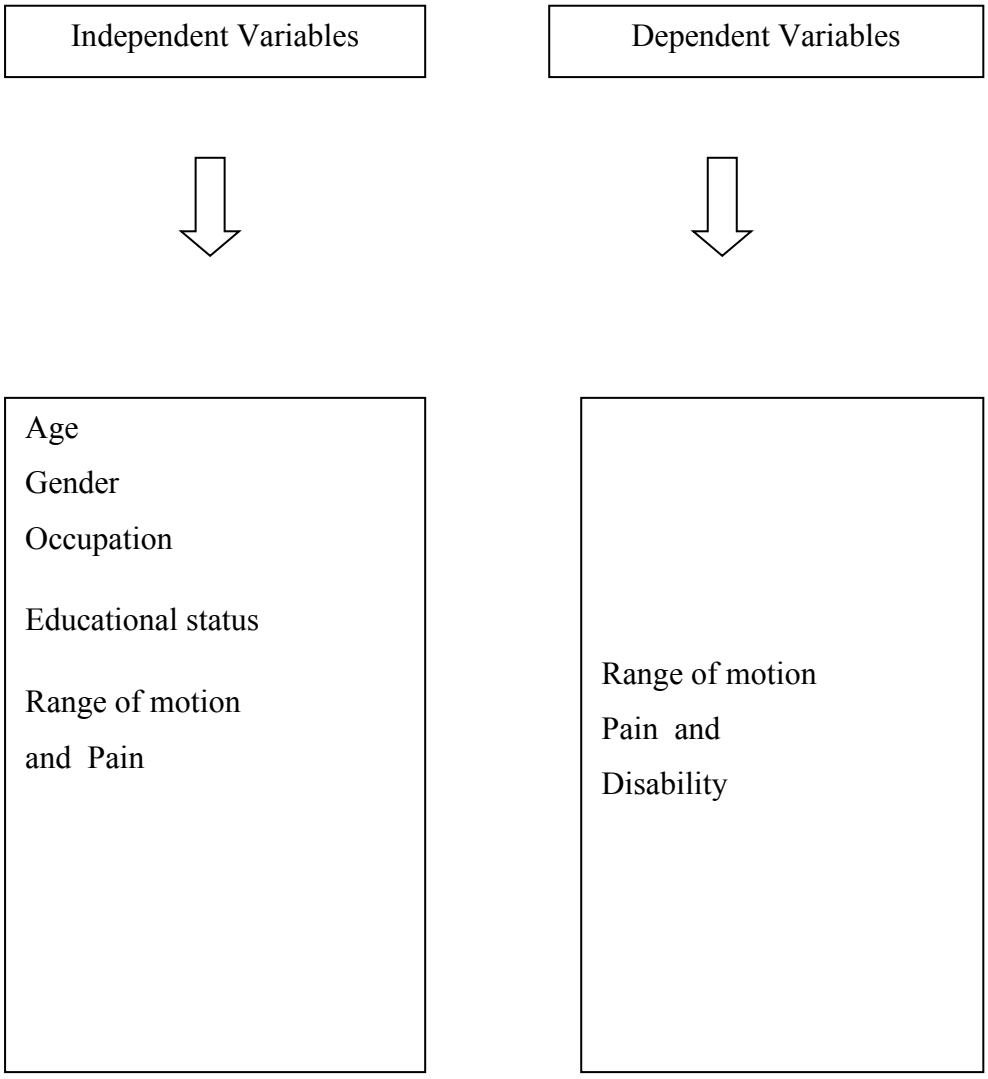
1.5.1 General objective:

To find out neck mobility, pain intensity, and functional limitation and how this variable associated to each other in patients with chronic neck pain at a selected rehabilitation centre in Bangladesh.

1.5.2 Specific objectives:

- To demonstrate the socio-demographic characteristics among the participants.
- To evaluate the cervical range of motion (ROM) in patients with chronic neck pain.
- To explore the pain intensity.
- To determine the functional limitations in patients with chronic neck pain.
- To explore the association between socio-demographic characteristics (such as age, gender, education level and occupation) with neck mobility, pain severity, and the level of disability in patients with chronic neck pain.
- To evaluate the relationship between neck mobility and pain intensity.
- To find out the relationship between neck mobility and disability in patients suffering from chronic neck pain.
- To explore the relationship between pain intensity and disability.

1.6 Conceptual framework:



1.7 Operational definition

Neck pain: Neck pain is the sensation of discomfort in the neck area, which is located between the base of the skull and the top of the shoulders. Neck pain can result from disorders of any of the structures in the neck, including the cervical vertebrae and vertebral disc, nerve, muscles, blood vessels, oesophagus, larynx, trachea, lymphatic organ, thyroid gland or parathyroid gland. Neck pain has a collection of symptoms and complains and sometimes causes disability, but it is not a specific disease. Neck pain arises from numerous different conditions and is sometimes referred to as cervical pain.

Chronic neck pain: Any pain in the anatomical region of the neck with or without radiation to the head, trunk and upper limbs more than 12 weeks is known as chronic neck pain. It is often present on palpation and in both passive and active movements of neck and shoulder regions.

Neck mobility: Neck mobility refers to the range of motion (ROM) in the cervical spine (neck), specifically the ability of the neck to move in multiple directions (flexion, extension, lateral flexion and rotation).

Neck functioning: Neck functioning refers to the ability of a patient with chronic neck pain to perform daily activities that involve the use of the neck, head, and upper body. This includes the ability to complete basic tasks.

CHAPTER-II: LITERATURE REVIEW

Neck pain is a common issue that affects both personal well-being and social life, and it is a leading contributor to work-related disability (Moffett and Mclean, 2006). It is a feeling of discomfort in the neck. Neck pain can be caused by problems with any of the neck's structures, including the cervical vertebrae and intervertebral discs, nerves, muscles, blood vessels, esophagus, larynx, trachea, lymphatic organs, thyroid gland, or parathyroid glands (Barbuto et al. 2008). Vaajoki (2013) sated that pain in the neck is an unpleasant sensory and emotional experience in the neck area associated with actual or potential tissue damage or described in terms of such damage and it is an unspecified pain symptom rather than a clinical sign. On the other hand, Tanveer et al. (2017) also stated that neck pain (NP) is an unpleasant sensory and emotional experience in the neck region connected with genuine or potential tissue harm or describe as far as such harm. Childs et al. (2008) said that in some people, neck problems maybe the source of pain in the upper back, shoulders or arms and when cervical disc causes pressure on the spinal cord or nerve roots.

The neck is located at the top of the spinal column or spine, supporting the head while also protecting the spinal cord. The neck is made up of seven bones known as cervical vertebrae. These seven vertebrae are known as the bony building blocks of the spine in the neck that surround the spinal cord (Barbuto et al., 2008). In other words, the neck (cervical spine) is made up of vertebrae that start in the upper torso and end at the base of the head (Neck Pain 2000). The neck's structures include the neck muscles, arteries, veins, lymph glands, thyroid gland, parathyroid glands, esophagus, larynx, and trachea. Neck nerves flow via those vertebrae, and various ligaments and muscles are connected to the spine, shoulder blade, and back to improve stability (Barbuto et al. 2008). The cervical spine nerves control different parts of the body depending on their location. There are eight cervical nerves, with each one having a specific role. For example, C1, C2, and C3 control head and neck movement, C4 controls upward shoulder movement and powers the diaphragm, while C5 controls the deltoids and biceps, while C6 controls wrist movement and provides some support for the biceps. C7 helps with the triceps and wrist extension, and C8 is involved in hand movement,

especially finger flexion. Canale and Beaty (2012) stated that the anatomy of the cervical spine differs significantly from that of the thoracic and lumbar spines.

According to physio-pedia, pain can occur when a nerve branching away from the spinal cord is compressed or inflamed, and sensations such as tingling in the upper extremities can help identify the damaged nerve. Sabeen et al. (2013) recommended that, neck pain is a discomfort that can arise anywhere along the neck, from the base of the skull at the level of the ears to the upper back, shoulder, or arm. In rare cases, it can even spread to the finger when a nerve root in either or both hands is affected. This may be chronic or acute. Acute neck pain is defined as pain lasting less than three months, whereas chronic neck pain is defined as discomfort lasting more than three months (Kellicker 2011). Another study conducted by Ceballos-Laita et al. (2022) state that neck pain is one of the most common disorders in the general population. In most cases, it develops into a chronic condition that affects the physical, social, and psychological status of the patients. Chronic neck pain has been closely associated with disability and psychological distress. One of the key factors contributing to this psychological stress could be something called "central sensitization," where the nervous system becomes overly sensitive. Because of this, it's important to assess not only the physical condition of the patient but also their mental state, as both can influence the experience of pain.

Study showed that the prevalence of neck discomfort in Asia was highest in the West and Midwest, but was very low in the South. Most people affected are between the ages of 30 and 50. However, there hasn't been much research on neck pain prevalence in Bangladesh. This study also found that 22.22% of office workers experienced neck pain regularly, while 52.22% reported having neck pain sometimes (Rahman et al.2017). Another study found that neck pain affects 14-71% of young people at some point in their lives, with 19-37% of these cases turning into chronic neck pain (Kanchanomai et al., 2011). Worldwide, the prevalence of chronic neck pain in the general population is about 2.2% (Ceballos-Laita et al., 2022, pp. 393-401). Rahman et al. (2017) stated that the prevalence of chronic neck pain was 41.5% in the United States of America, with middle-age (mean age of 48.9 years) women making up the majority of respondents. In the United Kingdom, the incidence was 34%, while in Australia, it was 27.1%. According to a population-based cohort research conducted in Canada, 0.6% of the population experienced incapacitating neck discomfort

annually, with an annual incidence of 14.6%. According to the World Health Organization (WHO, 2013), approximately 33.64 million lives are lost each year due to the disability caused by neck pain. An epidemiological study has revealed that 54.2% of people suffered neck pain for more than six months. This was lower than the 72% of persons in Finland, Norway, and Sweden who suffer from neck pain, which is higher than the Canadian population (Cassidy et al. 2000).

Ceballos-Laita et al. argued that The exact cause of chronic neck pain is still unclear, of however it could be due to dysfunction of numerous structures in the neck region. Several factors can contribute to chronic neck pain, including age, work, marital status, pillows, and posture and more. Age restrictions were established by various studies. In a study in France, it is observed that, persistent neck discomfort primarily affects those over 37, with mid-generational individuals also being impacted (Cassou et al. 2002). Different jobs require different postures, and these postures can greatly impact neck pain. In a Swedish study, researchers discovered that is covered individuals who labor in the same posture for an extended period of time suffer from neck pain; this can also apply to household duties (Fredriksson 2002). Both men and women are affected by chronic neck pain (Fillingim et al. 2009). According to Rahman et al. (2017), women are more susceptible than men to experience neck pain, as well as to have chronic neck issues that are less likely to subsided away. Women may be more affected due to hormonal changes, poor posture, and conditions like degenerative disc disease, which is a common cause of neck pain (Fillingim et al. 2009). For decades, various academics have explored the relationship between neck pain and housewives (Diepenmaat et al. 2006). Shehri et al. (2018) suggested that poor posture and stress on the musculoskeletal system could lead to neck pain, sometimes caused by things like disc herniation, nerve compression, or fractures. Childs et al. 2008 state that Neck discomfort can be caused by soft tissue abnormalities caused by injury or prolonged wear and tear, which include muscles, ligaments, and nerves surrounding the spine. Pain happens when nerve endings are irritated by deformed structures, and long-term stress from poor posture is often a major cause of neck pain (Sabeen et al. 2013). Neck pain is connected to whiplash-associated disorders, which are most usually caused by motor vehicle accidents (Hoy et al. 2011). Another study found that slightly bent positions, such as the forward head posture, can cause neck pain, increase load by affecting the movement order of the

muscles operating when the arm is raised, and restrict range of motion, all of which reduce the ability to maintain balance and increase the risk of falls and musculoskeletal system injury (Lee and Lee 2017). Other study stated that factors such as Physical workload includes repetitive motion, static posture, poor posture and neck flexion or rotation have significant association with neck pain and psychological factors are also caused neck pain associated with disturbed sleep, headache, depression, anxiety and fear (Leonard et al.2009). Many of these connections are not particular to neck pain, but rather to regional pain syndromes in general (Makela et al. 1991). Chronic neck pain is usually associated with sedentary lifestyles (Hoy et al. 2011). Sedentary lifestyles and fast-paced living are causing increased stress and strain on the upper thoracic and neck regions of the spine (Farooq et al. 2018). Sometimes after taking patient's history it's found that maximum people with chronic pain use more than one pillow or soft pillow. In different studies it's found that the height of pillow and type of pillow is a very influencing factor for neck pain. Pillow used to stabilize the neck during sleep. It supports the cervical spine in a neutral position. But soft pillows disturb the normal alignment of the neck. People use soft pillows for their comfort but after sometime it became their reason of neck pain (Gordon and Susan 2010). Understanding the elements that contribute to the development of neck pain is necessary for prevention. The literature indicates that several physical, psychological, and individual-level factors may influence the probability of gaining neck pain, despite the fact that little is known about the origin of neck pain and the associated disability (Multanen et al. 2021, pp.1-10).

Huang et al. (2022) stated that Chronic neck pain is a common musculoskeletal disease caused by overuse of the neck and upper back muscles or poor posture, and it is often accompanied by a restricted range of motion in the neck and shoulders. Symptoms typically resolve on their own within a few days. However, most people endure symptom recurrence; pain that lasts more than two months without recovery is classified as chronic neck pain, which causes not only upper back discomfort but also functional decline that interferes with daily living, job, and sleep quality, around 10% of people have neck disabilities as a result of ongoing neck pain. Chronic neck pain patient deal with a variety of issues, including proprioception impairment, poor balance, increased forward head posture deformity, and functional limitations such as weakening of the deep bending neck muscles brought on by stimulation of the neck

surface muscles. Furthermore, decreased movement of the cervical spine limits the range of motion of the spine and impairs respiratory function (Lee et al. 2017). Sabeen et al. (2013) said that Mechanical neck pain is characterized by pain in the cervical area, which is frequently accompanied by restricted range of motion and functional restrictions. It is a distressing disorder with significant emotional and personal consequences that reduces quality of life (Fillingim et al. 2009). This lower quality of life may have an influence on activities of daily living.(Kanchanomai et al., 2011).

Diagnosis was recommended as the first tool for successful management of patient's problems (Guzman, et al. 2008). Mintken & Cleland (2012) stated that in case of chronic neck pain, during history taking the duration of symptoms, behavior of pain, deformity of cervical spine and presence of neck disability was urgent to be included. Johnson & Cordett (2014) mentioned that physical examination of the cervical spine combination of general observation, palpation, active, passive, resisted movements and special test for cervical spine. General observation includes examining posture, symmetry, muscle bulk and previous scars should be part of the observation and palpation of the cervical spine may elicit focal tenderness which is the appropriate clinical context may increase the clinician's suspicion for threatening pathology. In emergency case, a plain x ray of cervical spine was recommended for the early diagnosis of the source of neck pain. In contrast, Pompan (2011) reported that magnetic resonance imaging was found highly effective for the diagnosis of neck pain. . A neurological examination most commonly emphasis on any upper (example: cord compression) or lower (nerve root) motor neuron involvement and potential myotomal or dermatomal involvement to localize an anatomical level and provocative technique such as neck compression and upper limb tension tests did not have adequate sensitivity or specificity to be recommended as routine practice (Nee et al. 2012).

The clinical signs of chronic neck pain vary, and it is a complex illness. Because cervical range of motion is a measure that is moderately correlated with pain intensity, disability, and fear of movement, it should be included in the physical examination of people with chronic neck pain in addition to the use of scales or questionnaires to measure things such as pain intensity and disability. This will help to better understand the clinical characteristics. A cheap tool that is frequently used to assess

the range of motion of several joints is goniometry. Concerning the assessment of the goniometry's dependability in determining cervical range of motion (Araujo et al.2024, p.651).

Visual Analog Scales: Usually used to evaluate the degree of pain, the VAS is a subjective instrument.Participants are asked to rate their pain on a 10-cm scale, where 0 means no pain and 10 means unbearable pain (Huang et al., 2022, pp. 7592873).

The NDI is a 10-question survey used to assess how neck pain affects a person's daily life. First introduced in 1991, it is widely used and considered reliable. The questions cover daily activities like personal care, lifting, reading, work, driving, sleeping, and recreational activities, as well as pain intensity, concentration, and headaches. Each answer is scored from 0 (no disability) to 5, and the total score (out of 100) is calculated by adding up all the scores and multiplying by two. A higher NDI score means the person feels more disabled by neck pain (Howell et al., 2012, pp. 18-24). It is the most popular tool for measuring neck pain-related disability (Huang et al., 2022, pp. 7592873).

Mangone et al. (2018) disclaimed that cervical spine diseases are frequent and have serious consequences for individuals, communities, and health-care systems. Patients with cervical spine problems frequently express pain and decreased active and passive cervical ranges of motion (ROMs) A vital function of the cervical spine is precisely turning the head with the appropriate velocity in different situations of daily living activities (Salehi et al. 2021, pp.102377). Several studies have investigated the active and passive range of motion (ROM) in chronic neck pain patients, but only a few have focused on movement consistency (Vogt et al. 2000, pp.206-212). Another study by Kumbhare et al. (2005) found that cervical flexor endurance was more strongly correlated with NDI scores, and longitudinal studies have found that low initial CROM scores predict poorer outcome via NDI scores at one year. Howell et al. (2012) also found that self-perceived disability is correlated with cervical range of motion (CROM) in a sample of patients with chronic neck pain, and that reduced cervical range of motion have been correlated with higher NDI scores. Other literature demonstrates that neck pain is connected with reduced range of motion. Patients suffering from neck pain frequently express difficulty executing quick neck movements in daily life (Bahat et al. 2010, pp.1884-1890). Neck pain affects both

physical and psychological performance. It can impair daily activities and is linked to other functional impairments and disabilities (Luo et al. 2004, pp.61–69).

According to finding of study conducted by Multanen et al. (2021) neck pain has a considerable impact on quality of life and work abilities, imposing a substantial personal and social burden. Several studies have shown significantly reduced cervical ranges of movement (ROM) in both flexion and extension in people with disabling neck pain. Although researchers have suggested a link between impaired neck function and chronic neck pain, it has not been investigated whether patients with severe pain have greater functional deficits than those with mild symptoms (Ylinen et al., 2004). A number of studies have investigated the direct relationship among measures of pain, impairments, and disability (Chiu et al., 2005). Restoring physiological range of motion is essential in the management of cervical spine disorders; thus, proper assessment is critical in quantifying physical disability, determining the best therapeutic interventions, and evaluating their effectiveness (Mangone et al. 2018, pp.342-349). There are various therapies for individuals with persistent non-specific neck pain, and many of them recommend a multidisciplinary approach (Cerezo-Téllez et al. 2018, pp. 1-10). Conservative approaches for neck pain and associated illnesses may include treatment by a general practitioner, physiotherapy, manual therapy, or a combination of these. Physiotherapy is a common intervention for individuals with mechanical neck pain, with roughly 33% seeking treatment from a physiotherapist. Massage, exercise therapy, traction, stretching, transcutaneous electrical nerve stimulation, interferential currents, ultrasound, heat agents, and education are all possible options (Farooq et al. 2018).

Neck pain is an often ailment that can cause substantial limitations. With an aging global population, more study is needed to better understand the predictors and clinical course of neck pain, as well as how neck pain might be prevented and managed more effectively (Hoy et al. 2014). The frequency and magnitudes of motion of the head and neck over lengthy periods of time remain unknown. Characterizing the frequency and amount of cervical motion during typical everyday activities in the community can help to measure normal behavior and disease development, establish treatment goals more clearly, and affect treatment technique design. Such information is vital for physicians, surgeons, and therapists who treat individuals with cervical spine diseases. Understanding the frequency and range of motion occurring during

daily activities may also be beneficial in addressing ergonomic difficulties in occupational contexts and establishing a baseline for disability determination in relation to cervical spine motion (Syed et al. 2007, pp.2092-2098). Postural education and ergonomic suggestions for reducing the risk of injury are centered on improving work posture and equipment design. This includes: Change Posture - To prevent postural fatigue and maximize postural variation, alternate between sitting and standing (Ergonomics Risk Factors, 2007). Self-reported disability and other outcome measures are essential elements of patient evaluation and give the practitioner valuable clinical data (Howell, 2011). Chiu et al. (2005) stated that to effectively manage neck pain, a thorough physical examination is essential in order to develop a treatment plan that will help the patient reach their treatment objective. It is also crucial to continuously assess the results of treatment.

CHAPTER III METHODOLOGY

3.1 Study design

A cross sectional study was conducted among the persons with chronic neck pain. This study was conducted among the population who were diagnosed with chronic neck pain. It was simple, time saving, less expensive and useful for descriptive study. This method was used so that the aim and objectives of the study could be fulfilled.

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3.2 Study site

Musculoskeletal Outpatient Unit, Department of Physiotherapy, Centre for the Rehabilitation of the Paralysed (CRP), Savar, Dhaka-1343.

3.3 Study population

All the chronic neck pain patients according to inclusion & exclusion criteria attended in CRP musculoskeletal unit is considered as the study population.

3.4 Study duration

The study period was from 1st June 2024 to 31th May 2025.

3.5 Duration of data collection

Data were collected in three month. Each participant provided time to collected data. Each interview took approximately 20-25 minutes to complete.

3.6 Method of sample selection

3.6.1 Inclusion criteria:

- Both male and female are included (Cheng et al. 2021, PP.1-12).
- Age >18 years old (Multanen et al.2021, PP.1-10).
- Patients having neck pain symptoms at least 3 months duration (Voulgarakis et al.2021, PP. 231-237).

- Ability to understand and complete the Neck Disability Index (NDI) questionnaire. (Thompson et al. 2010, PP.1758-1767).
- Willingness to participate (Gautam et al, 2014, PP.482-87).

3.6.2 Exclusion criteria:

- History of injury, trauma (Misailidou et al.2010**,** pp.49-59).
- Previous surgery (Lee and kim 2016, pp.175-180.)
- Pregnancy (Misailidou et al.2010, pp.49-59).

3.7 Sample size

When the sample frame is infinite,

$$n = \frac{z^2 pq}{d^2}$$

$$= \frac{(1.96)^2 \times 0.15 \times (1-0.15)}{(0.05)^2}$$

$$= \frac{0.49}{(0.05)^2}$$

$$= 196$$

Where,

n = Sample size

z= linked to 95% confidence interval (use 1.96)

p = expected prevalence, 15.1% (Rahman, 2023)

q = 1- p (expected non-prevalence)

d = margin of error at 5% (standard value of 0.05)

The actual sample size was, n = 196

Actual sample size for the study was 196. As it is an academic thesis, self-funding and data was collected by considering the feasibility and time limitation. 55 samples were selected conveniently.

3.8 Sampling technique

The convenience sampling method was used to choose the sample for this study. This method was the easiest, most cost-effective, and quickest way to select a sample. A convenience sample was a collection of people who (conveniently) meet the criteria for the study.

3.9 Method of data collection

Data Collection Tools: A semi structured questionnaire and demographic information chart were used as a data collection instrument. In that time some other necessary materials were used like pen, pencil, and white paper and clip board. The English questionnaires were converted into Bengali to ask the participants during interviews. Researcher must take permission from each volunteer participant by using a written consent form in Bengali.

Measurement Tools:

Goniometer for neck range of motion (ROM)

A big plastic universal goniometer was utilized to assess active cervical ROM. It is widely used in healthcare settings to assess joint range of motion. Active cervical range of motion measurement has demonstrated moderate to substantial reliability (Farooq et al., 2018).

Visual Analogue Scale (VAS) and Neck Disability Index (NDI)

The severity of the patient's neck pain was evaluated using the visual analog scale (VAS). Patients were requested to describe their current pain by marking a mark on a 10 cm (0-10) horizontal line anchored with 0 indicating “no pain” and 10 indicating “worst possible pain”. It is the most commonly used tools for assessing pain intensity in patients with neck pain. VAS has demonstrated good reliability and validity (Farooq et al., 2018).

50 point. The neck disability scale is used to assess the disability status of people with neck pain. The NDI is a modified version of Vernon and Mior's Oswestry Low Back Pain Disability Questionnaire, with ten items covering pain severity, personal care, lifting, reading, headache, concentration, job, driving, sleeping, and recreation. Each item is rated from 0 (no disability) to 5 (highest disability). The total score is the sum of each completed item expressed as a percentage of the total potential points for all completed items (Salo et al., 2010).

3.10 Data collection procedure

Data were collected directly using questionnaire. Data was collected in face to face interview. At very beginning data collector clarified that the participant had the right to refuse to answer of any question during completing questionnaire. They could withdraw from the study at any time. Researcher also clarified to all participants about the aim of the study. Participants were ensured that any personal information will not be published anywhere. After getting consent from the participants, standard questionnaire was used to collect demographic information and patients complain. Questions will be asked according to the Bangla format. Researcher was ensured a quite environment to avoid distraction and environmental noise. The researcher explained the participants about the aim of the study. Then a consent from was given to participants. It was help to maintain the good rapport so that the researcher got the actual information from the participant’s. Interview was conducted in Bangla so that participants can easily understand the questions. All the data were collected by the researcher herself to avoid mistakes.

3.11 Data analysis

After completing the initial data collection, every questionnaire was checked again to find out any mistake or unclear information. The data was analysis through Statistical package of social science (SPSS) version 25 and data was analyzed through descriptive statistics. Descriptive statistics was used to fulfill research objectives.

3.12 Statistical Test

3.12.1 Determination of the nature of data

The variables were determined as nominal, ordinal, interval, and ratio data and considered their parametric or non-parametric properties based on data type, normality test, and standard procedure (Hicks, 2009).

3.12.2 Determination of statistical test

The statistical has been performed as descriptive and inferential statistics based on parametric or non-parametric properties.

The Descriptive Statics was performed as frequency and percentage in nominal or ordinal data. Mean and standard deviation has been calculated for interval or ratio data.

Table-01: The Inferential Statistics has been performed as follows

Purpose	Variables	Statistical test
Relationship/Association	Two Categorical data (non- parametric data)	Chi square test
	Two parametric data	Pearson correlation test

3.13 Ethical consideration

The researcher maintained some ethical considerations: A Research proposal was submitted to the physiotherapy department of BHPI for approval and the proposal was approved by the faculty members and gave permission initially from the supervisor of the research project and from the course coordinator before conducting the study. The proposal of the dissertation including methodology was presented to the Institutional Review Board (IRB) of Bangladesh Health Professions Institute (BHPI) for oral presentation defense was done in front of the IRB. Then the necessary information was approved by the Institutional Review Board and was permitted to do this research. After getting permission to do this study from the academic institute the researcher started to do it. The researcher had been given permission for data collection from the musculoskeletal unit of Savar, CRP. Researcher followed the Bangladesh Medical Research Council (BMRC) guideline & WHO research guideline. The researcher was eligible to do the study after knowing the academic and clinical rules of doing the study about what should be done and what should not. All rights of the participants were reserved, and the researcher was accountable to the participant to answer any type of study related question.

3.14 Informed consent

Informed consent relates to a state of affairs in which all potential participants receive and understand all the information they need to decide whether they want to participate. This includes information about the study's benefits, risks, funding, and institutional approval. In this study a written consent was given to all participants before the completion of the questionnaire. The investigator explains to the participants about their role in this study. She also explained what type of questions they would be asked and also informed that they are free to ignore questions as their wish. She also assured that he did not foresee any risks or discomfort from their participation. Written consent (appendix) was given to all participants prior to completion of the questionnaire. The researcher explained to the participants about his or her role in this study and aim & objectives of this study. The researcher read the informed consent to the participants. Those who were literate encouraged to sign the

form. The researcher received a written consent from every participants including signature. Those who were illiterate, verbally consent was taken from them. Patients who were not that much cooperative, the career were explained the entire process. So that they can understand about the consent from and their participation was on voluntary basic. The aims and objectives of this study must be informed to the subjects verbally. So, gave the consent from to the subject and explained them. The subjects had the rights to withdraw themselves from the research at any time. It supposed to assured the participants that their name or address would not be used. The information of the subjects might be published in any normal presentation or seminar or writing but they would not be identified. The participants informed by the researcher that the result would not be harmful for them. Ensuring the confidentiality of participant's information, no information has been shared without the research supervisor. At any time the researcher available to answer any additional questions in regard to the study.

CHAPTER:IV RESULTS

Table-02: Socio-demographic information

SL No.	Variable	Types of Variable	Mean (±SD)	Frequency(n)/ Percentage (%)
1	Age	Continuous	40.75(±11.95)	
2	Gender	Nominal		Male=34/61.8% Female= 21/38.2%
3	Religion	Nominal		Muslim= 48/87.3% Hindu= 7/12.7%
4	Occupation	Nominal		Housewife= 15/27.3% Service holder=12/21.8% Business=7/12.7% Retired=2/3.6% Student=3/5.5% Farmer=1/1.8% Driver=2/3.6% Garment worker=5/9.1% Other=8/14.5%
5	Marital Status	Nominal		Married=46/83.6% Unmarried=09/16.4%

6	Educational Level	Ordinal	No formal education=1/1.8% PSC=5/9.1% SSC=22/40% HSC=15/27.3% BSC=8/14.5% Masters and above it=4/7.3%
7	BMI	Ordinal	Underweight=4/7.3% Normal weight=27/49.1% Overweight=15/27.3% Obese=9/16.4%
8	Residential	Nominal	Urban=9/16.4 Semi Urban=17/30.9% Rural=29/52.7%

Table-02: Socio-demographic information

4.1 Age group

The study was conducted on 55 participants with chronic neck pain. Out of the participant the mean age of the participants was 40.75 (±11.95) years. There were several age groups among the 55 participants, about 20% (n=11) participants were between 19-28 years, study showed that 23.6% (n=13) participants were between 29-38 years, about 25.5% (n=14) participants were between 39-48 years 20% (n=11) were between 49-58 and 10.9% (n=6) participants were between 59-68 years. According to data view, the investigator could say that the percentage of chronic neck pain among the patient was highest in between the 39-48 years (Figure-01).

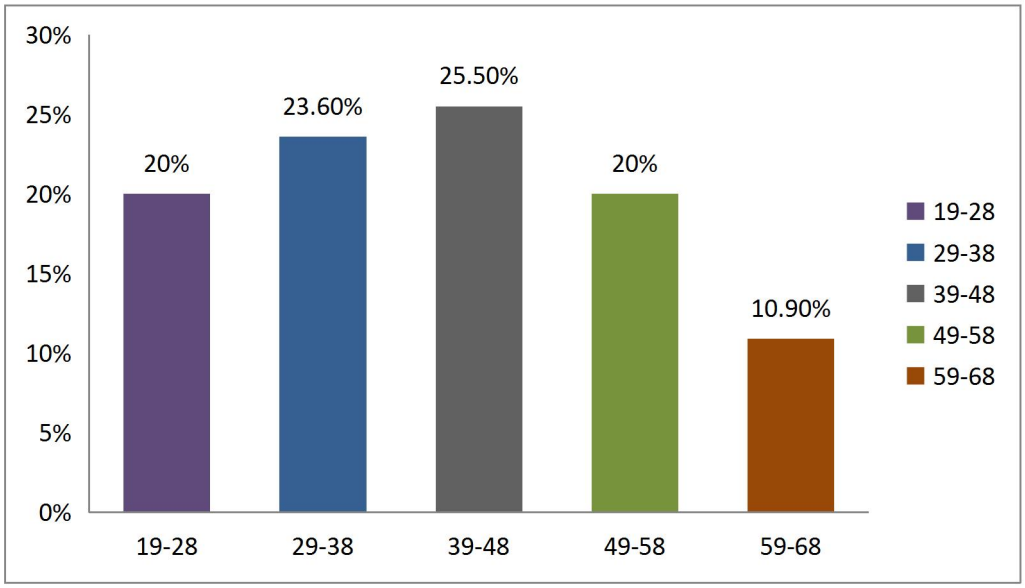

Figure 01: Age groups of the participants.

4.2 Gender of the participant

A total of 55 participants were included as the sample of the study. Among these, most of them were male, comprising 61.8% (n=34), while the rest were female, making up 38.2% (n=21). According to data view, the majority of participants were male and there was a relationship with chronic neck pain (Figure-02).

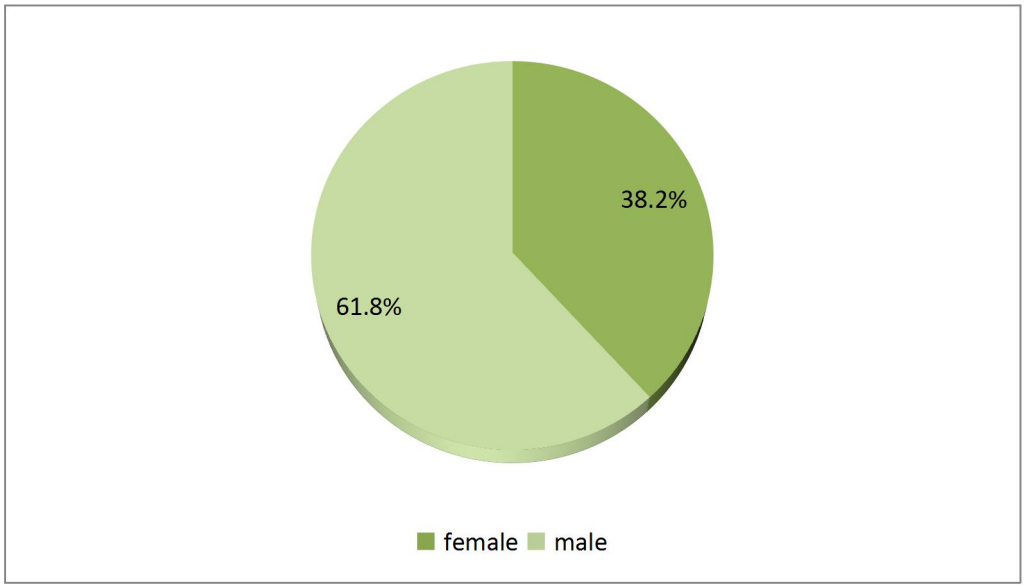

Figure 02: Gender of the participants

4.3 Religion of the participants

Among 55 participants 87.3% (n=48) were Muslim and 12.7% (n=7) were Hindu (Figure-03).

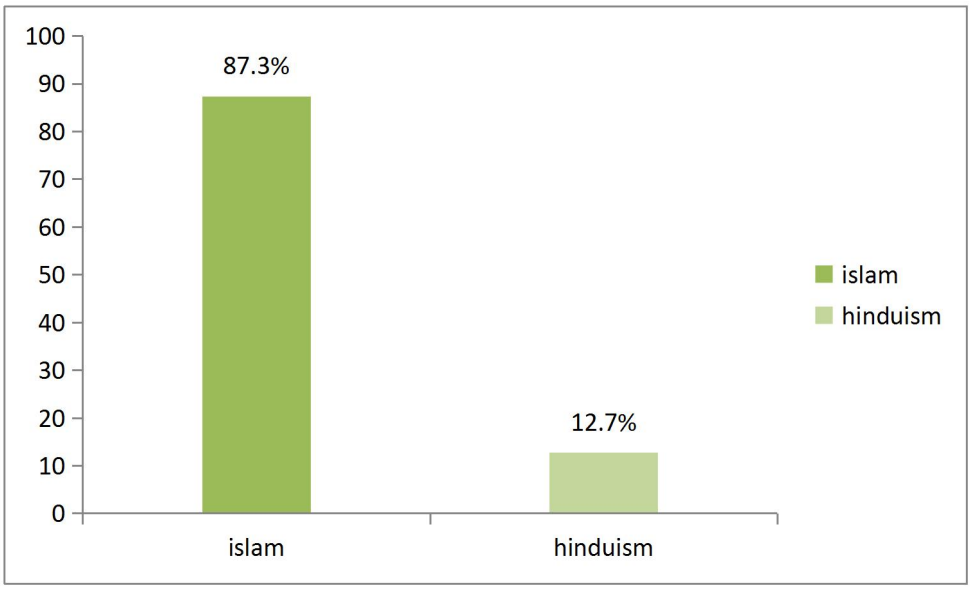

Figure 03 Religion of the participants

4.4 Occupation of the participants

Among 55 participants 27.3% (n=15) were housewife, 21.8% (n=12) were service holder, 12.7% (n=7) were business, 3.6% (n=2) were retired, 5.5% (n=3) were student, 1.8% (n=1) were farmer, 3.6% (n=2) were driver, 9.1% (n=5) garments worker and 14.5% (n=8) were others (Figure-04).

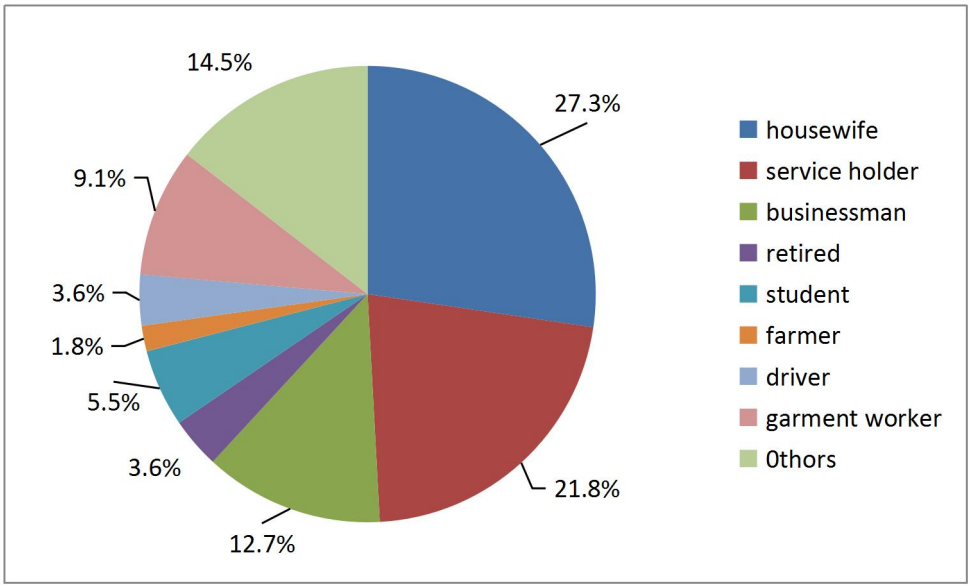

Figure 04 Occupation of the participants

4.5 Marital Status of the participants

Among the 55 participants, 83.6% (n=46) were married, 16.4 % (n=09) were unmarried. So, we have to understand that married persons were mostly affected and vulnerable for experiencing chronic neck pain (Figure-05).

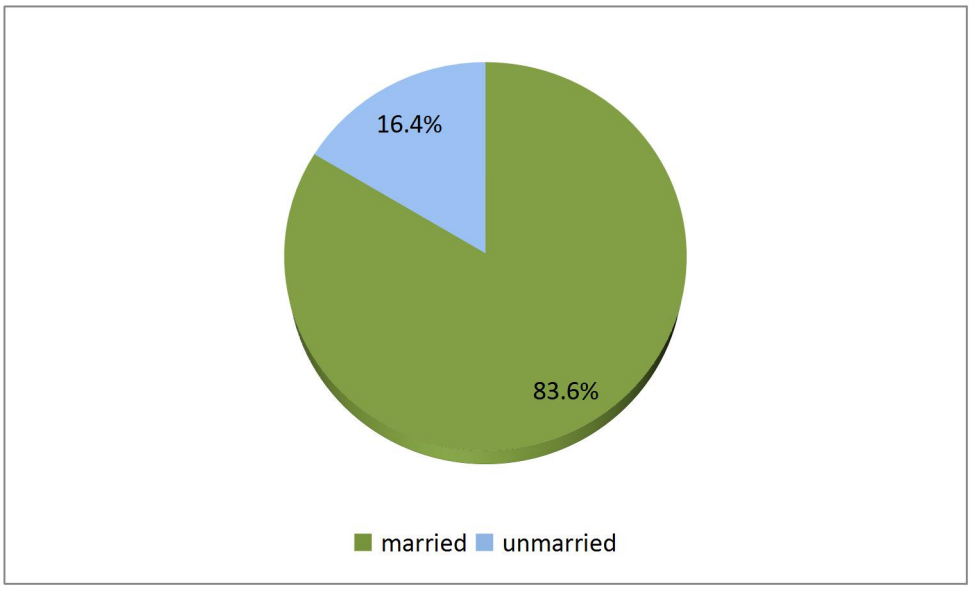

Figure 05 Marital Status of the participants

4.6 Educational level of the participants

Among 55 chronic neck pain participants 1.8% (n=1) participants had no formal education, 9.1% (n=5) participants had primary, 40% (n=22) participants had, 27.3% (n=15) participants had higher Secondary, 14.5% (n=8) participants had graduate and 7.3% (n=4) participants completed masters and above level education (Figure-06).

Figure 06 Educational Level of the participants

4.7 BMI of the participants

Among 55 participants, 7.3% (n=4), were identified as underweight, 49.1% (n=27) of the sample were classified as having a normal BMI. Additionally, 27.3% (n=15) of participants were categorized as overweight, while 16.4% (n=9) were classified as obese. The analysis of body mass index (BMI) categories revealed that the majority of participants fell within the normal weight range (Figure - 07).

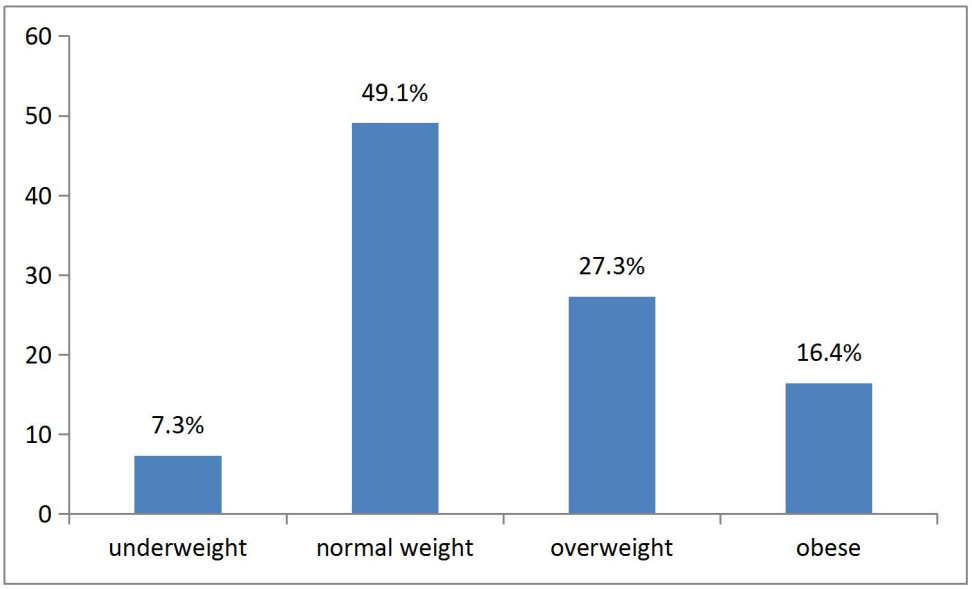

Figure: 07 BMI of the participants

4.8 Living area of the participants

Participants were categorized based on their residential area. **A**mong 55 participants, 16.4% (n=9) lived in urban, 30.9% (n=17) lived in semi urban and 52.7% (n=29) lived in rural area (Figure-08).

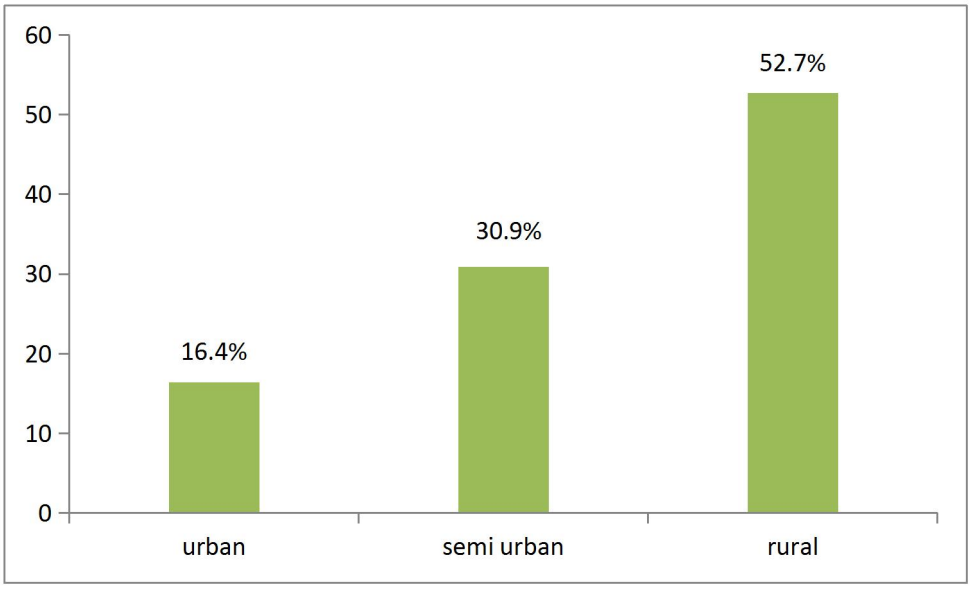

Figure 08 Living Area of the participants

Table-03 Cervical Spine Range of Motions (degree)

Movement	Mean ROM(°) ± SD	Normative ROM(°)
Cervical flexion	34.6±6.44	60
Cervical extension	37.8±7.99	75
Right lateral flexion	33.2±4.96	45
Left lateral flexion	33.7±4.64	45
Right cervical rotation	53.9±17.1	80
Left cervical rotation	54.6±16.5	80

Table-03 Cervical Spine Range of Motions (degree)

A total of 55 participants with chronic neck pain were included in the study. Cervical range of motion (ROM) was assessed in six directions: flexion, extension, right and left lateral flexion, and right and left rotation, using a Goniometer. The mean values (± SD) for cervical ROM were significantly reduced in all directions compared to normative data. Table-03 showed that cervical flexion had a mean ROM of 34.6° ± 6.44°, which is significantly lower than the normative value of 60°. Cervical extension averaged 37.8° ± 7.99°, compared to the normative 75°. Right and left lateral flexion recorded mean ROMs of 33.2° ± 4.96° and 33.7° ± 4.64°, respectively, both below the normative value of 45°. Cervical rotation was also reduced, with right rotation averaging 53.9° ± 17.1° and left rotation 54.6° ± 16.5°, both falling short of the normative 80°. These findings indicate a general reduction in cervical mobility among the study population**.**

4.9 Pain intensity of the participants

Among the 55 participants , who experienced neck pain; 9.1% (n=5) experienced neck pain 4 out of 10 in VAS scale, 29.1% (n=16) experienced neck pain 5 out of 10 in VAS scale, 32.7% (n=18) experienced neck pain 6 out of 10 in VAS scale, 20% (n=11) experienced neck pain 7 out of 10 in VAS scale and 9.1% (n=5) experienced neck pain 8 out of 10 in VAS scale (Figure - 09).

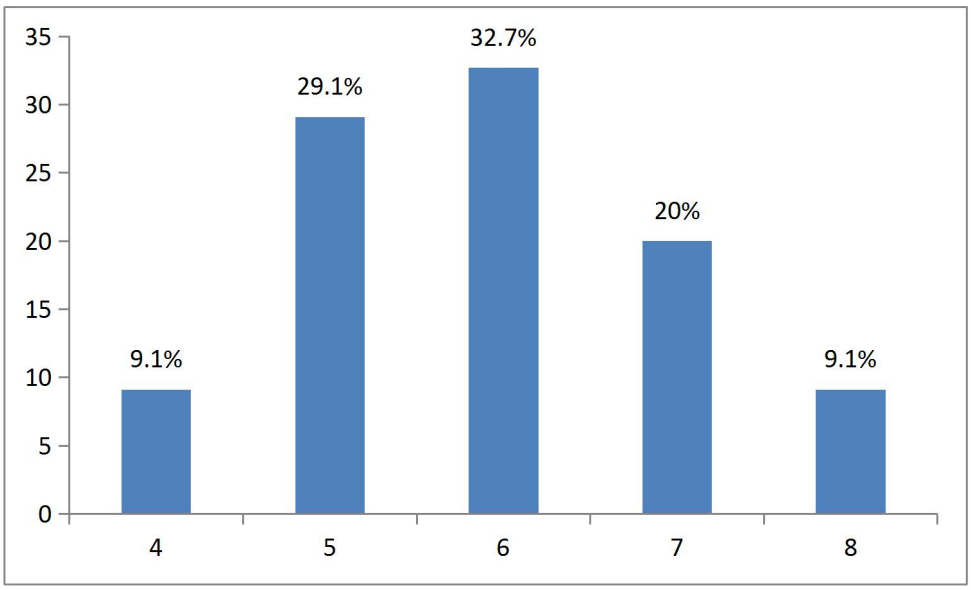

Figure-09 Pain intensity of the participants

4.10 Functional Limitation Categories of the Participants

A total of 55 participants with chronic neck pain were included in the study, the bar graph showed that,(5-14)=mild disability in Neck Disability Index (NDI) scale, (15-24)=moderate disability in Neck Disability Index (NDI) scale, (25-34)=severe disability in Neck Disability Index (NDI) scale and (30-50)= complete disability in Neck Disability Index (NDI) scale. 5.5% (n=3) suffered from mild disability. 50.9% (n=28) suffered from moderate disability. 40% (n=22) participants suffered from severe disability and 3.6% (n=2) suffered from complete disability (Figure-10).

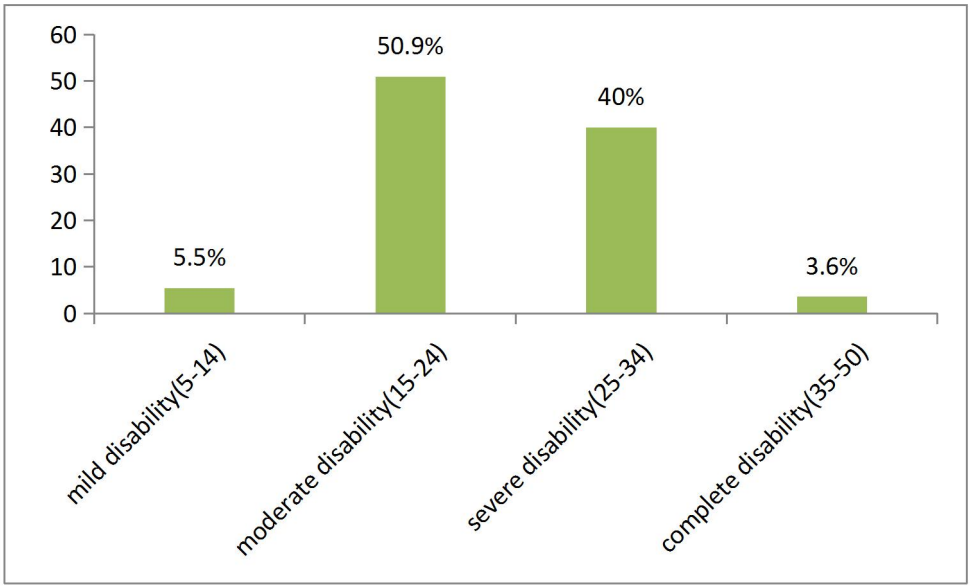

Figure-10 Level of functional limitation among the Participants

4.11.1 Association between demographic variables (age, gender, occupation) and cervical flexion range of motion

In the association test using chi-square, (x2) Here, the dependent variable was cervical flexion range of motion had statistical significant (p=0.01) association with the age category (Table.04).

Cervical flexion range of motion was found no association with gender and occupation (Table.04).

Table-04: Association between demographic variables and cervical flexion range of motion

Dependent Variable: cervical flexion range of motion			
Independent Variable	**Test Value**	**df**	**P-Value**
Age category: 19-28, 29-38, 39-48, 49-58, 59-68	27.658	8	.001
Gender: Male, Female	2.252	2	.324
Occupation: Housewife, Service holder, Business Retired, Student, Farmer, Driver, Garment worker, Other	26.351	16	0.49

4.11.2 Association between demographic variables (age, gender, occupation) and cervical extension range of motion

In the association test using chi-square, (x2) Here, the dependent variable was cervical extension range of motion had statistical significant (p=.000) association with the age category (Table.05).

Cervical extension range of motion was found no association with gender and occupation. (Table.05).

Table-05: Association between demographic variables and cervical extension range of motion

Dependent Variable: cervical extension range of motion			
Independent Variable	**Test value**	**df**	**P-Value**
Age category: 19-28, 29-38, 39-48, 49-58, 59-68	38.81	4	.000
Gender: Male, Female	3.708	1	0.54
Occupation: Housewife, Service holder, Business Retired, Student, Farmer, Driver, Garment worker, Other	15.04	8	.058

4.11.3 Association between demographic variables (age, gender, occupation) and right lateral flexion range of motion

In the association test using chi-square, (x2) Here, the dependent variable was right lateral flexion range of motion had statistical significant (p=.000) association with the age category (Table.06).

Right lateral flexion range of motion was found no association gender and occupation. (Table.06).

Table-06: Association between demographic variables and right lateral flexion range of motion

Dependent Variable: Right lateral flexion range of motion			
Independent Variable	**Test value**	**df**	**P-Value**
Age category: 19-28, 29-38, 39-48, 49-58, 59-68	37.13	12	.000
Gender: Male, Female	4.108	3	.250
Occupation: Housewife, Service holder, Business Retired, Student, Farmer, Driver, Garment worker, Other	17.91	24	.804

4.11.4 Association between demographic variables (age, gender, occupation) and left lateral flexion range of motion

In the association test using chi-square, (x2) Here, the dependent variable was left lateral flexion range of motion had statistical significant (p=.015) association with the age category (Table.07).

Left lateral flexion range of motion was found no association with gender and occupation (Table.07).

Table-07: Association between demographic variables and left lateral flexion range of motion

Dependent Variable: Left lateral flexion range of motion			
Independent Variable	**Test value**	**df**	**P-Value**
Age category: 19-28, 29-38, 39-48, 49-58, 59-68	18.97	8	.015
Gender: Male, Female	2.277	2	.320
Occupation: Housewife, Service holder, Business Retired, Student, Farmer, Driver, Garment worker, Other	13.67	16	.623

4.11.5 Association between demographic variables (age, gender, occupation) right side rotational range of motion

In the association test using chi-square, Here, the dependent variable was right side rotation range of motion had statistical significant (p=.000) association with the age category (Table.08).

Right side rotation range of motion was found no association with gender and occupation. (Table.08).

Table-08: Association between demographic variables right side rotational range of motion

Dependent Variable: Right side rotation

Independent Variable	Test value	df	P-Value
Age category: 19-28, 29-38, 39-48, 49-58, 59-68	48.52	12	.000
Gender: Male, Female	3.103	3	.376
Occupation: Housewife, Service holder, Business Retired, Student, Farmer, Driver, Garment worker, Other	38.31	24	0.32

4.11.6 Association between demographic variables (age, gender, occupation) and left side rotational range of motion

In the association test using chi-square, Here, the dependent variable was left side rotation range of motion had statistical significant (p=.000) association with the age category (Table.09).

Left side rotation range of motion was found no association with gender and occupation (Table.09).

Table-09: Association between demographic variables and left side rotational range of motion

Dependent Variable: Left side rotation			
Independent Variable	**Test value**	**df**	**P-Value**
Age category: 19-28, 29-38, 39-48, 49-58, 59-68	47.17	12	.000
Gender: Male, Female	4.316	3	.229
Occupation: Housewife, Service holder, Business Retired, Student, Farmer, Driver, Garment worker, Other	35.42	24	.062

4.12 Association between demographic variables (age, gender, education, occupation) pain severity

In the association test using chi-square, Here, the dependent variable was pain severity had statistical significant association with the age category and gender (Table.10).

Pain severity was found no association with education and occupation (Table.10).

Table-10: Association between demographic variables and pain severity

Dependent Variable: pain severity			
Independent Variable	**Test value**	**df**	**P-Value**
Age category: 19-28, 29-38, 39-48, 49-58, 59-68	9.874	4	.043
Gender: Male, Female	8.933	1	.003
Education level: No formal education PSC, SSC, HSC, BSC, Masters and above it.	4.234	5	.516
Occupation: Housewife, Service holder, Business Retired, Student, Farmer, Driver, Garment worker, Other	7.619	8	.472

4.13 Association between demographic variables (age, gender, education, occupation) and level of disability

In the association test using chi-square, Here, the dependent variable was level of disability had statistical significant (p=.028) association with the age category (Table.11).

level of disability was found no association with gender, education and occupation (Table.11).

Table-11: Correlations between demographic variables and level of disability:

Dependent Variable: level of disability			
Independent Variable	**Test value**	**df**	**P-Value**
Age category: 19-28, 29-38, 39-48, 49-58, 59-68	22.99	12	.028
Gender: Male, Female	3.156	3	.368
Education level: No formal education PSC, SSC, HSC, BSC, Masters and above it.	11.69	15	.702
Occupation: Housewife, Service holder, Business Retired, Student, Farmer, Driver, Garment worker, Other	21.82	24	.590

4.14.1 Pearson co-relation between cervical flexion range of motion and pain intensity

Null (H0): There is no relationship between cervical flexion range of motion with pain score of VAS scale

Alternative (HA): There has relationship between cervical flexion range of motion with pain score of VAS scale

Test assumption:

1.Two continuous variable

2. Normally distributed

3. Presence of liner association

Level of significance (p value <.05)

Table-12 Pearson correlation between cervical flexion range of motion and pain intensity

Variable 1	Variable 2	Pearson co-relation co-efficient value (r)	P value	Comment/Discussion
Cervical flexion ROM (°)	**Pain intensity (VAS 0–10)**	-.335	.008	Significant negative weak association found

** α value is 0.05. P value is statistically significant if it is less than α value and alternative hypothesis is accepted. If P value is greater than α value then null hypothesis is accepted.

Table-12 showed that there was a significant weak correlation between cervical flexion range of motion (ROM) and pain intensity. The null hypothesis was rejected because (P <.05).And Pearson's correlation coefficient value was -.335, which means perfect negative and weak relationship, therefore it can be concluded that cervical flexion range of motion (ROM) is related to pain intensity.

4.14.2 Pearson co-relation between cervical extension range of motion and pain intensity

Null (H0): There is no relationship between cervical extension range of motion with pain score of VAS scale

Alternative (HA): There has relationship between cervical extension range of motion with pain score of VAS scale

Test assumption:

1.Two continuous variable

2. Normally distributed

3. Presence of liner association

Level of significance (p value <.05)

Table-13 Pearson correlation between cervical extension range of motion and pain intensity.

Variable 1	Variable 2	Pearson co-relation co-efficient value (r)	P value	Comment/Discussion
Cervical extension range of motion (°)	**Pain intensity (VAS 0–10)**	-.522	.000	Significant negative moderate association found

Table-13 showed that there was a significant moderate correlation between cervical extension range of motion (ROM) and pain intensity. The null hypothesis was rejected because (P <.05).And Pearson's correlation coefficient value was -.522, which means perfect negative and moderate relationship, therefore it can be concluded that cervical extension range of motion (ROM) is related to pain intensity.

4.14.3 Pearson co-relation between right lateral flexion range of motion and pain intensity

Null (H0): There is no relationship between right lateral flexion range of motion with pain score of VAS scale

Alternative (HA): There has relationship between right lateral flexion range of motion with pain score of VAS scale

Test assumption:

1.Two continuous variable

2. Normally distributed

3. Presence of liner association

Table-14 Pearson correlation between right lateral flexion range of motion and pain intensity

Variable 1	Variable 2	Pearson co-relation co-efficient value (r)	P value	Comment/Discussion
Right lateral flexion range of motion (°)	**Pain intensity (VAS 0–10)**	-.296	<0.05	Significant negative weak association found

Table-14 showed that there was a significant weak correlation between right lateral flexion range of motion (ROM) and pain intensity. The null hypothesis was rejected because (P <.05).And Pearson's correlation coefficient value was -.296, which means perfect negative and weak relationship, therefore it can be concluded that right lateral flexion range of motion (ROM) is related to pain intensity.

4.14.4 Pearson co-relation between left lateral flexion range of motion and pain intensity

Null (H0): There is no relationship between left lateral flexion range of motion with pain score of VAS scale

Alternative (HA): There has relationship between left lateral flexion range of motion with pain score of VAS scale

Test assumption:

1.Two continuous variable

2. Normally distributed

3. Presence of liner association

Table-15 Pearson correlation between left lateral flexion range of motion and pain intensity

Variable 1	Variable 2	Pearson co-relation co-efficient value (r)	Significant value	Comment/Discussion
Left lateral flexion range of motion (°)	**Pain intensity (VAS 0–10)**	-.373	.005	Significant negative weak association found

Table-15 showed that there was a significant weak correlation between left lateral flexion range of motion (ROM) and pain intensity. The null hypothesis was rejected because (P <.05).And Pearson's correlation coefficient value was -.373, which means perfect negative and weak relationship, therefore it can be concluded that left lateral flexion range of motion (ROM) is related to pain intensity.

4.14.5 Pearson co-relation between right cervical rotation range of motion and pain intensity

Null (H0): There is no relationship between right cervical rotation range of motion with pain score of VAS scale

Alternative (HA): There has relationship between right cervical rotation range of motion with pain score of VAS scale

Test assumption:

1.Two continuous variable

2. Normally distributed

3. Presence of liner association

Table-16 Pearson correlation between right cervical rotation range of motion and pain intensity

Variable 1	Variable 2	Pearson co-relation co-efficient value (r)	Significant value	Comment/Discussion
Right cervical rotation range of motion (°)	**Pain intensity (VAS 0–10)**	-.399	.003	Significant negative weak association found

Table-16 showed that there was a significant weak correlation between right cervical rotation range of motion (ROM) and pain intensity. The null hypothesis was rejected because (P <.05).And Pearson's correlation coefficient value was -.399, which means perfect negative and weak relationship, therefore it can be concluded that right cervical rotation range of motion (ROM) is related to pain intensity.

4.14.6 Pearson co-relation between left cervical rotation range of motion and pain intensity

Null (H0): There is no relationship between left cervical rotation range of motion with pain score of VAS scale

Alternative (HA): There has relationship between left cervical rotation range of motion with pain score of VAS scale

Test assumption:

1.Two continuous variable

2. Normally distributed

3. Presence of liner association

Table-17 Pearson correlation between left cervical rotation range of motion and pain intensity

Variable 1	Variable 2	Pearson co-relation co-efficient value (r)	Significant value	Comment/Discussion
Left cervical rotation range of motion (°)	**Pain intensity (VAS 0–10)**	-.421	.001	Significant negative weak association found

Table-17 showed that there was a significant weak correlation between left cervical rotation range of motion (ROM) and pain intensity. The null hypothesis was rejected because (P <.05).And Pearson's correlation coefficient value was -.421, which means perfect negative and weak relationship, therefore it can be concluded that left cervical rotation range of motion (ROM) is related to pain intensity.

4.15.1 Pearson co-relation between cervical flexion range of motion and disability

Null (H0): There is no relationship between cervical flexion range of motion with Neck Disability Index total score

Alternative (HA): There has relationship between cervical flexion range of motion with Neck Disability Index total score

Test assumption:

1.Two continuous variable

2. Normally distributed

3. Presence of liner association

Level of significance (α value <.05)

Table-18 Pearson correlation between cervical flexion range of motion and disability

Variable 1	Variable 2	Pearson co-relation co-efficient value (r)	Significant value	Comment/Discussion
Cervical flexion ROM (°)	**Neck Disability Index total score**	-.287	.034	Significant negative weak association found

Table-18 showed that there was a significant weak correlation between cervical flexion range of motion and disability. The null hypothesis was rejected because (P <.05). And Pearson's correlation coefficient value was -.287, which means perfect negative and weak relationship, therefore it can be concluded that cervical flexion range of motion is related to disability.

4.15.2 Pearson co-relation between cervical extension range of motion and disability

Null (H0): There is no relationship between cervical extension range of motion with Neck Disability Index total score

Alternative (HA): There has relationship between cervical extension range of motion with Neck Disability Index total score

Test assumption:

1.Two continuous variable

2. Normally distributed

3. Presence of liner association

Level of significance (α value <.05)

Table-19 Pearson correlation between cervical extension range of motion and disability

Variable 1	Variable 2	Pearson co-relation co-efficient value (r)	Significant value	Comment/Discussion
Cervical extension range of motion (°)	**Neck Disability Index total score**	-.284	.036	Significant negative weak association found

Table-19 showed that there was a significant weak correlation between cervical extension range of motion and disability. The null hypothesis was rejected because (P <.05). And Pearson's correlation coefficient value was -.284, which means perfect negative and weak relationship, therefore it can be concluded that cervical extension range of motion is related to disability.

4.15.3 Pearson co-relation between right lateral flexion range of motion and disability

Null (H0): There is no relationship between right lateral flexion range of motion with Neck Disability Index total score

Alternative (HA): There has relationship between right lateral flexion range of motion with Neck Disability Index total score

Test assumption:

1.Two continuous variable

2. Normally distributed

3. Presence of liner association

Table-20 Pearson correlation between right lateral flexion range of motion and disability

Variable 1	Variable 2	Pearson co-relation co-efficient value (r)	Significant value	Comment/Discussion
Right lateral flexion range of motion (°)	**Neck Disability Index total score**	-.358	.007	Significant negative weak association found

Table-20 showed that there was a significant weak correlation between right lateral flexion range of motion and disability. The null hypothesis was rejected because (P <.05). And Pearson's correlation coefficient value was -.358, which means perfect negative and weak relationship, therefore it can be concluded that right lateral flexion range of motion is related to disability.

4.15.4 Pearson co-relation between left lateral flexion range of motion and disability

Null (H0): There is no relationship between left lateral flexion range of motion with Neck Disability Index total score

Alternative (HA): There has relationship between left lateral flexion range of motion with Neck Disability Index total score

Test assumption:

1.Two continuous variable

2. Normally distributed

3. Presence of liner association

Table-21 Pearson co-relation between left lateral flexion range of motion and disability

Variable 1	Variable 2	Pearson co-relation co-efficient value (r)	Significant value	Comment/Discussion
Left lateral flexion range of motion (°)	**Neck Disability Index total score**	-.194	.155	No significant association found

Table-21 showed that there was no statistically significant relationship between left lateral flexion range of motion (ROM) and disability. The null hypothesis was failed to be rejected because (P >.05) therefore it can be concluded that left lateral flexion range of motion (ROM) is not related to disability.

4.15.5 Pearson co-relation between right cervical rotation range of motion and disability

Null (H0): There is no relationship between right cervical rotation range of motion with Neck Disability Index total score

Alternative (HA): There has relationship between right cervical rotation range of motion with Neck Disability Index total score

Test assumption:

1.Two continuous variable

2. Normally distributed

3. Presence of liner association

Table-22 Pearson correlation between right cervical rotation range of motion and disability

Variable 1	Variable 2	Pearson co-relation co-efficient value (r)	Significant value	Comment/Discussion
Right cervical rotation range of motion (°)	**Neck Disability Index total score**	-.252	.063	No significant association found

Table-22 showed that there was no statistically significant relationship between right cervical rotation range of motion (ROM) and disability. The null hypothesis was failed to be rejected because (P >.05) therefore it can be concluded that right cervical rotation range of motion (ROM) is not related to disability.

4.15.6 Pearson co-relation between left cervical rotation range of motion and disability

Null (H0): There is no relationship between left cervical rotation range of motion with Neck Disability Index total score

Alternative (HA): There has relationship between left cervical rotation range of motion with Neck Disability Index total score

Test assumption:

1.Two continuous variable

2. Normally distributed

3. Presence of liner association

Table-23 Pearson correlation between left cervical rotation range of motion and disability

Variable 1	Variable 2	Pearson co-relation co-efficient value (r)	Significant value	Comment/Discussion
Left cervical rotation range of motion (°)	**Neck Disability Index total score**	-.229	.092	No significant association found

Table-23 showed that there was no statistically significant relationship between left cervical rotation range of motion (ROM) and disability. The null hypothesis was failed to be rejected because (P >.05) therefore it can be concluded that left cervical rotation range of motion (ROM) is not related to disability.

4.16 Pearson co-relation between pain intensity and disability

Null (H0): There is no relationship between pain intensity with Neck Disability Index total score

Alternative (HA): There has relationship between pain intensity with Neck Disability Index total score

Test assumption:

1.Two continuous variable

2. Normally distributed

3. Presence of liner association

Table-24 Pearson co-relation between pain intensity and disability.

Variable 1	Variable 2	Pearson co-relation co-efficient value (r)	Significant value	Comment/Discussion
Pain intensity (VAS 0–10)	**Neck Disability Index total score**	.152	.268	No significant association found

Table-24 showed correlation between pain intensity and disability. There was a very weak positive correlation between the two variables, r = .152, p= .268, which was not statistically significant because (p > 0.05).

CHAPTER-V DISCUSSION

The aim of the study was to explore mobility restrictions, pain intensity, and functional limitation and how these variables are associated with each other in patient with chronic neck pain at a selected rehabilitation centre in Bangladesh. This study was based on data collected from patients with chronic neck pain who came to CRP (Centre for the Rehabilitation of the Paralysed) to receive treatment. A total of 55 participants with chronic neck pain were included in this descriptive study.

The study found that mean age of the participant was 40.75 (± 11.95) years. The study involved 55 participants who were divided into various age groups, ranging from 19 to 68 years. However, the findings indicated that individuals between the ages of 39-48 and 29-38 experienced the highest proportion of neck pain, accounting for 25.50% and 23.60% of the affected individuals, respectively. A similar finding was observed in a study conducted by Binder (2007), who found that people between the ages of 35 and 49 had the highest prevalence of persistent neck pain. This alignment between our findings and the existing literature provides support for the conclusions drawn in this study.

Regarding gender distribution, the current study found that 61.8% (n=34) of the participants were male, while 38.2% (n=21) were female. The other study In United States, there is found that 9.5% of the men and 13.5% of the women were highly affected on neck pain (Makela et al., 1991). Religious and cultural demographics indicated that the majority of the participants (87.3%, n=48) were Muslim, which reflects the general population distribution of Bangladesh. In this study occupational data revealed that 27.3% (n=15) were housewife, 21.8% (n=15) were service holder, 12.7% (n=7) were businessmen, 3.6% (n=2) were retired, 5.5% (n=3) were student, 1.8% (n=1) were farmer, 3.6% (n=2) were driver, 9.1% (n=5) and 14.5% (n=8) were others. According to this study, It also found that among all the participants of neck pain 83.6% participants were married and 16.4% participants were unmarried. That is highlights that understand that married person are mostly affected and they are mostly vulnerable for experiencing neck pain. According to a study conducted in University Kebangsaan Malaysia Medical Centre, Most of them were married and that is 72.3%

when compared to 27.7% were single. So the investigator could said that the literature support the result of this study (Mustafa & Sutan, 2012).The education level of the participants showed that secondary passed participants were highest rate that was about 40% (n=22), Higher Secondary passed participants were second highest rate that was 27.3% (n=15), Primary, BSC, Masters passed participants frequency were 9.1%,14.5%,7.3%. In terms of BMI, majority of the participants were normal weight (49.1%), but a significant portion (27.3%) was classified as overweight, and 16.4% were classified as obese. These findings highlight the importance of managing body weight in preventing or managing chronic musculoskeletal pain. Nilsen, et al. (2011) found significant association between BMI and risk of chronic neck pain significantly.

In these study there were also shown that among the affected group of people 16.4% of the participants with neck pain were coming from urban areas whereas 30.9%, 52.7% of the participants were coming from semi urban, rural areas. In high income countries it had been shown that about 20.7% of the participants with neck pain were coming from urban areas and 17.0% of the participants were from rural areas. In rich countries there were great percentage of having neck pain in urban areas but in developing countries like Bangladesh it is more common in rural areas (Hoy et al., 2010).

In cervical range of motion variable, the mean cervical range of motion (CROM) of participants was significantly reduced in all planes compared to normative values. The most notable reductions were seen in cervical extension (mean =37.8±7.99°, normative =75°) and cervical flexion (mean =34.6±6.44°, normative = 60°). Lateral flexions were moderately reduce, with right and left lateral flexion mean 33.2°±4.96° and 33.7±4.64°, respectively, both below the normative 45°. Cervical rotation showed the least reduction, with right rotation at 53.9±17.1° and left rotation at 54.6°±16.5°, compared to a normative value of 80°. These findings align with existing literature highlighting reduced CROM in individuals with chronic neck pain. These findings are in agreement with Hagen et al. (1997) and Schreiber (1998), who also described reduced cervical movement. Another result has been reported by Demircioğlu and Özkan (2025) who also observed the greatest limitation in cervical flexion and extension, with mean values of 41.18°±5.80° and 39.68°±7.81°, respectively. Lateral flexion was moderately limited in their study as well (right: 37.62°±7.38°, left:

36.12°±7.86°), while rotation was the least affected (right**:** 55.28°±8.27°, left**:** 55.03°±8.59°). So above studies reinforce the pattern of CROM reduction commonly associated with chronic neck dysfunction and emphasize the clinical importance of assessing mobility limitations in all planes. Interventions targeting sagittal plane mobility, especially flexion and extension, may be particularly beneficial in this population.

In this study, 70.9 % of the participants experienced neck pain 4-6 score in VAS scale and 29.1 % of the participants experienced neck pain 7-10 score in VAS scale. The overall distribution of pain severity demonstrates that while some participants experience mild discomfort, the majority report moderate to high levels of pain, with most reporting pain levels in the middle range (5 to 7 out of 10). Merskey and Bogduk (1994) results showed that chronic neck pain tends to fluctuate in intensity but typically remains within moderate ranges, with pain levels often averaging between 4 and 6 on the VAS scale for most patients. Other study by (Vogtet al., 2007), showed that the average pain rating of the patients with chronic neck pain indicated moderate neck pain intensity 3.7 (±0.8). This study's findings highlight the higher prevalence of moderate pain levels.

In terms of functional limitations, the study found that most participants experienced moderate to severe disability as indicated by the Neck Disability Index (NDI) scores. Specifically, 50.9% of participants had moderate disability, while 40% suffered from severe disability. This indicates that neck pain is a condition of moderate disablement, significantly impacting an individual's capacity to handle and engage in everyday activities such as self-care, work, recreation, and concentration (Makendo,2024). Chronic neck pain is a prevalent condition that affects a significant portion of the population and leads to discomfort, functional limitations, and reduced quality of life (Demircioğlu and Özkan 2025). It is a common observation that patients with neck pain of similar intensity and frequency can demonstrate markedly different levels of functional limitation (Luo et al. 2004).

This study showed the strong association between cervical ROM and age category. Pain severity and neck functional limitation were both significantly related to age category ($p = 0.043$ and $p = 0.028$, respectively). These findings support the idea that individuals tend to experience higher levels of pain and greater disability in the

cervical spine. The relationship between pain severity and gender (p = 0.03) also suggests that females may report higher pain levels. This study failed to show statistical association with other socio-demographic (occupation and education). Similarly Makendo discovered that gender, occupation, and employment status had no statistically significant association with pain neck disability levels, as evidenced by the confidence intervals enclosing the null value. The non-significant relationship between these socio-demographic parameters and neck pain disability levels may signal that additional unknown variables or factors beyond the scope from this study could better explain variations in neck pain disability. Moreover, the non-significant findings could also suggest the complexity of neck pain disability, which may be influenced by complex factors other than socio-demographic characteristics alone.

The relationship between cervical range of motion and pain intensity was evaluated using Pearson correlation analysis. The result indicated a series of statistically significant negative correlations between cervical range of motion and pain intensity. Study showed that there have weak association between cervical flexion range of motion and intensity (r=-.335, p=.008), in cervical extension range of motion study revealed that there have moderate association between cervical extension range of motion and pain intensity (r=-.522, p=000) and the study also stated that weak association between right lateral flexion, left lateral flexion, right rotation, left rotation with pain intensity, there value was r=-.296, p<0.05; r=-.373, p=.005; r=-.399, p=.003; r= -.421, p=.001

The relationship between cervical range of motion and disability was evaluated using Pearson correlation analysis. The results revealed a series of correlations, some statistically significant and others not. Significant weak negative correlations were observed in cervical flexion, extension and right lateral flexion range of motion, there value was r=-.287, p=.034; r=-.286, p=.036; r=.358, p=0.07. Others range of motion left lateral flexion, right and left rotation its value was r=-.194, p=.155; r=-252, p=.063; r= -.229, p=.092 they were not significant because variables were not significant (p > 0.05). This range of motion showed very weak relationship with disability. In contrast, Beltran-Alacreu et al. compared the cervical range of motion according to neck disability level and reported that moderate and severe disability was associated with a decrease in range of motion. Meisingset et al. also demonstrated that

a decreased cervical range of motion correlates with a higher level of disability. These findings may suggest that improvements in cervical mobility could eventually affect functional status, or vice versa. Therefore, therapeutic interventions and patient education sessions should be designed to restore cervical mobility as much as possible (Demircioğlu and Özkan 2025).

In examining the relationship between disability and neck pain a chronic state, the results of this study revealed that there had very weak positive correlation between pain and disability (r=.152, p=.268), this correlation was not significant because variables were not significant because $p > 0.05$. Similarly, Kyrosis et al. (2024) reported no significant association between pain intensity and disability in patients with chronic neck pain, which is consistent with the literature. In contrast, many studies show a strong link between disability and pain (Zetterqvist et al., 2017). Specifically, as the level of disability increases, the risk of neck pain chronification tends to decrease. Conversely, as the risk of neck pain chronification rises, the level of disability tends to decrease (Makendo, 2024).

5.1 Limitation:

Complete accuracy is not possible in any research so that some limitation may exist. Regarding this study, there were some limitations or barriers to consider the result of the study as below**:**

The first limitation of this study was its short duration, because here exist some course work of other subject & placement of 3 month. So the result might be generalized lack ability. If enough time was available knowledge on this thesis could be extended. The second limitation of this study was its small sample size. As the study was conducted at selected area of Center for the Rehabilitation of the Paralyzed (CRP) in musculoskeletal unit which might not represent the whole population with neck pain in the context of Bangladesh. There was no available research done in this area in Bangladesh. So, relevant information about chronic neck pain patient for Bangladesh was very limited in this study.

CHAPTER-VI CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This study gives us a primary impression about mobility restrictions, pain intensity, and functional limitation in patients with chronic neck pain at a selected rehabilitation centre in Bangladesh. The study found that majority of participants were male (61.8%) and aged between 39–48 years, with the mean age 40.75 ± 11.95 years. Most participants were married, lived in rural areas, and had at least secondary-level education. In socio-demographic variable with cervical range of motion (ROM), pain severity, and functional limitation, age category showed a statistically significant association with all directions of cervical range of motion (ROM), pain severity, and functional limitation. Gender had a significant association only with pain severity. No significant associations were observed between education, occupation, status with cervical range of motion, pain severity and functional limitation.

The findings reveal a significant reduction in cervical range of motion (ROM) in all directions when compared to normative value. This study showed that patients with chronic neck pain who attended at CRP they have relatively moderate to high levels of pain, and there was a significant negative correlation between cervical mobility and pain intensity. Cervical extension demonstrated the moderate correlation with pain intensity, suggesting that limited extension may be a key factor in the perception of pain. In addition, exercises to increase mobility in the neck area may contribute to improvement in individuals with chronic neck pain.

The results emphasized that a majority of participants reported moderate to severe disability, and the relationship between neck mobility and disability was very weak, some statistically significant and others not, suggesting that other factors may contribute to the degree of disability. These findings may suggest that improvements in cervical mobility could eventually affect functional status .The result also reported no significant association between pain intensity and disability in patients with chronic neck pain. So the next generation of physiotherapy members should continue study regarding this area. It is important to develop research based evidence of

physiotherapy practice in this area. Physiotherapist's practice which is evidence based in all aspect of health care.

6.2 Recommendations

The following recommendations could increase the validity and improve the results of this study:

- A larger study involving increased number of participants may increase the significance of results.
- It will be better to collect samples from the community, different hospitals, clinics, institutes, and organizations in different districts of Bangladesh to generalize the result.
- It will be better to use a random sampling technique instead of the convenient sampling technique.
- Collect data on postural habits, and ergonomic practices. This would help to identify additional contributors to the pain experience and functional limitations in individuals with neck pain.

There was some limitation of this study mentioned in the relevant section; it is recommended to overcome those limitations during the further study. So for further study, it is strongly recommended to increase sample size with adequate time to generalize the result in all of the chronic neck pain survivors in Bangladesh for better results and perspectives.

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APENDIX

1. Consent form (English)

2. Questionnaire (English)

3. Consent form (Bangla)

4. Questionnaire (Bangla)

5. IRB from

6. Permission Letter

Consent Form (English)

Assalamualaikum,

I am Jannatul Ferduse Eti, I am conduction this thesis for B.Sc. in Physiotherapy program titled "**Neck Mobility and Functioning of Patients with Chronic Neck Pain at a Selected Rehabilitation Center in Bangladesh**" by this I would like to know the neck mobility and daily functional activity in patients suffering from chronic neck pain. Now I want to ask some personal, pain, ROM, and disability related question. This will take approximately 20-25 minutes.

I would like to inform you that this is a purely part of my academic activity, and this will not be creating any harm to you . All information provided by you will be treated as confidential and in the event of any report or publication it will be ensured that the source of information remains secret.

Yours participation in this study is voluntary and you may withdraw yourself at any time during this study. You also have the right not to answer a particular question that you do not like or do not want to answer during interview. If you further have any questions on this study, please feel free to ask researcher Jannatul Ferduse Eti , 4th year student, Physiotherapy Department, Bangladesh Health Professions Institute (BHPI), CRP, Savar, Dhaka- 1343.

Do you have your consent to proceed with the interview?

□Yes □ No

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

□Yes □ No

Signature and date of the Participant …….

Signature and date of the Interviewer ……

Signature and date of Witness ……..

Questionnaire (English)

Title: Neck Mobility and Functioning of Patients with Chronic Neck Pain at a Selected Rehabilitation Centre in Bangladesh

Part - 1: Patient's Identification

1.1	Patient's name:	
1.2	Patient ID No:	
1.3	Address:	
1.4	Mobile No:	

Part-2: Socio - Demographic Information

SI.NO.	**Question**	**Response**
2.1	Patient's Age	…… Years
2.2	Sex	□ Male □ Female
2.3	Religion	□ Islam □ Hinduism □ Christian □ Buddhist □ Other
2.4	Occupation	……
2.5	Monthly Income	…….
2.6	Marital Status	□ Married □ Unmarried
2.7	Educational Status	□ Illiterate □ PSC □ SSC □ HSC □ B.Sc. □ Masters and above it
2.8	Height (feet)	…….
2.9	Weight (kg)	……..
2.10	BMI (kg/m2)	……..
2.11	Residential area	□ Urban □ Semi-urban □ Rural

Part-3: ROM Related Information

SI.NO.	Question	Response
3.1	Present range of motion in cervical spine (in degree).	□ Flexion……. □ Extension…… □ Side flexion (Right)……. □ Side flexion (Left)…… □ Rotation (Right)…… □ Rotation (Left)…….

Part- 4: Patient Rated Pain in General:

SI.NO.	Question	Response
4.1	How much pain do you feel in general.	0 10

Part- 5: Disability Related Information:

This questionnaire has been designed to give us information as to how your neck pain has affected your ability to manage in everyday life). Each section of Neck Disability Index (NDI) consists of lowest 0 point and highest 5 points. Total Score= 50 (Obtained Score……		
SI.NO.	**Question**	**Response**
5.1	How much pain do you have today?	□ I have no pain at the moment □ The pain is very mild at the moment □ The pain is moderate at the moment □ The pain is fairly severe at the moment □ The pain is very severe at the moment □ The pain is the worst imaginable at the moment
5.2	How independent are you at personal care (washing, dressing etc.)	□ I can look after myself normally without causing extra pain □ I can look after myself normally but it causes extra pain □ It is painful to look after myself and I am slow and careful □ I need some help but can manage most of my personal care □ I need help every day in most aspects of self-care □ I do not get dressed, I wash with difficulty and stay in bed
5.3	How independent are you during lifting object?	□I can lift heavy weights without extra pain □I can lift heavy weights but it gives extra pain □Pain prevents me lifting heavy weights off the floor, but I can manage if they are conveniently placed, for example on a table □ Pain prevents me from lifting heavy weights 114 but I can manage light to medium weights if they are conveniently positioned □I can only lift very light weights □ I cannot lift or carry anything
5.4	How do you feel while reading newspaper or books?	□ I can read as much as I want to with no pain in my neck □ I can read as much as I want to with slight pain in my neck

		□ I can read as much as I want with moderate pain in my neck □ I can't read as much as I want because of moderate pain in my neck □ I can hardly read at all because of severe pain in my neck □ I cannot read at all
5.5	To which state of headache do you feel?	□I have no headaches at all □ I have slight headaches, which come infrequently □ I have moderate headaches, which come infrequently □I have moderate headaches, which come frequently □ I have severe headaches, which come frequently □ I have headaches almost all the time
5.6	To which level of concentration do you keep during working despite of neck pain?	□ I can concentrate fully when I want to with no difficulty □I can concentrate fully when I want to with slight difficulty □ I have a fair degree of difficulty in concentrating when I want to □ I have a lot of difficulty in concentrating when I want to □I have a great deal of difficulty in concentrating when I want to □ I cannot concentrate at all
5.7	To which state neck pain affect your daily work?	□I can do as much work as I want to □I can only do my usual work, but no more □I can do most of my usual work, but no more □ I cannot do my usual work □ I can hardly do any work at all □ I can't do any work at all
5.8	How do you feel your neck pain during travelling?	□I can travel without any neck pain □ I can travel as long as I want with slight pain 115 in my neck □ I can travel as long as I want with moderate pain in my neck □I can't travel as long as I want because of moderate pain in my neck □ I can hardly travel at all because of severe pain in my neck □ I can't travel at all
5.9	To which state neck pain affect your sleep?	□ I have no trouble sleeping □My sleep is slightly disturbed (less than 1 hr sleepless)

		□My sleep is mildly disturbed (1-2 hrs sleepless) □My sleep is moderately disturbed (2-3 hrs sleepless) □ My sleep is greatly disturbed (3-5 hrs sleepless) □My sleep is completely disturbed (5-7 hrs sleepless)
5.10	To which state your neck pain affect your recreational activities?	□I am able to engage in all my recreation activities with no neck pain at all □ I am able to engage in all my recreation activities, with some pain in my neck □ I am able to engage in most, but not all of my usual recreation activities because of pain in my neck □I am able to engage in a few of my usual recreation activities because of pain in my neck □ I can hardly do any recreation activities because of pain in my neck □I can't do any recreation activities at all

সম্মতি ফর্ম (বাংলা)

আসসালামু আলাইকুম,

আমি জান্নাতুল ফেরদৌস ইতি, আমি বিএসসি ইন ফিজিওথেরাপি প্রোগ্রামে এই থিসিসটি পরিচালনা করছি যার শিরোনাম **"বাংলাদেশের একটি নির্বাচিত পুনর্বাসন কেন্দ্রে দীর্ঘস্থায়ী ঘাড়ের ব্যথা রোগীদের ঘাড়ের গতিশীলতা এবং কার্যকারিতা"** এর মাধ্যমে আমি দীর্ঘস্থায়ী ঘাড় ব্যথায় আক্রান্ত রোগীদের ঘাড়ের গতিশীলতা এবং দৈনন্দিন কার্যক্রম সম্পর্কে জানতে চাই। এখন আমি কিছু ব্যক্তিগত, ব্যথা, গতি পরিসীমা এবং অক্ষমতা সম্পর্কিত প্রশ্ন জিজ্ঞাসা করতে চাই। এটি প্রায় ২০-২৫ মিনিট সময় নেবে।

আমি আপনাকে জানাতে চাই যে এটি সম্পূর্ণরূপে আমার একাডেমিক ক্রিয়াকলাপের একটি অংশ, এবং এটি আপনার কোনও ক্ষতি করবে না । আপনার প্রদত্ত সকল তথ্য গোপনীয় হিসাবে গণ্য করা হবে এবং কোন প্রতিবেদন বা প্রকাশের ক্ষেত্রে এটি নিশ্চিত করা হবে যে তথ্যের উৎস গোপন থাকে।

এই গবেষণায় আপনার অংশগ্রহণ স্বেচ্ছাসেবী ও আপনি এই অধ্যয়নের যে কোনও সময় নিজেকে প্রত্যাহার করতে পারেন। সাক্ষাত্কার এর সময় আপনার পছন্দ নয় বা উত্তর দিতে চান না এমন কোনও নির্দিষ্ট প্রশ্নের উত্তর না দেওয়ার অধিকারও আপনার রয়েছে। এই অধ্যয়ন সম্পর্কে আপনার যদি আরও কোনও প্রশ্ন থাকে তবে দয়া করে নির্দ্বিধায় গবেষক জান্নাতুল ফেরদৌস ইতিকে জিজ্ঞাসা করুন,চতুর্থ বর্ষের শিক্ষার্থী, ফিজিওথেরাপি বিভাগ, বাংলাদেশ স্বাস্থ্য পেশা ইনস্টিটিউট (বিএইচপিআই), সিআরপি, সাভার, ঢাকা-১৩৪৩।

আপনার কি সাক্ষাত্কারটি এগিয়ে যাওয়ার জন্য সম্মতি আছে?

□হ্যাঁ □ না

সুতরাং আমি কি সাক্ষাত্কারটি চালিয়ে যাওয়ার জন্য আপনার সম্মতি পেতে পারি?

□হ্যাঁ □ না

অংশগ্রহণকারীর স্বাক্ষর এবং তারিখ .....

সাক্ষাৎকার গ্রহণকারীর স্বাক্ষর ও তারিখ .....

সাক্ষীর স্বাক্ষর এবং তারিখ .....

প্রশ্নাবলী (বাংলা)

শিরোনাম: বাংলাদেশের একটি নির্বাচিত পুনর্বাসন কেন্দ্রে দীর্ঘস্থায়ী ঘাড় ব্যথা রোগীদের ঘাড়ের গতিশীলতা এবং কার্যকারিতা

পর্ব -১: রোগী সনাক্তকরণ

১.১	রোগীর নাম:	
১.২	রোগীর আইডি নং:	
১.৩	ঠিকানা:	
১.৪	মোবাইল নং:	

পর্ব-২: আর্থ-সামাজিক - জনসংখ্যাতাত্ত্বিক তথ্য

ক্রমিক নং	**প্রশ্ন**	**সাড়া**
২.১	রোগীর বয়স	..... বছর
২.২	যৌনতা	□ পুরুষ □ নারী
২.৩	ধর্ম	□ ইসলাম □ হিন্দু ধর্ম □ খ্রিস্টান □ বৌদ্ধ □ অন্যান্য
২.৪	পেশা	.....
২.৫	মাসিক আয়	.....
২.৬	বৈবাহিক অবস্থা	□ বিবাহিত □ অবিবাহিত
২.৭	শিক্ষাগত যোগ্যতা	□ নিরক্ষর □ পিএসসি □ এসএসসি □ এইচএসসি □বিএসসি □ মাস্টার্স এবং তার উপরে
২.৮	উচ্চতা (ফুট)	.....

২.৯	ওজন (কেজি)	……..
২.১০	বিএমআই (কেজি / এম ২)	……..
২.১১	আবাসিক এলাকা	□ শহর □ আধা-শহুর □ গ্রামীণ

পর্ব-৩:গতি পরিসীমা সম্পর্কিত তথ্য

ক্রমিক নং	**প্রশ্ন**	**সাড়া**
৩.১	সার্ভিকাল মেরুদণ্ডে গতির বর্তমান পরিসীমা (ডিগ্রিতে)।	□ ফ্লেক্সয়ন..... □ এক্সটেনশন..... □ সাইড ফ্লেক্সয়ন (ডানদিকে)..... □ সাইড ফ্লেক্সয়ন (বামদিকে)..... □ ঘূর্ণন (ডানদিকে)..... □ ঘূর্ণন (বামেদিকে).....

পর্ব - ৪: রোগী কতৃক সাধারণ ব্যথা মূল্যায়ন

ক্রমিক নং	**প্রশ্ন**	**সাড়া**
৪.১	আপনি সাধারণভাবে কতটা ব্যথা অনুভব করেন?	০ ১০

পর্ব-৫: প্রতিবন্ধিকতা সম্পর্কিত তথ্যঃ

এই প্রশ্নাবলীটি আপনার ঘাড়ের ব্যথা কীভাবে দৈনন্দিন জীবনে পরিচালনা করার আপনার ক্ষমতাকে প্রভাবিত করেছে সে সম্পর্কে আমাদের তথ্য দেওয়ার জন্য ডিজাইন করা হয়েছে)। ঘাড় প্রতিবন্ধী সূচকের (এনডিআই) প্রতিটি বিভাগে সর্বনিম্ন ০ পয়েন্ট এবং সর্বোচ্চ ৫ পয়েন্ট রয়েছে। মোট স্কোর = ৫০ (প্রাপ্ত স্কোর.....

ক্রমিক নং	**প্রশ্ন**	**সাড়া**
৫.১	আজকের দিনে আপনি কতটা ব্যথা অনুভব করছেন?	□ এই মুহূর্তে আমার কোনো ব্যথা নেই □ ব্যথা এই মুহূর্তে খুব হালকা □ এই মুহূর্তে ব্যথা মাঝারি □ এই মুহূর্তে ব্যথা মোটামুটি তীব্র □ এই মুহূর্তে ব্যথা খুব তীব্র □ ব্যথা এই মুহূর্তে সবচেয়ে খারাপ কল্পনা করা যায় না
৫.২	ব্যক্তিগত যত্নে আপনি কতটা স্বাধীন (ধোয়া, পোশাক পরিধান ইত্যাদি)?	□ আমি স্বাভাবিকভাবে নিজের যত্ন নিতে পারি অতিরিক্ত ব্যথা সৃষ্টি হয় না □ আমি স্বাভাবিকভাবে নিজের যত্ন নিতে পারি তবে এটি অতিরিক্ত ব্যথা সৃষ্টি করে □ নিজের যত্ন নেওয়া বেদনাদায়ক এবং আমি ধীর এবং সতর্ক □ আমার কিছু সাহায্যের প্রয়োজন তবে আমার বেশিরভাগ ব্যক্তিগত যত্ন পরিচালনা করতে পারি □ স্ব-যত্নের বেশিরভাগ ক্ষেত্রে আমার প্রতিদিন সহায়তা প্রয়োজন □ আমি কাপড় পরিধান করতে পারি না ধোয়া কঠিন,বিছানায় শুয়ে থাকি
৫.৩	বস্তু উত্তোলনের সময় আপনি কতটা স্বাধীন?	□আমি অতিরিক্ত ব্যথা ছাড়াই ভারী ওজন তুলতে পারি □আমি ভারী ওজন তুলতে পারি তবে এটি অতিরিক্ত ব্যথা দেয় □ব্যথা আমাকে মেঝে থেকে ভারী ওজন তুলতে বাধা দেয়, তবে সেগুলি যদি সুবিধাজনকভাবে স্থাপন করা হয় তবে আমি পরিচালনা করতে পারি, উদাহরণস্বরূপ একটি টেবিলে □ ব্যথা আমাকে ভারী ওজন উত্তোলন থেকে বাধা দেয় তবে আমি হালকা থেকে মাঝারি ওজন পরিচালনা করতে পারি যদি তারা সুবিধামত অবস্থান করে

		□আমি কেবল খুব হালকা ওজন তুলতে পারি □ আমি কিছু তুলতে বা বহন করতে পারি না
৫.৪	খবরের কাগজ বা বই পড়ার সময় আপনার অনুভূতি কেমন?	□ ঘাড়ে কোনো ব্যথা না থাকায় যত খুশি পড়তে পারি □ ঘাড়ে সামান্য ব্যথা নিয়ে যত খুশি পড়তে পারি □ ঘাড়ে মাঝারি ব্যথা নিয়ে যত খুশি পড়তে পারি □ ঘাড়ে মাঝারি ব্যথার কারণে আমি যতটুকু পড়তে চাই ততটুকু পড়তে পারি না □ ঘাড়ে প্রচণ্ড ব্যথার কারণে আমি খুব কমই পড়তে পারি □ আমি একেবারেই পড়তে পারি না
৫.৫	কোন অবস্থায় আপনি মাথা ব্যথা অনুভব করেন?	□আমার তো কোনও মাথা ব্যথা নেই □ আমার সামান্য মাথাব্যথা হয়, যা প্রায়শই আসে □ আমার মাঝারি মাথাব্যথা হয়, যা খুব কমই আসে □আমার মাঝারি মাথাব্যথা হয়, যা ঘন ঘন আসে □ আমার প্রচণ্ড মাথাব্যথা হয়, যা ঘন ঘন আসে □ আমার প্রায় সব সময় মাথা ব্যথা হয়
৫.৬	ঘাড় ব্যথা সত্ত্বেও কাজের সময় আপনি কোন স্তরে মনোযোগ বজায় রাখেন?	□ আমি যখন চাই তখন পুরোপুরি মনোনিবেশ করতে পারি কোনও অসুবিধা ছাড়াই □একটু কষ্ট করে যখন খুশি মনঃসংযোগ করতে পারি □ আমি যখন চাই তখন মনোনিবেশ করতে আমার মোটামুটি অসুবিধা হয় □ আমি যখন চাই তখন মনোনিবেশ করতে আমার খুব অসুবিধা হয় □আমি যখন চাই তখন মনোনিবেশ করতে আমার প্রচুর অসুবিধা হয় □ কিছুতেই মনঃসংযোগ করতে পারছি না
৫.৭	কোন অবস্থায় ঘাড়ের ব্যথা আপনার দৈনন্দিন কাজকে প্রভাবিত করে?	□আমি যত খুশি কাজ করতে পারি □আমি শুধু আমার স্বাভাবিক কাজ করতে পারি, তবে বেশি করতে পারি না □আমি আমার স্বাভাবিক বেশিরভাগ কাজ করতে পারি, তবে বেশি করতে পারি না □ আমি আমার স্বাভাবিক কাজ করতে পারি না □ আমি প্রায় কোনও কাজ করতে পারি না □ আমি কোনও কাজ করতে পারি না
৫.৮	ভ্রমণের সময় ঘাড়ের ব্যথা কেমন অনুভব করেন?	□আমি কোনও ঘাড় ব্যথা ছাড়াই ভ্রমণ করতে পারি □ ঘাড়ে সামান্য ব্যথা নিয়ে যতক্ষণ ইচ্ছা ঘুরে বেড়াতে পারি □ আমি আমার ঘাড়ে মাঝারি ব্যথা নিয়ে যতক্ষণ চাই ভ্রমণ করতে পারি

		□আমার ঘাড়ে মাঝারি ব্যথার কারণে আমি যতক্ষণ চাই ততক্ষণ ভ্রমণ করতে পারি না □ ঘাড়ে প্রচণ্ড ব্যথার কারণে আমি খুব কমই ভ্রমণ করতে পারি □ আমি তো একেবারেই ভ্রমণ করতে পারি না
৫.৯	ঘাড়ের ব্যথা আপনার ঘুমকে কিভাবে প্রভাবিত করে?	□ আমার ঘুমাতে কোনও সমস্যা নেই □আমার ঘুম সামান্য বিঘ্নিত হয় (১ ঘন্টারও কম নিদ্রাহীন) □আমার ঘুম হালকা বিঘ্নিত হয় (১-২ ঘন্টা নিদ্রাহীন) □আমার ঘুম মাঝারিভাবে বিঘ্নিত হয়(২-৩ ঘন্টা নিদ্রাহীন) □ আমার ঘুম ভীষণভাবে ব্যাহত হয় (৩-৫ ঘন্টা নিদ্রাহীন) □আমার ঘুম সম্পূর্ণরূপে বিঘ্নিত হয় (৫-৭ ঘন্টা নিদ্রাহীন)
৫.১০	ঘাড়ের ব্যথা আপনার বিনোদনমূলক ক্রিয়াকলাপ গুলিকে কিভাবে প্রভাবিত করে?	□আমি কোনও ঘাড় ব্যথা ছাড়াই আমার সমস্ত বিনোদনমূলক ক্রিয়াকলাপে জড়িত থাকতে সক্ষম হয়েছি □ ঘাড়ে কিছুটা ব্যথা নিয়ে আমি আমার সমস্ত বিনোদনমূলক কর্মকাণ্ডে জড়িত থাকতে পারি □ আমি বেশিরভাগই জড়িত হতে পারি, তবে আমার ঘাড়ে ব্যথার কারণে আমার স্বাভাবিক বিনোদনমূলক ক্রিয়াকলাপগুলির সমস্ত নয় □আমার ঘাড়ে ব্যথার কারণে আমি আমার স্বাভাবিক বিনোদনমূলক ক্রিয়াকলাপের কয়েকটি অংশ নিতে সক্ষম □ ঘাড়ে ব্যথার কারণে আমি খুব কমই কোনও বিনোদনমূলক ক্রিয়াকলাপ করতে পারি □আমি কোনো বিনোদনমূলক কাজ করতে পারি না

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

Ref: CRP-BHPI/IRB/12/2024/1031 Date: 15/12/2024

To
Jannatul Ferduse Eti
4th Year B.Sc.in Physiotherapy
Session: 2019-2020, Student ID: 112190505
BHPI, CRP, Savar, Dhaka-1343, Bangladesh.

Subject: Approval of the thesis proposal ''Neck mobility and functioning of patients with chronic neck pain at a selected rehabilitation center in Bangladesh" by ethics committee.

Dear Jannatul Ferduse Eti,
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 Muhammad Millat Hossain, Associate Professor & Course Coordinator, Department of Rehabilitation Science, BHPI, CRP, Savar, Dhaka-1343 as thesis supervisor. The Following documents have been reviewed and approved:

Sl. No.	Name of the Documents
1	Research Proposal
2	Questionnaire (English & Bengali version)
3	Information sheet & consent form.

The purpose of the study is to evaluate the relationship between neck mobility and functional outcomes in patients suffering from chronic neck pain. The study involves use of Goniometer, Neck Disability Index questionnaire, VAS Scale To find out mobility restrictions, pain intensity, and functional limitaton in patient with chronic neck pain that may take 20 to 25 minutes to fill in the questionnaire for collection of specimen and there is no likelihood of any harm to the participants and in the study may benefit the participants or other stakeholders. The members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at **9 AM on 15 JULY, 2024 at BHPI (44th 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 & 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

31th December, 2024

Head

Department of Physiotherapy

Centre for the Rehabilitation of the Paralysed (CRP)

Chapain,Savar,Dhaka-1343

Through: Head, Department of Physiotherapy, BHPI.

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 Jannatul Ferduse Eti, a student of 4th year B.Sc. in physiotherapy at Bangladesh Health Professions Institute (BHPI). The Ethical committee has approved my research project entitled: "Neck Mobility and Functioning of Patient with Chronic Neck Pain at a Selected Rehabilitation Center in Bangladesh" under the supervision of Muhammad Millat Hossain,Associate Professor & Course Coordinator, Department of Rehabilitation Science ,BHPI, CRP, Savar, Dhaka-1343. I want to collect data for my research project from the Department of Physiotherapy at CRP. So, I need permission for data collection from the Musculoskeletal Unit of Physiotherapy Department at CRP-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,

Eti

Jannatul Ferduse Eti

4th Year B.Sc. in Physiotherapy

Class Roll: 24; Session: 2019-20

Bangladesh Health Professions Institute (BHPI)

(An academic Institution of CRP)

CRP-Chapain, Savar, Dhaka-1343.

Recommended & Forwarded

11.01.2025

Muhammad Millat Hossain
Associate Professor
Project & Course Coordinator
Dept. of Rehabilitation Science
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Forwarded

Dr. Shazal Kumar Das, PhD
Assistant Professor and Head
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka-1343.

Approved

Prof. Dr. Mohammad Anwar Hossain, PhD
Professor Physiotherapy Department BHPI
Senior Consultant & Head
Physiotherapy Department
CRP, Savar, Dhaka-1343