Effectiveness of Chiropractic Adjustment for Discogenic Cervical Pain- A Clinical Trial

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Effectiveness of Chiropractic Adjustment for Discogenic Cervical Pain- A Clinical Trial

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

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DECLARATION

This work has not previously been accepted in substance for any degree and isn't concurrently submitted in candidature for any degree. This dissertation is being submitted in partial fulfillment of the requirements for the degree of B.Sc. in Physiotherapy.

I confirm that if anything identified in my work that I have done plagiarism or any form of cheating that will directly awarded me fail and I am subject to disciplinary actions of authority. I confirm that the electronic copy is identical to the bound copy of the Thesis.

In case of dissemination the finding of this project for future publication, research supervisor will highly concern, it will be duly acknowledged as graduate thesis and consent will be taken from the physiotherapy department of SAIC Collage of Medical Science and Technology (SCMST).

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CONTENTS

CHAPTER	CONTENT	PAGE NO.
	Cover page / Title	
	Submission page	
	Declaration	
	Acknowledgement	**i**
	Acronym	**ii**
	List of table	**iii**
	List of figure	**iv**
	Abstract	**v**
Chapter I	**INTRODUCTION**	**1-10**
	1.1 Background	1-3
	1.2 Justification	4
	1.3 Research Hypothesis	5
	1.4 Research Question	6
	1.5 Objective of the study	7
	1.6 Operational Definition	8
	1.7 CONSORT Flow chart	9
	1.8 Conceptual Frame work	10
Chapter II	**LITERATURE REVIEW**	**11-14**
Chapter III	**METHODOLOGY**	**15-19**
	3.1 Study design	15
	3.2 Study area	15
	3.3 Study period	15
	3.4 Study population	15
	3.5 Sample size	15-16
	3.6 Sampling technique	16
	3.7 Inclusion criteria	16

3.8 Exclusion criteria 16
3.9 Method of data collection 16
3.10 Instrument and measurement tools of data collection 17
3.11 procedure of data collection 17
3.11.1 Intervention 17
3.11.2 Treatment protocol 18
3.12 Data management 18
3.13 Analysis of data 18
3.14 Ethical consideration 19
3.15 Limitation 19

Chapter IV RESULT 20-39
Chapter V DISCUSSION 40-42
CONCLUSION AND RECOMMENDATION 43-44
Chapter VI REFERENCE 45-48

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Acronyms

B.Sc.PT	Bachelor of Science in Physiotherapy
BMRC	Bangladesh Medical Research Council
C	Cervical Spine
CDP	Cervical discogenic pain
df	Degree of freedom
DSM	Diagnostic and Statistical of Mental Disorders
Du	Dhaka University
FCR	Flexor carpi radialis
NDI	Neck Disability Index
NPRS	Numeric pain rating scale
ROM	Range of motion
SCMST	Saic College of Medical Science and Technology
SD	Standard deviation
SPSS	Statistical Package for the Social Science
SPSS	Statistical package for the Social Science
TTH	Tension-type headaches
WHO	World Health Organization

List of Tables

Table	Description	Pages
Table 1	Baseline characteristic	20
Table 2	Age of the participant.	21
Table 3	Education level of the participant	24
Table 4	Professional status of the participant	25
Table 5	Monthly income of the participant	27
Table 6	Duration of pain	30
Table 7	If radiate then Where Radiate	31
Table 8	Pain intense according to NPRS of the participant in Experimental group	32
Table 9	Pain intense according to NPRS of the participant in Control group	33
Table 10	Mean pre-test pain between two groups	34
Table 11	Independent sample t test on pre-test Numeric Pain rating Scale between two groups.	34
Table 12	Mean post-test Numeric Pain Rating Scale between two groups.	35
Table 13	Independent sample T-tests on post-test Numeric Pain rating Scale between two groups.	35
Table 14	(paired sample-T test) NPRS in experimental group	36
Table 15	Paired sample-T test in control group	36
Table 16	Mean pre-test NDI between two groups	37
Table 17	Independence sample-T test on pre-test NDI between both groups.	37
Table 18	Mean Post NDI between two groups	38
Table 19	Post-test NDI between two groups (Independent sample-T test).	38
Table 20	Pre-test post-test NDI (Paired-T test) within Experimental group.	39
Table 21	Pre-test post-test NDI (Paired-T test) within Control group	39

List of Figures

Figure	Description	Pages
Figure 1	The Cervical chair technique	14
Figure 2	Chiropractic adjustment for discogenic cervical pain	18
Figure 3	Gender of the participant Experimental group	22
Figure 4	Gender of the participant control group	22
Figure 5	Living area of participant in Experimental group	23
Figure 6	Living area of the participant in control group	23
Figure 7	Marital status of the participant in experimental group	27
Figure 8	Marital status of the participant in control group	27
Figure 9	Cause of pain in Experimental Group	29
Figure 10	Cause of pain in Control Group	29
Figure 11	Is pain radiate to hand in Experimental group	30
Figure 12	Is pain radiate to hand in control group	30

Abstract

Background: Intervertebral disc problem was the cause of cervical discogenic pain, a diverse severe pain disease. The fact that many cases of these disorders do not heal from acute episodes but instead progress to create persistent or recurrent pain is what drives the societal burden of these conditions. Neck pain can develop as a result of acute injury, typically after a car accident, or it can develop gradually over time, as it does in office workers. Various researchers have found that chiropractic treatment is beneficial in various diseases of the spine. ***Objectives:*** To assess the effectiveness of chiropractic adjustment of patient with discogenic cervical pain. ***Method:*** The randomized clinical trial was conducted from July 2022 to June 2023. Neck disability index was use to assess the effectiveness of chiropractic adjustment of patient with discogenic cervical pain. SPSS 25 was used for statistical analysis. ***Result:*** A significant improvement of pain in different position and disability were demonstrated in within group analysis by paired t-test whereas, no significant improvement found in between group analysis by independent sample t-test. ***Conclusion:*** The study found significant change in pain and disability after eight sessions of chiropractic adjustment for discogenic cervical pain. Within-group comparisons showed significant changes on the NPRS scale and neck disability index. Further research is needed to improve evidence-based clinical practice and knowledge.

Key words: *Effectiveness, Chiropractic adjustment, Discogenic cervical pain.*

CHAPTER – I INTRODUCTION

1.1 Background

Intervertebral disc degeneration was the cause of cervical discogenic pain, a diverse severe pain disease. (Eloqayli, 2019). As the largest cause of years spent disabled globally, neck and back discomfort has significant negative health and financial effects. The fact that many cases of these disorders do not heal from acute episodes but instead progress to create persistent or recurrent pain is what drives the societal burden of these conditions. Neck pain can develop as a result of acute injury, typically after a car accident (whiplash associated disorder—WAD), or it can develop gradually over time, as it does in office workers (Sterling, 2019).

Around the world, neck pain was a major public health concern. These had long been believed that cervical intervertebral discs were a major cause of neck problems. Although it had always existed, disc-related pain had never had a precise description, and both its diagnosis and management had generated significant debate. The leading causes of this difficulty might be a lack of knowledge on the origin, casual observation, and poor in-depth study of some clinical studies. (Peng, and DePalma, 2018).

According to estimates, 10% of adults in the general population experience neck pain at some point in life. It is estimated that between 50 and 70 percent of people will experience neck discomfort at some point in their lives, and that as many as 60% of patients still experience chronic pain up to five years after their symptoms first appeared. The second-highest annual workers' compensation costs in the United States are caused by neck pain, which has a major economic effect due to increased visits to healthcare providers, days off from work, and productivity loss (Young, 2014).

With a lifetime prevalence of 26-71% and an annual frequency of 30-50%, neck pain is the second most prevalent musculoskeletal problem worldwide nowadays, after just low back pain (Humphreys, and Peterson., 2013). The C6-C7 and C5-C6 joints are where cartilaginous displacements occur most commonly. They seldom occur at the C2-C3 or C3-C4 joints and are unusual in the C4-C5 or C7-T1 joints. Nucleus pulposus development is rare in older age but is possible in young adulthood. Clinical

observations, the patient's medical history, and the functional examination can all be used to establish diagnoses. Nearly 50% of people report having experienced at least one clinically severe neck discomfort in their lifetime, making it a more typical illness. According to a survey from the United States, cervical discomfort is one of the top 5 causes that contribute to years of incapacity. According to Pakistani data, 62% of goldsmiths in Lahore have neck pain. Also, 51.8% of DPT students are already in Lahore, 78.57% of sewing machine operators are already in Sahiwal, and 72% of computer users are already in Lahore. 10 In India, tertiary care hospital in New Delhi & Uttar Pradesh find a prevalence of 43.3% and 99.2%, respectively, of neck discomfort among office employees. There were 11.3% of Saudi school teachers who reported having neck pain. (Razzaq, et al., 2020).

Chiropractic practic involves curing neck pain with regular intervals. Healthcare providers of chiropractic (DCs) frequently use spinal adjustment, mobilization, device-assisted spinal manipulation, education about modifiable lifestyle factors, exercise modalities, heat/ice, massage, soft tissue therapies like trigger point therapy, as well as strengthening and flexibility exercises when treating patients with neck discomfort. (Bryans et al., 2014). Treatment of leg oedema was actually beyond the scope of chiropractic practice. Following chiropractic adjustment, pain relief in turn promoting ease of mobility and possible sympathetic response accelerating lymphatic return might have help in alleviating leg oedema (Chu, and Wong, 2018).

One of the main illnesses contributing to total impairment in the US was neck pain. Papers had evaluated the clinical and financial viability of various interventional methods for treating persistent neck pain. Even so, there wasn't much information available on using cervical dominated epidural injections to treat persistent neck problems (Manchikanti, et al., 2019).

Chronic pain in the head, neck, shoulder, and upper limbs as well as discomfort that is accompanied by numbness are all symptoms of cervical discogenic pain (CDP), a clinically prevalent pain syndrome brought on by cervical disc degeneration. Patients' quality of life and physical and mental health are significantly impacted by long-term chronic pain. Clinical research has shown that long-term chronic pain sufferers have

impaired sensory, motor, cognitive, memory, and affective processing in their brains (Ma, 2020).

The most significant contribution to the body's control of balance sensing was made by the cervical spine. Sensorimotor dysfunction may occur in neck pain patients. It was thought that excessive strain and micro-trauma result from proprioception impairment, delayed eccentric neck muscular contraction, and inadequate neck stability when executing task. Neck diseases that affect the cervical receptors might disrupt afferent input, which therefore affects the integration and timing of sensorimotor control. Such modifications to sensory control could be related to measurable changes in active cervical ROM, postural stability, cervical joint position awareness, and feelings of dizziness and unsteadiness by neck problem patients (Peng, and DePalma, 2018).

Cervical radicular pain is one of the many manifestations of neck and upper extremity pain, and it frequently necessitates interventional procedures (Manchikanti, 2014).

Mechanical-postural alterations are the main causes of cervical pain. Chiropractic treatment serves as one of the multiple therapeutic modalities employed by physiotherapists in Brazil (Silva, 2012).

1.2 Justification of the study

The investigator aims to determine the effectiveness of chiropractic adjustments to reduce discogenic cervical pain in patients. The purpose of the study would be to find out the effectiveness of chiropractic adjustments in physiotherapy treatment for discogenic cervical patients. Because there is a lack of evidence for this condition, the investigator wanted to find out the effectiveness of chiropractic adjustments for discogenic cervical pain in physiotherapy treatment. Through this research, future treatment plans may improve, and it will give proper guidelines for discogenic cervical pain. This study was also helpful for the physiotherapy profession, and future researchers will get a good idea about this case. So, it will be helpful for delivering treatment to discogenic cervical pain patients.

1.3 Research Hypothesis

1.3.1 Alternative Hypothesis:

Alternative Hypothesis $H_a=\mu_1-\mu_2 \neq 0$ or $\mu_1 \neq \mu_2$.

Cervical chiropractic adjustment was effective for discogenic cervical pain.

1.3.2 Null Hypothesis:

Null Hypothesis $H_0 = \mu_1 - \mu_2 = 0$ or $\mu_1 = \mu_2$.

Cervical chiropractic adjustment was not effective for discogenic cervical pain.

1.4 Research question?

Is chiropractic adjustment effective for discogenic cervical pain?

1.5 Objective of the study

1.5.1 General Objective:

To assess the effectiveness of chiropractic adjustment of patient with discogenic cervical pain.

1.5.2 Specific Objectives:

I. To determine the effectiveness of chiropractic adjustment on disability status of patient with discogenic cervical pain by NDI.

II. To assess level of pain by NPRS.

III. To describe the socio-demographic characteristics of patient with discogenic cervical pain.

1.6 Operational definition:

Pain:

An unpleasant sensory and emotional experience associated with acute or potential tissue damage or describe in terms of such damage.

Cervical pain:

Pain in or around spine when beneath head. Neck is also known as our cervical spine. Neck pain is a common symptom of many different injuries and medical conditions.

Discogenic cervical pain:

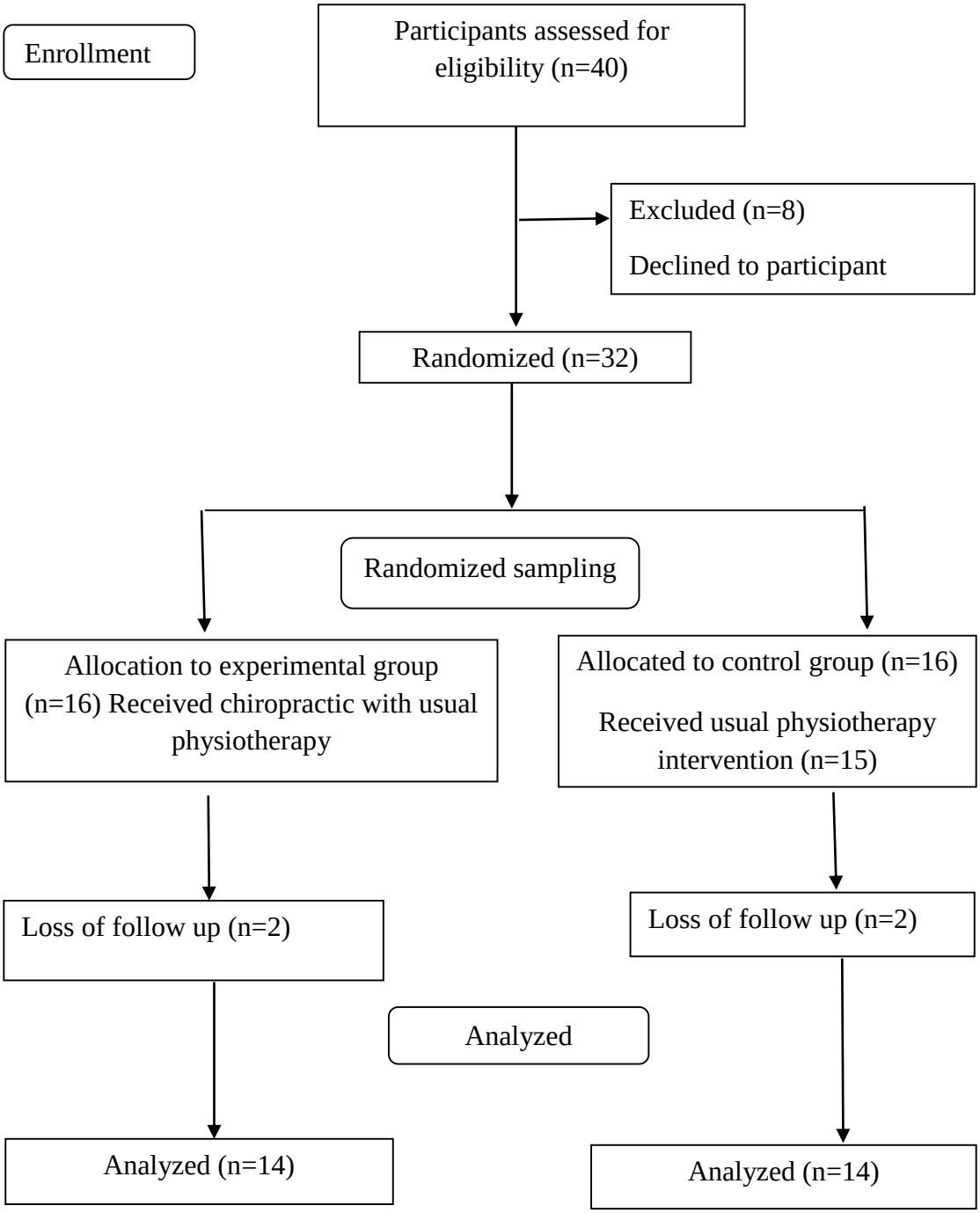
Pain caused by the degeneration of one or more of the discs that are in the first seven vertebrae of the spine (neck).

Chiropractic adjustment:

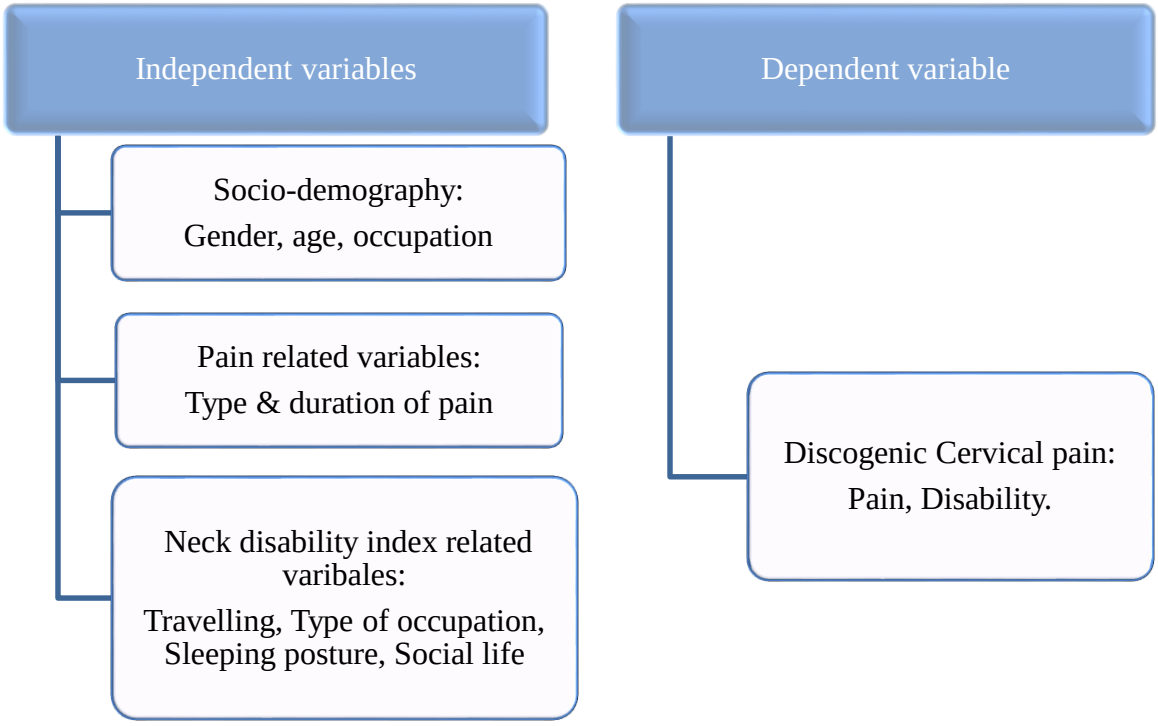
Chiropractic adjustment is a procedure in which trained specialists (chiropractors) use their hands or a small instrument to apply a controlled, sudden force to a spinal joint. Chiropractic is done beyond the physiological limitation but within the anatomical limitation. The goal of this procedure, also known as spinal manipulation, is to improve spinal motion and improve body's physical function.

1.7 CONSORT Flow chart:

Flow chart of the phases of Randomized controlled Trial



1.8 Conceptual frame work:



CHAPTER - II LITEATURE REVIEW

Pain is an unpleasant sensory and emotional experience associated with acute or potential tissue damage or described in terms of such damage or injury part of the body and it is a defense mechanism of the body to produce a consciousness to protect the injury part from other damage (Sikiru and Hanifa, 2010).

A cervical zygapophyseal joint with verified symptoms was present in 35 out of 97 individuals, or 36% (95% CI, 27%-45%). In 83% of patients, the symptomatic segmental level was identified at the initial try using a typical pain diagram (29 of 35). The levels of C3-4 (11/35; 31%) and C5-6 (10/35; 29%) that were most often symptomatic. Although the prevalence of cervical zygapophyseal joint pain in this clinical study was estimated to be lower than that found in prior research setting studies, our estimate is conservative because we required confirmation by a repeat block, which many patients declined to participate in. It is likely that the true prevalence is higher. It is obvious that zygapophyseal joints frequently cause discomfort in individuals who report with persistent neck pain, either with or without headache. It is simple to diagnose discomfort in the cervical zygapophyseal joint, allowing patients to pursue more specialized treatment (Speldewinde, Bashford and Davidson, 2001).

This same exact pathology is complicated and is inconsistently linked to neurogenic, meningeal fragility, cervical spine and temporomandibular joint instability/dysfunction, and cardiovascular dysautonomia. A suspected subclinical cervical spine impairment is given special attention. Standard medical care is always symptomatic and frequently ineffective (Castori, 2015).

Changes in the afferent pathways brought on by central sensitization may allow contact between cervical and temporomandibular nociceptive neurons and the trigeminal nucleus. This gives the pathophysiologic justification for targeting neck or temporomandibular joint treatment to treat primary headaches (Graff-Radford, 2012). Adults frequently experience pain and incapacity due to cervical discogenic discomfort without disc herniation (Manchikanti, 2014).

Any type of pain affects every aspect of a person's life. An essential component of health care is the prevention and treatment of pain. Any pain disorder's development and progression are significantly influenced by psychological variables. Pain is experienced in several anatomical locations in pain disorders. places including the lower back, the neck, the abdomen, and the chest. The real reason for this illness is abnormal signal transmission and processing in the neurological system. Even though data reveals that people with pain disorders are quite common, research currently doesn't adequately address many elements of pain diagnosis and therapy. Different editions of the Diagnostic and Statistical Manual of Mental Disorders (DSM), such as DSM-III, DSM-III revised, DSM-IV, and DSM-IV-textual revisions, have different diagnostic criteria for pain, thus, a more thorough categorization is required right now. A true, trustworthy categorization system and standard nomenclature are necessary for successful communication among academics, doctors, researchers, and patients in order to comprehend and analyze the pathophysiologic process underlying an illness. Once the categorization criteria have been met, an analysis of the criterion's reliability and validity is required. Research efforts may be focused on acquiring a better understanding of the prevalence, etiology, and natural course of a certain condition once the criteria have demonstrated their validity and reliability. This will eventually result in more effective therapy (Kumar, and Elavarasi, 2016).

The clinically prevalent pain condition known as cervical discogenic pain (CDP) is brought on by cervical disk deterioration. Numerous investigations have revealed that CDP causes functional abnormalities in the brain. The precise dynamic brain functioning anomalies in CDP remain unknown, though. In comparison to healthy controls, they discovered that static ALFF was higher in the left insula (INS) and posterior precuneus (PCu) and lower in the left precentral/postcentral gyrus (PreCG/PoCG), thalamus (THA), and subgenual anterior cingulate cortex in CPD patients. In addition, they discovered reduced dynamic ALFF in the right posterior middle temporal gyrus, bilateral THA, and the left PreCG/PoCG. Additionally, they discovered that the visual analog scale and the length of the illness were substantially adversely connected with static ALFF in left PreCG/PoCG and dynamic ALFF in THA, respectively (Ma, 2020).

A total of 216 (101 female) individuals with unilateral lower discogenic CR were randomized to one of three groups in a clinical study with a one-year follow-up. Those in the conventional care group (C) were given the multimodal program (pain management techniques, muscular strengthening and manipulation of the thoracic spine). The typical ventroflexion traction was introduced to the same multimodal program that group C got by the ventroflexion traction group (A). The innovative traction group (B) received a flexor carpi radialis (FCR) H-reflex-based traction technique in addition to the same multimodal program as group C. Neck Disability Index (NDI) was the primary objective, whereas neck pain, arm discomfort, and the amplitude and latency of the H-reflex were the secondary outcomes. Patients were evaluated three times: before therapy, four weeks after treatment, and one year afterwards. The new cervical traction group (B) showed a significant group time effect for measures of NDI (F = 412.6, P b.0005), neck pain (F = 108.9, P b.0005), arm pain (F = 91.3, P b.0005), H- reflex amplitude (F = 207.7, P b.0005), and H-reflex latency (F = 58.9, P b We discovered that the cervical spine's extension position (5° extension) was the position that the innovative cervical traction approach improved the most (Moustafa, and Diab, 2014).

Patients with patellofemoral pain syndrome who went to the Imam Khomeini Hospital Clinic's Sports Medicine Department were a part of a research investigation. Patients' pain levels were assessed using the Numeric Pain Rating Scale (NRPS), and knee joint function was assessed using the process test (Shafiei, et al., 2019).

Daniel David Palmer claimed to have performed a first chiropractic adjustment on September 18, 1895. As the field of chiropractic expanded, more people celebrated Chiropractic Day both domestically and internationally. (Johnson, 2020).

A 44-year-old school teacher who, after receiving chiropractic care, found long-term relief from significant depression and tension-type headaches (TTH). It is generally known that people with unpleasant physical symptoms such a persistent headache, a backache, or joint discomfort frequently have psychiatric comorbidity and a higher risk of suicide. Recent research revealed that the pathophysiology of TTHs and depressive disorders involves autonomic dysfunction. The spinal cord, brain stem, and hypothalamus each include reflex centers that play a major role in controlling the

autonomic nervous system. This study emphasizes the beneficial effects of spinal realignment in several neuropsychiatric illnesses. In this specific situation, the long-term effects of the chiropractic adjustment were excellent. It is necessary to do further research with bigger sample sizes to clearly define the function of chiropractic (Chu, and Ng, 2018).

Figure 1. The Cervical Chair technique (Gregoletto, and Martinez, 2014).

By manipulating the spine to repair a "vertebral subluxation" or a "vertebral subluxation complex" that is thought to be the origin of sickness, chiropractors frequently treat children for a range of disorders. Such therapy could start as soon as the baby is delivered. Children's chiropractic care, which involves subluxation correction as a therapeutic or preventative strategy, is supported by both of the major American chiropractic associations, the International Chiropractic Association and the American Chiropractic Association. Any effort to cure a purported chiropractic subluxation by manipulating the young, cartilaginous spine of a newborn or small kid should be considered risky and useless. It is not advisable to send a child to a chiropractor for this type of treatment in case the outcome is unfavorable and the chiropractor is accused of malpractice or neglect (Homola, 2016).

Chapter- III Methodology

3.1 Study design:

The study was a randomized controlled trial (RCT). RCT is appropriate for the comparison to the effectiveness of spinal manipulation and other conventional physiotherapy for the patients with Discogenic Cervical Pain.

3.2 Study area:

Data collected from the outpatient, musculoskeletal physiotherapy unit of the Physiotherapy department at Saic Physiotherapy and Rehabilitation Service, Pain-paralysis Specialised & General Hospital, Unique Pain and Paralysis Center and Academy of Physiotherapy Pain and Rehabilitation Center.

3.3 Study period:

The duration of the study was 12 months from 1st July 2022 to 30th June 2023.

3.4 Study population:

The population of this study was made up of patients with discogenic cervical pain.

3.5 Sample size:

$$\frac{2SD(\frac{Z\alpha}{2}+Z\beta)^2}{d^2}$$

Here,

From *Z* table at type 1 error of 5%, $\frac{z\alpha}{2} = 1.96$

From *Z* table 80% power $Z\beta$= 0.84

Effect size- difference between mean values, *d*= 3 (Danazumi, et al.,2021).

Standard deviation *SD*=17.2 (En, Clair, and Edmondston, 2009).

Sample size *n*=?

The sample size calculation of clinical trail the following equation-

$$n=\frac{2SD(\frac{Z\alpha}{2}+Z\beta)^2}{d^2}$$

$$=\frac{2\times17.2(1.96+0.84)^2}{3^2}$$

$=\frac{34.4(2.8)^2}{9}$

$=\frac{34.4\times7.84}{9}$

$=\frac{269.696}{9}$

=29.96

=29.96 (10% add)

=32.95

Total sample size *n*= 32

So, the researcher aim was focused his study by sample following the above initially. The researcher was adding a 10% non-response rate along with a non- response rate to the full sample size.

3.6 Sampling technique:

As these patients attained in the sites randomly in a specific period of time without the choice of various chamber authority or the researcher's choice, so that, they may be considered as a random sampling. After screening of 40 participants 32 sample fulfill the eligibility criteria.

Then the 32 participants randomly assigned 16 into experimental and 16 into control group by randomization.

3.7 Inclusion criteria:

Patient confirm diagnosis discogenic cervical pain diagnosed by MRI.

Both male and female.

Age group between 25-60 years old

3.8 Exclusion criteria:

Who were mentally unstable.

Who were not interested.

Pathological problem in cervical origin.

Recent surgery in the cervical region

3.9 Method of data collection:

A self-administered questionnaire was used to collect data from the study participants.

3.10 Instruments and Measurement tools of data collection:

A questionnaire was prepared according to the objectives and variables of the present study. The questionnaire contained both open ended and close ended questions. The questionnaire had three parts. First part contained questions on socio-demographic information (Structural Questionnaire was used for socio-demographic indication). The second part included questions about pain by using Numeric pain rating scale (NPRS). Third part included Neck Disability Index (NDI).

3.11 Procedure of data collection:

Patients were coming in outpatients' services of physiotherapy department of SAIC, UNIQUE, Academy of physiotherapy, Manikganj specialized pain paralysis & generalized hospital then discogenic cervical pain patients were randomized by lottery method. Then pre-test data was collected before treatment and post-test was collected after 8 sessions of the treatment.

3.11.1 Intervention:

The total duration of the trial regimen was two weeks, four sessions per week, and the duration of each session of treatment was 40–45 minutes.

The experimental group participants received chiropractic adjustments along with usual physiotherapy treatment. The usual physiotherapy treatments include McKenzie concept directional treatment procedures according to patients' conditions and basic physiotherapy treatments like cervical mobilization, cervical muscle strengthening and stretching, gentle transverse friction massage, deep transverse friction massage, postural advice, and also home advice. In the control group, participants were given only the usual physiotherapy treatment. Both groups received treatment for eight sessions. Treatment has been given by qualified physiotherapists who were trained in chiropractic for the experimental group. Postural advice and education were given in sitting, standing, and lying positions to both group participants.

3.11.2 Treatment protocol:

Chiropractic adjustments, along with other interventions, was given by trained and qualified physiotherapists in the experimental group. In the control group, participants were given only the usual physiotherapy treatment.

Treatment protocol	
Experimental group (40-45 min) Chiropractic adjustment (One thrust movement per segment on every session) along with Usual Physiotherapy intervention.	**Control group (40-45 min)** (Usual Physiotherapy intervention) • McKenzie Approach (Directional Preference) 1 set 10 rep performed. • Soft tissue technique (10 minutes). • Ice compression (15 minutes). • Education about posture and home exercises.

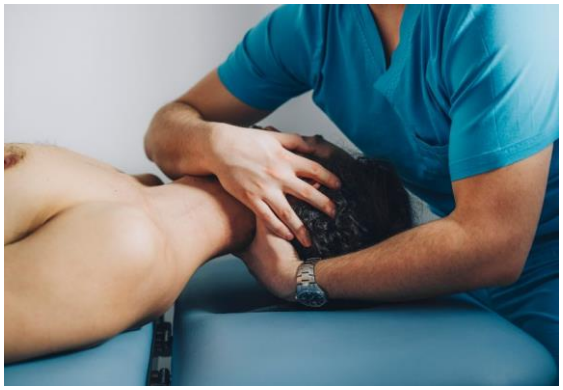


Figure 2: Chiropractic adjustment for discogenic cervical pain.

3.12 Data management:

At the end of each day the collected questionnaires were cheeked for any error or inconsistency. Necessary corrections were made. The recorded data were coded accordingly into the SPSS-25 version program.

3.13 Data analysis:

Data was analysis by SPSS version 25 using for descriptive analysis for socio-demography variable, test- paired t-test & independent t-test. Excel version 2019.

3.14 Ethical consideration:

The investigator Followed the World Health Organization (WHO) & Bangladesh Medical Research Council (BMRC) guidelines.

Approval received from the ERB of SCMST.

Data collection permission was taken from the Head of the Physiotherapy Department of SCMST.

Confidentiality maintained strictly.

Informed consent was taken from every participant.

3.15 Limitation:

The main limitation of this study was its shortened duration.

This study was performed on a small sample. So, generalization of the results is not possible.

So, there might be some limitations to this study.

This research is part of my academic study, and I am not an expert on statistical analysis.

So, there might be a poor analysis.

CHAPTER - IV RESULT

4.1 Baseline characteristics:

Table no: 1 Baseline characteristics of the participant.

Variable	Control group (n=14)	Experimental group (n=14)
Mean age ±SD	42.07 ± 8.435	42.29 ± 11.351
Less than 31 years	1(7.10%)	3(21.40%)
31-40 years	6(42.90%)	3(21.40%)
41-50 years	4(28.60%)	3(21.40%)
More than 51 years	3(21.40%)	5(35.70%)
Gender		
Male	7 (50%)	9 (64.30%)
Female	7 (50%)	5(35.70%)
Marital status		
Married	13 (92.90%)	11 (78.60%)
Unmarried	1 (7.10%)	3 (21.40%)
Living area		
Urban	10 (71.40%)	14 (92.90%)
Semi urban	1 (7.10%)	0
Rural	3 (21.40%)	1 (7.10%)
Duration of pain		
More than a year	9 (64.30%)	12 (85.70%)
Months	3 (21.40%)	2 (14.30%)
Weeks	2 (14.30%)	
Pain intensity paired sample test		
Mean ± SD	4.357±1.823	4.714±0.597
NDI paired sample test		
Mean ± SD	13.789±6.216	14.357±8.635

The above-mentioned table-1 shows the base line characteristics of experimental and control group which revealed their frequency, mean value with standard deviations [Table no. 1].

The objective of the present study was to assess the Effectiveness of Chiropractic adjustment for discogenic cervical pain. Data were collected through face-to-face interview with participants using a pretested questionnaire NPRS and NDI questionnaire for pain and disability measurement. The data was analyzed by Microsoft Office Excel 2019 with SPSS 25 version software program. In this study the researcher used frequency table, figure and description of the variables to present the result of the study.

4.2 Socio-demographic variable

4.2.1 Age of the participant

Table 2: Age of the participants

Age group in years	**Experimental group**		**Control group**	
	Frequency		Frequency	
	N	%	N	%
Less than 31 years	3	21.40	1	7.10
31-40 years	3	21.40	6	42.90
41-50 years	3	21.40	4	28.60
>51 years	5	35.70	3	21.40
Total	14	100	14	100
Mean±SD	42.29 ± 11.351		42.07 ± 8.435	

Regarding the frequency distribution of the respondents by age, in the experimental group, it was found that 5 (35.70%) belong to the more than 51 age group. It was also found that 3 (21.40%) respondents were in the age group of 41-50 age group. The mean age of the experimental group was 42.29 and the standard deviation was 11.351, while in the control group, 6 (42.90%) respondents belonged to the age group 31–40, and 4 (28.60%) respondents were in the age group 41–50. The mean age of the control group was 42.07 and the standard deviation was 8.435 [Table no. 2].

4.2.2 Gender of the participant

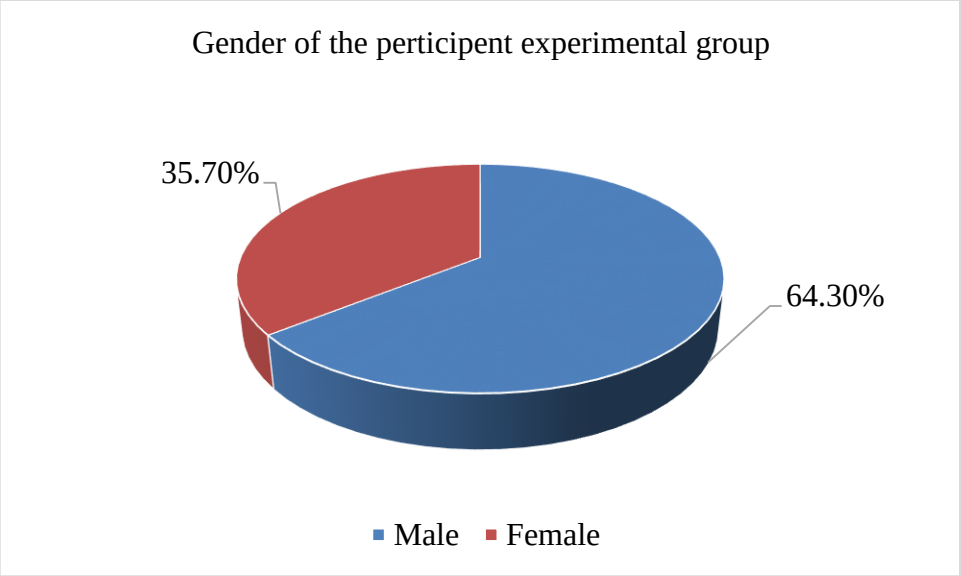


Figure No 3: Gender of the participant in Experimental group

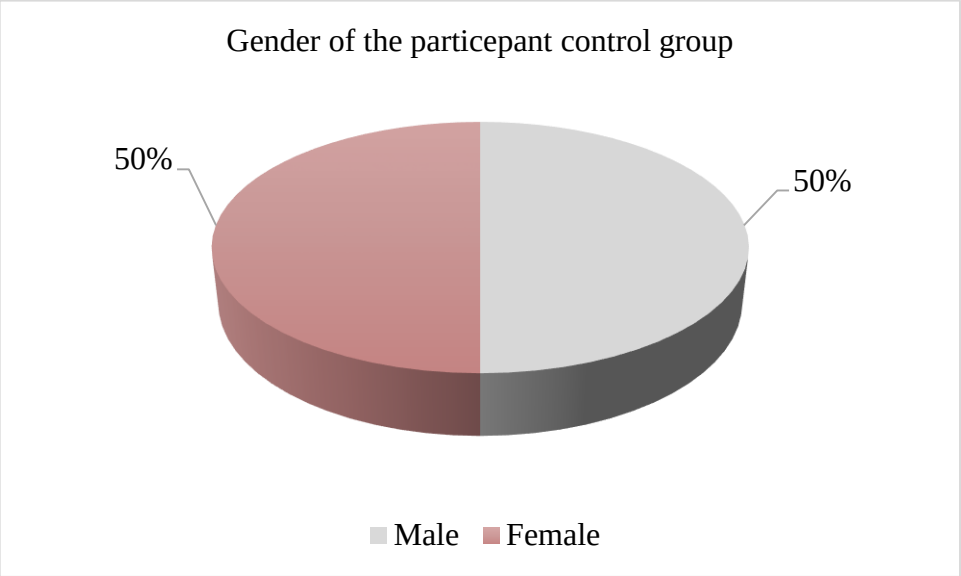


Figure No 4: Gender of the participant in Control group

In this study we reveal that the gender of the participants in the Experimental group, there were 9 male and 5 female patients. The percent of male in the experimental group was 64.30% and females 35.70%. In the control group was 7 males and 7 females. Males made up 50% of the control group, while females made up 50% [Figure no.3 and 4].

4.2.3 Living area of the participant

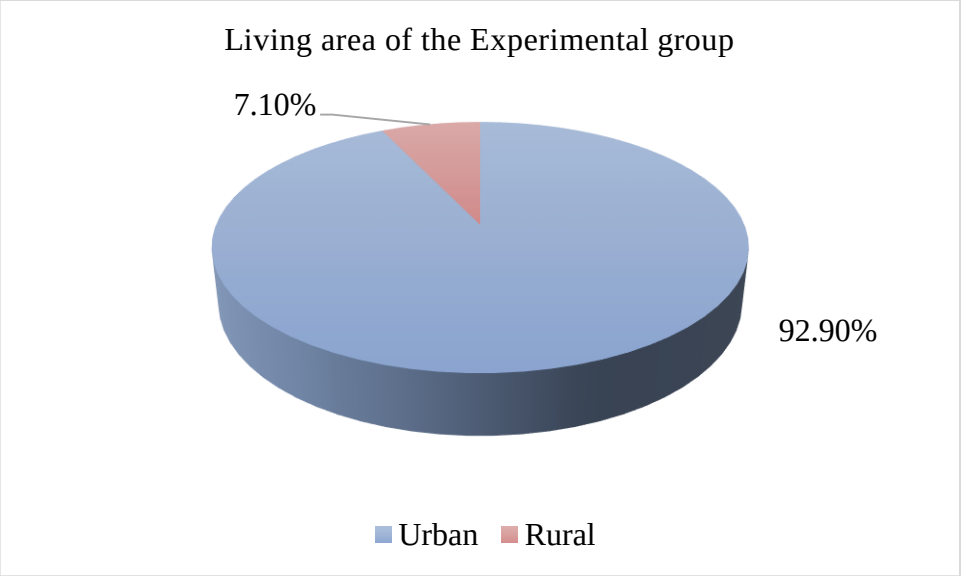


Figure No 5: Living area of the participant in Experimental group

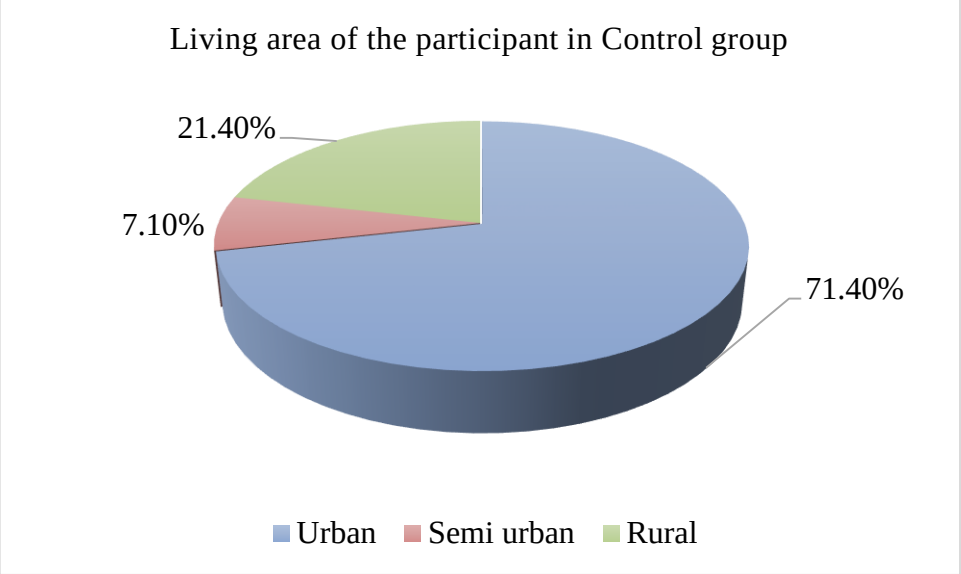


Figure No 6: Living area of the participant in Control group

This study found that living area of the participant. The experimental group was urban 14 (92.90%) and rural 1 (7.10%). The control group was urban 10 (71.40%), semi urban 1 (7.10%) and rural 3 (21.40%) [Figure no.5 and 6].

4.2.4 Education level of the participant

Table 3: Education level of the participants

Education level	**Experimental group**		**Control group**	
	Frequency		Frequency	
	N	%	N	%
Primary	1	7.10	2	14.30
S.S.C.	1	7.10	4	28.60
H.S.C.	3	21.40	1	7.10
Graduation	5	35.70	6	42.90
Others	4	28.60	1	7.10
Total	14	100	14	100

This study showed that the Education level of the participants, in experimental group Primary 1 (7.10%), S.S.C. 1 (7.10%), H.S.C. 3 (21.40%), Graduation 5 (35.70%), Others 4 (28.60%). On the other hand, in control group Primary 2 (14.30%), S.S.C. 4 (28.60%), H.S.C. 1 (7.10%), Graduation 6 (42.90%), Others 1 (7.10%) [Table no.3].

4.2.5 Professional status of the participant

Table 4: Professional status of the participants

Profession Of the participants	**Experimental group**		**Control group**	
	Frequency		Frequency	
	N	%	N	%
Teacher	1	7.10	0	0.00
Service holder	7	50.00	6	42.90
House wife	3	21.40	4	28.60
Businessman	1	7.10	2	14.30
Others	2	14.30	2	14.30
Total	14	100	14	100

This study showed the Professional status of the participant, The experimental group was Service holder 7 (50.00%), House wife 3 (21.40%), Others 2 (14.30%), Businessman 1 (7.10%), Teacher 1 (7.10%). In control group Service holder 6 (42.90%), House wife 4 (28.60%), Businessman 2 (14.30%), Others 2 (14.30%) [Table no.4].

4.2.6 Monthly income of the participant

Table 5: Monthly income of the participants

Monthly income Frequency	**Experimental group**		**Control group**	
	Frequency		Frequency	
	N	%	N	%
< 25000 BDT	7	50.00	13	92.90
25000-50000 BDT	5	35.70	1	7.10
50001-75000 BDT	1	7.10	0	0.00
>75000 BDT	1	7.10	0	0.00
Total	14	100	14	100
Mean±SD	31071.43 ± 30708.216		11071.43 ± 10950.689	

The study revealed that the Monthly income of the participant, In experimental Group the value <25000 BDT 7 (50.00%), 25000-50000 BDT 5 (35.70%), 50001-75000 BDT 1 (7.10%), >75000 BDT 1 (7.10%). In Control Group the value <25000 BDT 13 (92.90%), 25000-50000 BDT 1 (7.10%). The Mean income in experimental group was 31070.43 BDT and the Standard deviation was 30708.216. The Mean income in control group was 11071.43 BDT and the Standard deviation was 10950.689 [Table no.5].

4.2.7 Marital status of the participant

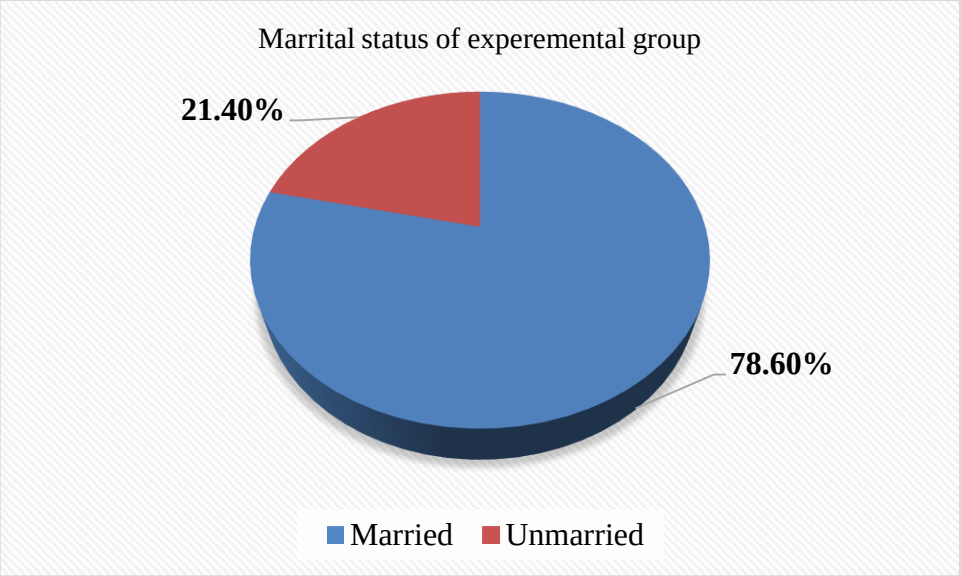


Figure No 7: Marital status of the participant in Experimental group

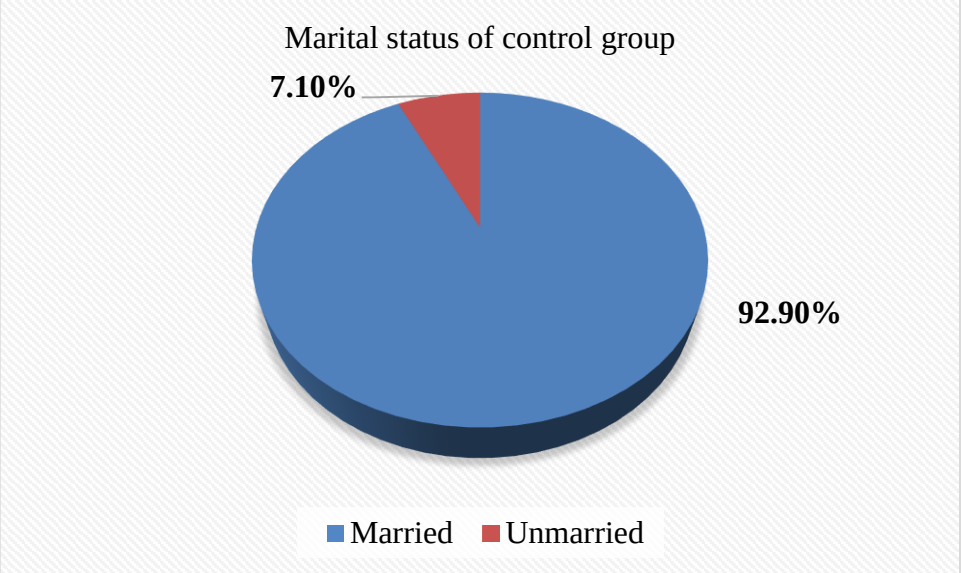


Figure No 8: Marital status of the participant in control group

In this study, found the marital status of the participant. The experimental group was Married 11 (78.60%) and Unmarried 3 (21.40%). On other hand, the control group was Married 13 (92.90%) and Unmarried 1(7.10%) [Figure no.7 and 8].

4.3.1 Duration of pain

Table 6: Duration of pain

Duration of pain Frequency	**Experimental group**		**Control group**	
	Frequency		Frequency	
	N	%	N	%
More than a year	9	64.30	12	85.70
Months	3	21.40	2	14.30
Weeks	2	14.30	0	0.00
Total	14	100	14	100

The study revealed that the Duration of pain of the participant, In Experimental group More than a year 9 (64.30%), Months 3 (21.40%) and Weeks 2 (14.30%). In Control group More than a year 12 (85.70%) and Months 2 (14.30%) [Table no.6].

4.3.2 Cause of pain

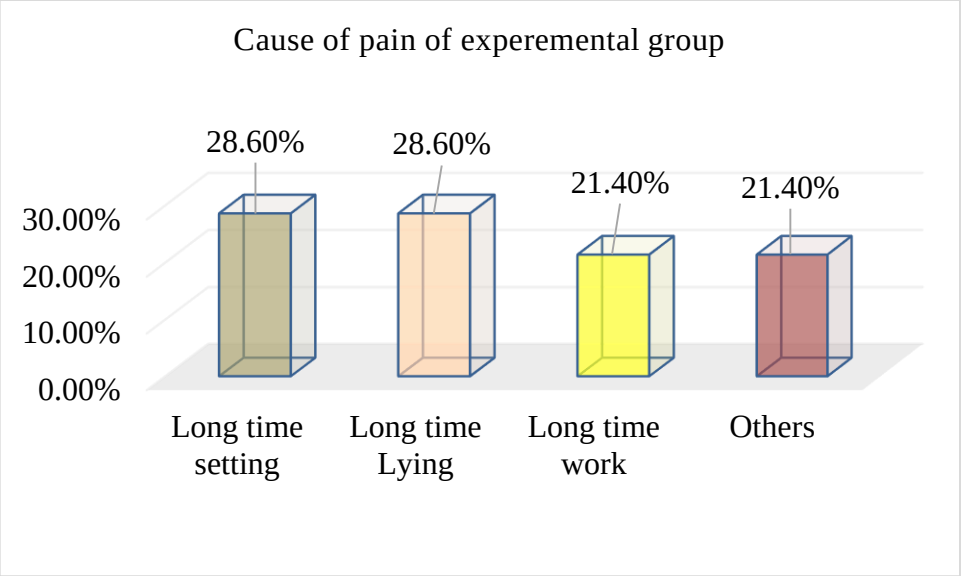


Figure No 9: Cause of pain in Experimental Group

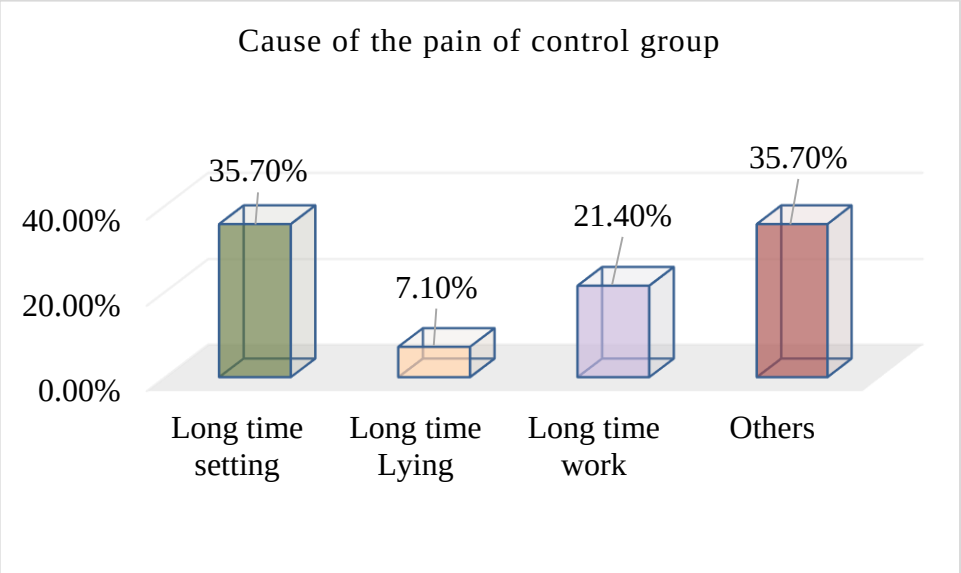


Figure No 10: Cause of pain in Control Group

In this study, shows that the cause of pain. In experimental group long time setting 4 (28.60%), long time lying 4 (28.60%) long time work 3 (21.40%) and others is 3 (21.40%). In control group long time setting 5 (35.70%), long time lying 1 (7.10%) long time work 3 (21.40%) and others is 5 (35.70%) [Figure no.9 and 10].

4.3.3 Is pain radiate to hand

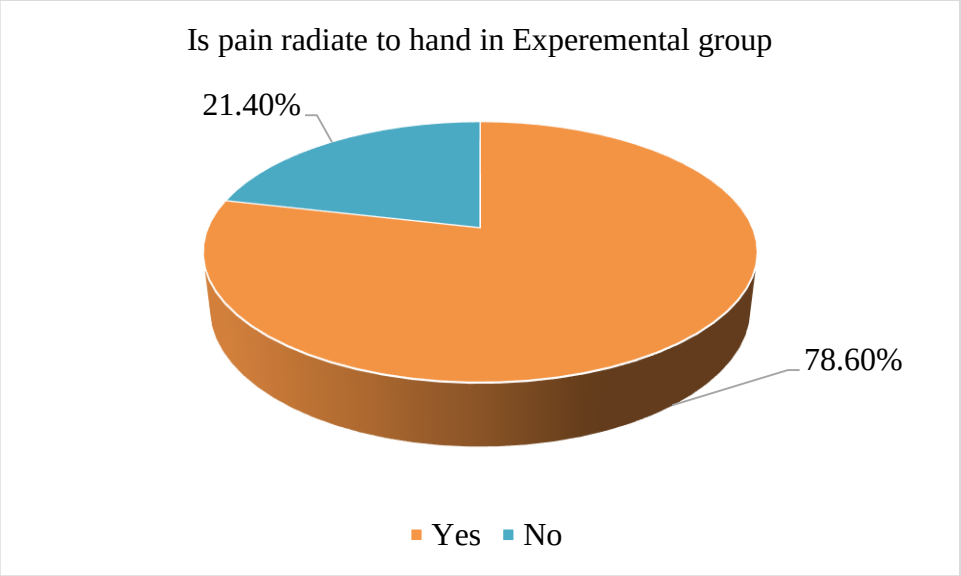


Figure No 11: Is pain radiate to hand in Experimental group

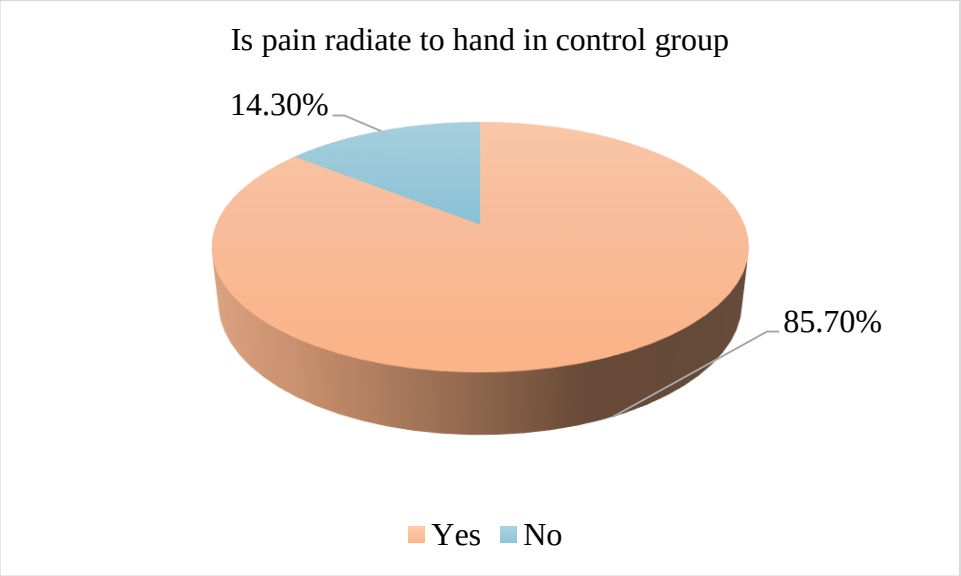


Figure No 12: Is pain radiate to hand in control group

In this study it revealed that, is the pain radiate to hand of the participant. the experimental group said Yes 11 (78.60%) and No 3 (21.40%). On other hand, the control group said Yes 12 (85.70%) and No 2 (14.30%) [Figure no.11 and 12].

4.3.4 Where Radiate

Table 7: If radiate then Where Radiate.

Where radiate Frequency	**Experimental group**		**Control group**	
	Frequency		Frequency	
	N	%	N	%
Unilateral above elbow	2	14.30	6	42.90
Unilateral below elbow	7	50.00	2	14.30
Bilateral above elbow	0	0.00	3	21.40
Bilateral below elbow	2	14.30	1	7.10
No	3	21.40	2	14.30
Total	14	100	14	100

This study found that, if radiate then Where Radiate of the participant, In Experimental group Unilateral above elbow 2 (1 1 4.30%), Unilateral below elbow 7 (50.00%), Bilateral below elbow 2 (14.30%) and no 3 (21.40%). In Control group More than a year 12 (85.70%) and Months 2 (14.30%) [Table no.7].

4.3.5 Pain intense according to NPRS of the participant

Table 8: Pain intense according to NPRS of the participant in Experimental group

Value **Frequency**	**Pre-test**		**Post-test**	
	Frequency		Frequency	
	N	%	N	%
Mild pain	2	14.30%	13	92.90%
Moderate pain	6	42.90%	1	7.10%
Severe pain	6	42.90%	0	0%
Total	14	100%	14	100%
Mean± SD	6.07 ± 2.165		1.36 ± 1.216	

In Experimental group, NPRS pre-test mean was 6.07 and post-test mean was 1.36. Here found the mean difference between pre-test and post-test was 4.71. On the period of pre-test patient feels Mild pain 2 (14.30%), Moderate pain 6 (42.90%), Severe pain 6 (42.90%) and standard deviation was 2.165. On the period of post-test patient feels Mild pain 13 (92.90%), Moderate pain 1 (7.10%) and standard deviation was 1.216 [Table no.8].

Table 9: Pain intense according to NPRS of the participant in control group

Value Frequency	**Pre-test**		**Post-test**	
	Frequency		Frequency	
	N	%	N	%
Mild pain	1	7.10	12	85.70
Moderate pain	5	35.70	2	14.30
Severe pain	8	57.10	0	0
Total	14	100	14	100
Mean± SD	6.79 ± 2.119		2.43 ± 1.016	

In Control Group, NPRS pre-test mean was 6.79 and post-test mean was 2.43. Here found the mean difference between pre-test and post-test was 4.36. On the period of pre-test patient Mild pain 1 (7.10%), Moderate pain 5 (35.70%), Severe pain 8 (57.10%) and standard deviation was 2.119. On the period of post-test patient Mild pain 12 (85.70%), Moderate pain 2 (14.30%) and standard deviation was 1.016 [Table no.9].

4.4 Between group Numeric pain rating scale:

4.4.1 Pre-test NPRS between two groups

Table 10: Mean pre-test pain between two groups.

Group of study	Sample	Mean± SD
Experimental	14	6.07±2.165
Control	14	6.79±2.119

Table 11: Independent sample t-test on pre-test Numeric Pain rating Scale between two groups.

Variables	t	df	95% CI		Sig value, (p)
			Lower	Upper	
NPRS	.882	26	-.950	2.378	.386

Level of significance (<0.05)

In experimental group mean pre-test overall NPRS was 6.07±2.165 and control group mean pre-test overall pain was 6.77±2.119. Independent sample-t test has been determined to measure the differences of pre-test numeric pain rating scale between control and experimental groups. There are no significant differences found on pre-test numeric pain rating scale because the level of significant is (<0.05) [Table no.10 and 11].

4.4.2 Post-test Numeric Pain Rating Scale between two groups

Table 12: Mean post-test Numeric Pain Rating Scale between two groups.

Group of study	Sample	Mean± SD
Experimental	14	1.36±1.216
Control	14	2.43±1.016

Table no 13: Independent sample t-tests on post-test Numeric Pain rating Scale between two groups.

Variables	t	df	95% CI		Sig value, (p)
			Lower	Upper	
NPRS	2.530	26	.201	1.942	.018

Level of significance (<0.05)

In experimental group mean post-test overall NPRS was 1.36±.1.216and control group mean post-test overall pain was 2.43±1.016. Independent sample-t test has been determined to measure the differences of post-test numeric pain rating scale between control and experimental groups. There are no significant differences found on post-test numeric pain rating scale because the level of significant is (<0.05) [Table no.12 and 13].

4.5 Within group Numeric Pain Rating Scale

4.5.1 Pre-test post-test NPRS in Experimental group and Control group

Table no 14: (Paired sample t-test) NPRS in experimental group.

Variables	95% CI		t	df	Sig value, (p)
	Lower	Upper			
NPRS	3.425	6.004	7.897	13	.001

Level of significance (<0.05)

Table no 15: Paired sample t-test in control group.

Variables	95% CI		t	df	Sig value, (p)
	Lower	Upper			
NPRS	3.304	5.410	8.942	13	.001

Level of significance (<0.05)

Paired sample t test has been determined to measure the changes in NPRS between pre-test and post-test of NPRS followed by UPT intervention in control group. In experimental group t-value 7.897, df 13, p .001, and control group t-value 8.942, df 13, p .001 that means the null hypothesis has been accepted and alternative hypothesis has been rejected. Chiropractic intervention has no significant effect on pain for the patients with discogenic cervical pain [Table no. 14 and 15].

4.6 Between Group Disability Statuses

4.6.1 Pre-test Neck Disability Index between two groups (Independence sample t-test)

Table no 16: Mean pre-test NDI between two groups.

Group of study	Sample	Mean± SD
Experimental	14	19.00±10.842
Control	14	22.21±11.564

Table no 17: Independence sample t-test on pre-test NDI between both groups.

Variables	t	df	95%CI		Sig value, (P)
			Lower	Upper	
NDI	.759	26	-5.494	11.922	.455

Level of significance (<0.05)

Pre-test mean NDI in experimental group was 19.00±10.842 and control group was 22.21±11.564. The t value was .759 df 26 and the significant value was (.455). The test has no significant effect result according to statistical test revealing change between pre-test of control and experimental group in NDI score [Table no.16 and 17].

4.6.2 Post NDI between two groups

Table no 18: Mean Post NDI between two groups.

Group of study	Sample	Mean± SD
Experimental	14	4.64 ± 3.734
Control	14	8.43±5.996

Table no 19: Post-test NDI between two groups (Independent sample t-test).

Variables	t	df	95%CI		Sig value, (P)
			Lower	Upper	
NDI	2.005	26	-.095	7.666	.040

level of significance (<0.05)

Post-test mean NDI in experimental group was 4.64±3.734 and control group was 8.43±5.996. The test has no significant result according to statistical test revealing changes between post-test of control and experimental group in NDI score, t 2.005, df 26, p value .040. That means the alternative hypothesis has been accepted and null hypothesis has been rejected. Chiropractic intervention has a no significant 0.040 on disability remission for the Discogenic cervical pain patient treated by Chiropractic Adjustment [Table no. 18 and 19].

4.6.3 Pre-test Post-test NDI within Experimental group and control groups (Paired sample t test)

Table no 20: Pre-test post-test NDI (Paired t-test) within Experimental group.

Variables	95%CI		t	df	Sig value, (P)
	Lower	Upper			
NDI	9.372	19.343	6.221	13	.001

level of significance (<0.05)

Table no 21: Pre-test post-test NDI (Paired t-test) within Control group.

Variables	95%CI		t	df	Sig value, (P)
	Lower	Upper			
NDI	10.197	17.375	8.298	13	.001

level of significance (<0.05)

Paired sample t-test has been determined to measure the changes in NDI score between pre-test and post-test of NDI followed by Chiropractic Adjustment in experimental group. In experimental group t-value 6.221, p .001 and control group t-value 8.298, p .001, that means the null hypothesis has been accepted and alternative hypothesis accepted. Chiropractic intervention has no significant effect on reduction of disability score for the patients with Discogenic cervical pain [Table no. 20 and 21].

CHAPTER-V DISSCUSSION

The purpose of the study was to find out the Effectiveness of Chiropractic adjustments for Discogenic Cervical Pain. The result of the study revealed that pain and disability status significantly improved in both groups, while between-group analysis showed no significant changes. However, the baseline characteristics of all the subjects were similar in both the experimental and control groups.

Moustafa, and Diab, (2014) in their research found mean ± SD age in their research it was 40.2 ± 4.9. In this study, experimental group < 31 years n=3 (21.40%), 31-40 years n= 3 (21.40%), 41-50 years n= 3 (21.40%), >51 years n=5 (35.70%) and control group < 31 years n=1 (7.10%), 31-40 years n= 6 (42.90%), 41-50 years n= 4 (28.60%), >51 years n=3 (21.40%). The mean age of the Experimental group was (42.29 years) with a standard deviation of (11.351 years), while the mean age of the control group was (42.07 years) with a standard deviation of (8.435 years).

Genebra, et al., (2017) found 100 male and 100 female in their research. This study found that the Gender of the participant, the control group was 7 male and 7 female patients. The percent of the control group was male 50% and female 50%. In the Experimental group was 9 male and 5 female patients. The percent of the experimental group was male 64.30% and female 35.70%.

This revealed that living area of the participant. The control group was urban n= 10 (71.40%), semi urban n= 1 (7.10%) and rural n= 3 (21.40%). The experimental group was urban n= 14 (92.90%) and rural n=1 (7.10%).

Study found that the Education level of the participants, in experimental group Primary n=1 (7.10%), S.S.C. n=1 (7.10%), H.S.C. n= 3 (21.40%), Graduation n= 5 (35.70%), Others n= 4 (28.60%). On the other hand, in control group Primary n=2 (14.30%), S.S.C. n=4 (28.60%), H.S.C. n= 1 (7.10%), Graduation n= 6 (42.90%), Others n= 1 (7.10%).

This study reviled the Professional status of the participant, In control group Teacher n= 1 (7.10%), Service holder n= 7 (50.00%), House wife n= 3 (21.40%), Businessman n=1 (7.10%), Others n=2 (14.30%). The experimental group was Service holder n= 6 (42.90%), House wife n= 4 (28.60%), Businessman n= 2 (14.30%), Others n=2 (14.30%).

This study found the Monthly income of the participant, In experimental Group the value <25000 BDT n= 7 (50.00%), 25000-50000 BDT n= 5 (35.70%), 50001-75000 BDT n= 1 (7.10%), >75000 BDT n=1 (7.10%). The Mean income was 31070.43 BDT and the Standard deviation was SD± 30708.216. In Control Group the value <25000 BDT n= 13 (92.90%), 25000-50000 BDT n= 1 (7.10%). The Mean income was 11071.43 BDT and the Standard deviation was SD± 10950.689.

This study found the marital status of the participant. The control group was Married n= 13 (92.90%) and Unmarried n= 1(7.10%) On other hand, the experimental group was Married n= 11 (78.60%) and Unmarried n=3 (21.40%).

This study showed that the Duration of pain of the participant, In Experimental group More than a year n= 9 (64.30%), Months n= 3 (21.40%) and Weeks n= 2 (14.30%). In Control group More than a year n= 12 (85.70%) and Months n= 2 (14.30%).

Study found that the cause of pain, in control group long time setting n=5 (35.70%), long time lying n=1 (7.10%) long time work n=3 (21.40%) and others is n=5 (35.70%). in experimental group long time setting n=4 (28.60%), long time lying n=4 (28.60%) long time work n=3 (21.40%) and others is n=3 (21.40%).

Murphy, et al., (2012) said that given that the Neck Disability Index (NDI) is the most commonly used outcome measure of self-rated disability due to non-specific mechanical neck pain, use in a specific cause of neck pain (such as CR) should be evaluated. They found a mean Numerical Pain Rating Scale (NPRS) score of 6.4 points (2–10, SD 2.4).

In this research, experimental group mean pre-test overall NPRS was 6.07±2.165 and control group mean pre-test overall pain was 6.77±2.119. Independent sample-t test has been determined to measure the differences of pre-test numeric pain rating scale between control and experimental groups. There are no significant differences found on pre-test numeric pain rating scale because the level of significant is (<0.05).

Here I found, Paired sample t test has been determined to measure the changes in NPRS between pre-test and post-test of NPRS followed by UPT intervention in control group. In experimental group t-value =7.897, df =13, p= .001, and control group t-value =8.942, df = 13, p= .001 that means the null hypothesis has been accepted and alternative hypothesis has been rejected. Chiropractic intervention has no significant effect on pain for the patients with discogenic cervical pain.

After analysis Pre-test mean NDI in experimental group was 19.00±10.842 and control group was 22.21±11.564. The t value was .759 df 26 and the significant value was (.455). The test has no significant effect result according to statistical test revealing change between pre-test of control and experimental group in NDI score.

After analysis Post-test mean NDI in experimental group was 4.64±3.734 and control group was 8.43±5.996. The test has significant result according to statistical test revealing changes between post-test of control and experimental group in NDI score, t= 2.005, df = 26, p value = (.040). That means the alternative hypothesis has been accepted and null hypothesis has been rejected. Chiropractic intervention has significant (0.040) on disability remission for the Discogenic cervical pain patient treated by Chiropractic Adjustment.

Pennings, et al., (2020) found NDI%=17.321+2.543 in their research. In this research Paired sample t test has been determined to measure the changes in NDI score between pre-test and post-test of NDI followed by Chiropractic Adjustment in experimental group. In experimental group t-value =6.221, p= .001 and control group t-value =8.298, p= .001, that means the null hypothesis has been accepted and alternative hypothesis accepted. Chiropractic intervention has no significant effect on reduction of disability score for the patients with Discogenic cervical pain.

CHAPER - VI CONCULATION AND RECOMONDATION

CONCLUSION

The result of this study revealed that chiropractic adjustment, along with usual physiotherapy intervention, had significant effect on pain and disability after eight sessions of treatment for patients with discogenic cervical pain. Considering the assessment, the pain in different positions reduced in both groups compared to the initial assessment, and also between-group comparisons showed significant difference. Initial and after eight sessions of intervention, the between-group comparisons found significant change on the NPRS scale and Neck disability index, within-group comparisons found significant change on the NPRS scale and Neck disability index. Chiropractic adjustment is a newly developed treatment approach where the therapist can give manipulation to a specific disc. So, further study is needed to improve evidence-based clinical practice as well as knowledge and skill.

RECOMMENDATION:

So, the investigator recommended some further steps for future research, which include: different musculoskeletal problems with different measurement tools need to be included in future studies; assess range of motion (ROM) and the psychological state of the participants; similar studies with a large sample size and a follow-up session need to be involved in future studies. A study regarding the specific Chiropractic adjustment techniques with specific doses and a financial analysis need to be included. Further study should be done on more specific treatment or placebo treatment in the control group compared with Chiropractic adjustment to find out the Effectiveness of Chiropractic Adjustment for Discogenic Cervical Pain.

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Peng, B., and DePalma, M.J., 2018. Cervical disc degeneration and neck pain. *Journal of pain research*, *11*, p.2853.

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Appendix - A

Institutional Review Board (IRB) Permission Letter

SAIC COLLEGE OF MEDICAL SCIENCE AND TECHNOLOGY
Approved by Ministry of Health and Family Welfare
Affiliated with Dhaka University

Ref : *Date :* .....

Ref.No: *SCMST/PT/ERB-2017-18/1-2023/44*

3rd January'2023

To

Rasel Ahmed

4th Professional B.Sc. in Physiotherapy

Saic College of Medical Science and Technology (SCMST)

Mirpur-14, Dhaka-1216.

Sub: Permission to collect data

Dear Ahmed,

Ethical review board (ERB) of SCMST pleased to inform you that your proposal has been reviewed by ERB of SCMST and we are giving you the permission to conduct study entitled "Effectiveness of chiropractic adjustment to reduce discogenic cervical pain" and for successful completion of this study you can start data collection from now.

Wishing you all the best.

Thanking You,

11.01.'23

Head of ERB
Ethical Review Board
Saic College of Medical Science and Technology

11.01.23

Principal
Saic College of Medical Science and Technology
Mirpur-14, Dhaka-1216

Address: Saic Tower, M-1/6, Mirpur-14, Dhaka-1216.Mobile:01936005804
E-mail: simt140@gmail.com, Web:www.saicmedical.edu.bd

Appendix - B

Permission letter for data collection

SAIC COLLEGE OF MEDICAL SCIENCE AND TECHNOLOGY

Approved by Ministry of Health and Family Welfare
Affiliated with Dhaka University

Ref : *Date : .....*

Ref.No: *SCMST/PT/ERB-2017-18/1-2023/44(b)*

7th February'2023

To

Managing Director

Pain-paralysis Specialised & General Hospital

36/1, Shahid Soroni Road, Manikgang-1800

Sub: Permission to collect data

Dear Ahmed,

Ethical review board (ERB) of SCMST pleased to inform you that your proposal has been reviewed by ERB of SCMST and we are giving you the permission to conduct study entitled "Effectiveness of chiropractic adjustment to reduce discogenic cervical pain" and for successful completion of this study you can start data collection from now.

Wishing you all the best.

Thanking You,

Head of ERB
Ethical Review Board
Saic College of Medical Science and Technology

09.02.23
Principal
Saic College of Medical Science and Technology
Mirpur-14, Dhaka-1216

Approved for Data Collection
12/02/2023
Dr. Md. Shahidul Islam
Senior Consultant & Managing Director
Pain-Paralysis Specialised & General Hospital

Ref.No: *SCMST/PT/ERB-2017-18/1-2023/44*

Address: Saic Tower, M-1/6, Mirpur-14, Dhaka-1206. Mobile: 01936005804
E-mail: simt140@gmail.com, Web:www.saicmedical.edu.bd

SAIC COLLEGE OF MEDICAL SCIENCE AND TECHNOLOGY
Approved by Ministry of Health and Family Welfare
Affiliated with Dhaka University

Ref.No: *SCMST/PT/ERB-2017-18/1-2023/44* Date : ....

1st February'2023

To

The Chairman

Unique Pain and Paralysis Centre

Mirpur-11, Dhaka-1216.

Sub: Permission to collect data.

Dear Sir/Mam,

Ethical review board (ERB) of SCMST pleased to inform you that Rasel Ahmed of final year B.Sc. in Physiotherapy student from Saic College of Medical Science and Technology doing a thesis entitle of "Effectiveness of chiropractic adjustment to reduce discogenic cervical pain" which has been reviewed by ERB of SCMST and we are giving permission to him to conduct this study. His data collection area is within Dhaka, so he wants to take data from your department.

I hope you will give kind permission to collect data to complete his study successfully and oblige thereby.

Thanking You,

1.02.'23

Head of ERB

Ethical Review Board

Saic College of Medical Science and Technology

01.02.23

Principal

Saic College of Medical Science and Technology

Mirpur-14, Dhaka-1216

Approved

Asst. Prof. Dr. Md. Faruqul Islam, PT

Address: Saic Tower, M-1/6, Mirpur-14, Dhaka-1206. Mobile: 01936005804
E-mail: simt140@gmail.com, Web:www.saicmedical.edu.bd

SAIC COLLEGE OF MEDICAL SCIENCE AND TECHNOLOGY

Approved by Ministry of Health and Family Welfare
Affiliated with Dhaka University

Ref : *Date :* .....

Ref.No: *SCMST/PT/ERB-2017-18/1-2023/44(a)*

7th February'2023

To

The Incharge

Saic Physiotherapy & Rehabilitation Services

Saic College of Medical Science and Technology (SCMST)

Mirpur-14, Dhaka-1216.

Sub: Permission to collect data

Dear Ahmed,

Ethical review board (ERB) of SCMST pleased to inform you that your proposal has been reviewed by ERB of SCMST and we are giving you the permission to conduct study entitled "Effectiveness of chiropractic adjustment to reduce discogenic cervical pain" and for successful completion of this study you can start data collection from now.

Wishing you all the best.

Thanking You,

Head of ERB
Ethical Review Board
Saic College of Medical Science and Technology

09.02.23
Principal
Saic College of Medical Science and Technology
Mirpur-14, Dhaka-1216

Allowed to Collect Data

Physio. Md. Shahidul Islam
BSPT, MSPT (DU)
Manual Therapy (India)
Consultant & Clinical Head
Saic Physiotherapy & Rehabilition Services

Address: Saic Tower, M-1/6, Mirpur-14, Dhaka-1206. Mobile: 01936005804
E-mail: simt140@gmail.com, Web:www.saicmedical.edu.bd

SAIC COLLEGE OF MEDICAL SCIENCE AND TECHNOLOGY

Approved by Ministry of Health and Family Welfare
Affiliated with Dhaka University

Ref : *Date :* .....

15th February'2023

To

Coordinator

Academy of Physiotherapy Pain and Rehabilitation Centre

Mirpur-10, Dhaka-1216.

Sub: Permission to collect data.

Dear Sir,

Ethical review board (ERB) of SCMST pleased to inform you that Rasel Ahmed of final year B.Sc. in Physiotherapy student from Saic College of Medical Science and Technology doing a thesis entitle of "Effectiveness of chiropractic adjustment to reduce discogenic cervical pain" which has been reviewed by ERB of SCMST and we are giving permission to him to conduct this study. His data collection area is within Dhaka, so he wants to take data from your department.

I hope you will give kind permission to collect data to complete his study successfully and oblige thereby.

Thanking You,

15/02/23

Head of ERB

Ethical Review Board

Saic College of Medical Science and Technology

23.02.23

Principal

Saic College of Medical Science and Technology

Mirpur-14, Dhaka-1216

Allowed to collect data

27.02.2023

ACADEMY OF PHYSIOTHERAPY ★ Since: 2012 ★

Address: Saic Tower, M-1/6, Mirpur-14, Dhaka-1206. Mobile: 01936005804
E-mail: simt140@gmail.com, Web:www.saicmedical.edu.bd

Appendix - C

সম্মতি পত্র

আসসালামু আলাইকুম/ নমস্কার,

আমি রাসেল আহমেদ, সাইক কলেজ অব মেডিকেল সাইন্স অ্যান্ড টেনোলজি এর বিএসসি ইন ফিজিওথেরাপি বিভাগের শেষ বর্ষের ছাত্র। আমি আমার শেষ বর্ষের পড়াশোনা শেষ করার জন্য একটি গবেষণা করছি যার শিরনাম হচ্ছে "ঘাড়ের মেরুদণ্ড জনিত ব্যথায় কাইরো চিকিৎসার উপকারিতা"। এটা আমার অধ্যয়নের একটা অংশ। উল্লেখ্য অধ্যয়ন পরিচালনার জন্য প্রয়োজনীয় কিছু প্রশ্নের তালিকা নিচে দেওয়া আছে। আপনাকে আমার গবেষণার জন্য নির্বাচন করা হয়েছে। এই গবেষণার জন্য আপনাকে কিছু প্রশ্ন করা হবে, যা ১৫-২০ মিনিটের মত লাগবে। আমার গবেষণার নাম হচ্ছে "**ঘাড়ের মেরুদণ্ড জনিত ব্যথায় কাইরো চিকিৎসার উপকারিতা "**।

সাক্ষাৎকার নেওয়ার সময় যদি আপনি কোন মানসিক অশান্তি, সামাজিক ও অর্থনৈতিক ঝুকি অথবা অন্যকোন শারীরিক সমস্যা বোধ করেন তাহলে আমাকে বলবেন, আমি তাৎক্ষনিক সাক্ষাৎকার বন্ধ করে দিবো। আমি প্রতিশ্রুতি দিচ্ছি যে এইটা আপনার জন্য কোন ক্ষতি বা ঝুঁকির কারন হবে না। এই সাক্ষাৎকারে আপনার অংশ গ্রহন হচ্ছে আপনার নিজের ইচ্ছায় এবং আপনি যে কোন সময় চাইলে এইটা বন্ধ করতে পারবেন। সাক্ষাৎকার চলাকালীন সময় যদি আপনার কোন প্রশ্নের উত্তর দিতে ইচ্ছা না করে তাহলে আপনি সেটা বাদ দিতে পারবেন। সাক্ষাৎকার বিষয়ে আপনার কোনকিছু জানার থাকলে আপনি আমার সুপারভাইজার সহকারী অধ্যাপক জাহিদ বিন সুলতান নাহিদ এর সাথে যোগাযোগ করতে পারবেন মিরপুর, ঢাকা। সাক্ষাৎকার শুরু করার আগে কি আপনার কোন প্রশ্ন আছে?

হ্যাঁ ☐ না ☐

গবেষকের স্বাক্ষর..... তারিখ.....

অংশগ্রহণ কারীর স্বাক্ষর..... তারিখ.....

মোবাইল নাম্বর.....

সাক্ষীর স্বাক্ষর..... তারিখ.....

সাক্ষীর মোবাইল নাম্বার.....

Consent Form (English)

Assalamu Alaikum/Nomoskar,

I am Rasel Ahmed, a student of the B. Sc. In physiotherapy programme in the department of Saic College of Medical Science and Technology, which is affiliated with Dhaka University. I am conducting a study entitled "Effectivity of Chiropractic Adjustment for Disogenic Cervical Pain." It is part of my B.Sc. in physiotherapy degree. Note that the following is a list of question papers required to conduct the study. This list has been selected to give you information about this study. I would like to give you a description of this study and answer any of your questions. It takes about 15–20 minutes.

My project is "**Effectiveness of Chiropractic Adjustment for Discogenic Cervical Pain.**"

During the interview period, if you feel any emotional disturbance, social and economic risk, or any other discomfort or physical risk, please tell me, and I will stop the interview immediately. I am committed to ensuring that the study will not be harmful or risky for you. Your participation in this study is voluntary, and you may withdraw yourself at any time during this study without any negative consequences. You also have the right not to answer a particular question that you don't like or do not want to answer during the interview. If you have any queries about the study or your rights as a participant, you may contact me or my supervisor, Zahid Bin Sultan Nahid, Assistant Professor & Head, Department of Physiotherapy SCMST, Mirpur-14, Dhaka.

Do you have any questions before I start?

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

YES ☐ NO ☐

Signature of the researcher: …… Date: ……....

Signature of the Participant: …… Date: …….

Mobile No: ……

Signature of the Witness: …… Date: …….

Mobile No: ……

Appendix - D

প্রশ্নপত্র (বাংলা)

ঘাড়ের মেরুদণ্ড জনিত ব্যথাইয় কাইরো চিকিৎসার উপকারিতা নির্ণয়ঃ

কোড নম্বরঃ | | | তারিখঃ.....

রোগীর নামঃ.....

ঠিকানাঃ.....

মোবাইলঃ.....

বিভাগঃ ১ সামাজিক জীবন সংক্রান্ত তথ্য (দয়া করে উত্তর এ √ টিক দিন)

সিরিয়াল	প্রশ্ন	উত্তর	ফলাফল
১	বয়স		
২	লিঙ্গ	১। পুরুষ ২। মহিলা ৩। অনন্যা	
৩	আবাসস্থান	১। শহর ২। মফস্বল ৩। গ্রাম	
৪	শিক্ষাগত যোগ্যতা	১। নিরক্ষর ২। প্রাথমিক শিক্ষা ৩। এস এস সি ৪। এচ এস সি ৫। স্নাতক ৬। অনন্যা	

৫	পেশা	১। কৃষক ২। দিনমজুর ৩। শিক্ষক ৪। চাকুরীজীবী ৫। গৃহিণী ৬। ব্যাবসায়ি ৭। অন্যান্য	
৬	মাসিক আয়		
৭	বৈবাহিক অবস্থা	১। বিবাহিত ২। অবিবাহিত ৩। তালাক প্রাপ্ত ৪। বিধবা / বিপত্নি	

বিভাগঃ ২। ব্যথা সম্পরকিত প্রশ্ন

প্রশ্নের এই অংশ রোগী নিজে পুরন করবে। আপনার উত্তর আপনি টিক দিন।

সিরিয়াল	প্রশ্ন	উত্তর	ফলাফল
১	ব্যথার সময়কাল	১। .....বছর ২।.....মাস ৩।.....সপ্তাহ	
২	ব্যথার কারন	১। অনেকক্ষণ বসেথাকলে ২। অনেকক্ষণ সুয়েথাকলে ৩। অনেকক্ষণ কাজ করলে ৪। অন্যান্য	
৩	ব্যথা কি হাতের দিকে ধাবিত হয়	১। হ্যাঁ ২। না	
	৩.১। যদি হ্যা হয় তাহলে এই প্রশ্নের উত্তর দিন। ব্যথা কোন দিকে ধাবিত হয়?	১। এক পাশে কনুই এর উপর ২। এক পাশে কনুই এর নিচে ৩। দুই পাশে কনুই এর উপর ৪। দুই পাশে কনুই এর নিচে	
৪	ব্যাথার মাত্রা ০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ ব্যথা নেই সহ্য করার মত অতিরিক্ত ব্যথা	প্রাথমিক পরীক্ষা	শেষ পরীক্ষা

ঘাড়ের অক্ষমতা সূচক

বিভাগ	প্রশ্ন	প্রাথমিক পরীক্ষা	শেষ পরীক্ষা	ফলাফল
১	**ব্যথার তিব্রতা** ০. এই মুহূর্তে আমার ঘাড়ে কোন ব্যথা নেই। ১. এই মুহূর্তে ব্যথা খুব হালকা। ২. এই মুহূর্তে ব্যথা মাঝারি। ৩. এই মুহূর্তে ব্যথা মোটামুটি তীব্র। ৪. এই মুহূর্তে ব্যথা খুব বেশি তীব্র। ৫. এই মুহুর্তে আমার ব্যথা সবচেয়ে খারাপ।			
২	**ব্যক্তিগত যত্ন** ০. কোন ঘাড়ের ব্যথা ছাড়াই আমি সাধারণত নিজের যত্ন নিতে পারি। ১. আমি সাধারণত নিজের যত্ন নিতে পারি, তবে এটি ঘাড়ের ব্যথার কারণ হয়। ২. নিজের দেখাশোনা করা কষ্টকর কিন্তু আমি ধীরে এবং সতর্কতার সাথে করতে পারি। ৩. আমার কিছু সাহায্য দরকার কিন্তু আমার ব্যক্তিগত যত্নের অধিকাংশই নিজে করতে পারি। ৪. আত্ম-যত্নের বেশিরভাগ ক্ষেত্রে আমার প্রতিদিন সাহায্যের প্রয়োজন হয়। ৫. আমি আমার পোষাক পরিধান করতে পারি না, ধৌতকরন করা আমার জন্য কষ্টদায়ক এবং আমি বেশির সময় বিছানায় শুয়ে থাকি।			
৩	**উত্তোলন** ০. ঘাড়ের ব্যথা ছাড়াই আমি ভারী ওজন তুলতে পারি। ১. আমি ভারী ওজন তুলতে পারি, কিন্তু এটি আমার ঘাড়ের ব্যথার কারন হয়। ২. ঘাড়ের ব্যথার কারনে আমি মেঝে থেকে ভারী ওজন তুলতে পারি না তবে এগুলো সুবিধাজনকভাবে, যেমন, টেবিলে রাখা থাকলে তা তুলতে পারি।			

	৩. ঘাড়ের ব্যথার আমাকে ভারী ওজন তুলতে বাধা দেয়, তবে আমি হালকা ওজন তুলতে পারি যদি সেগুলি সুবিধামত অবস্থানে থাকে। ৪. আমি শুধুমাত্র খুব হালকা ওজন তুলতে পারি। ৫. আমি কিছুই তুলতে বা বহন করতে পারি না।			
৪	**পড়া** ০. আমি ঘাড়ের ব্যথার ছাড়াই যত খুশি পড়তে পারি। ১. সামান্য ঘাড়ের ব্যথার সাথে আমি যত খুশি পড়তে পারি। ২. আমি মাঝারি ঘাড়ের ব্যথার সাথে যতটা চাই ততটা পড়তে পারি। ৩. মোটামোটি তীব্র ঘাড়ের ব্যথার কারণে আমি যতটা চাই ততটা পড়তে পারি না। ৪. তীব্র ঘাড়ের ব্যথার কারণে আমি যতটা চাই ততটা পড়তে পারি না। ৫. আমি মোটেই পড়তে পারি না।			
৫	**মাথাব্যথা** ০. আমার কোন মাথাব্যথা নেই। ১. আমার সামান্য মাথাব্যথা আছে যা প্রায়ই আসে। ২. আমার মাঝারি মাথাব্যথা আছে যা প্রায়ই আসে। ৩. আমার মাঝারি মাথাব্যথা আছে যা ঘন ঘন আসে। ৪. আমার তীব্র মাথাব্যথা আছে যা ঘন ঘন আসে। ৫. আমার প্রায় সব সময় মাথাব্যথা থাকে।			
৬	**মনোযোগ** ০. আমি কোন অসুবিধা ছাড়াই পুরোপুরি মনোনিবেশ করতে পারি। ১. আমি সামান্য অসুবিধা সঙ্গে সম্পূর্ণরূপে মনোনিবেশ করতে পারি। ২. আমার মনোযোগ দিতে যথেষ্ট অসুবিধা হয়। ৩. আমার মনোযোগ দিতে অনেক কষ্ট হয়। ৪. আমার মনোযোগ দিতে অনেক বেশি কষ্ট হয়। ৫. আমি মোটেই মনোযোগ দিতে পারি না।			

৭	**কাজকরা** ০. আমি যতটা চাই ততটা কাজ করতে পারি। ১. আমি শুধুমাত্র আমার স্বাভাবিক সব কাজ করতে পারি, কিন্তু অতিরিক্ত কিছু করতে পারি না। ২. আমি আমার স্বাভাবিক কাজ অধিকাংশ করতে পারি, কিন্তু এর বেশি কিছু করতে পারি না। ৩. আমি আমার স্বাভাবিক কাজ করতে পারি না। ৪. আমি খুব কমই কাজ করতে পারি। ৫. আমি কোনো কাজই করতে পারি না।			
৮	**গাড়ী চালানো** ০. আমি ঘাড়ের ব্যথার ছাড়াই আমার গাড়ি চালাতে পারি। ১. আমি শুধুমাত্র সামান্য ঘাড়ের ব্যথা নিয়ে আমার গাড়ী চালাতে পারি। ২. মাঝারি ঘাড়ের ব্যথার নিয়ে আমি যতক্ষণ চাই ততক্ষণ গাড়ি চালাতে পারি। ৩. মাঝারি ঘাড়ের ব্যথার কারণে আমি যতক্ষণ চাই ততক্ষণ গাড়ি চালাতে পারি না। ৪. তীব্র ঘাড়ের ব্যথার কারণে আমি খুব কমই গাড়ি চালাতে পারি। ৫. ঘাড়ের ব্যথার কারণে আমি আমার গাড়ি চালাতে পারি না।			
৯	**ঘুম** ০. আমার ঘুমাতে কোন সমস্যা হয় না। ১. আমার ঘুম ১ ঘন্টার কম সময়ের জন্য সামান্য ব্যাহত হয়। ২. আমার ঘুম ১-২ ঘন্টা পর্যন্ত হালকাভাবে ব্যাহত হয়। ৩. আমার ঘুম ২-৩ ঘন্টা পর্যন্ত মাঝারিভাবে ব্যাহত হয়। ৪. ৩-৫ ঘন্টা পর্যন্ত আমার ঘুম ব্যাপকভাবে ব্যাহত হয়। ৫. আমার ঘুম ৫-৭ ঘন্টা পর্যন্ত সম্পূর্ণভাবে ব্যাহত হয়।			
১০	**বিনোদন** ০. আমি ঘাড়ের ব্যথার ছাড়াই আমার সমস্ত বিনোদনমূলক ক্রিয়াকলাপে নিযুক্ত থাকতে পারি।			

	১. আমি সামান্য ঘাড়ের ব্যথার নিয়ে আমার সব বিনোদনমূলক কার্যকলাপ নিযুক্ত থাকতে সক্ষম। ২. আমার ঘাড়ের ব্যথার কারণে আমি বেশিরভাগ বিনোদনমূলক কার্যকলাপ ক্ষেত্রেই নিযুক্ত হতে পারি, কিন্তু আমার সমস্ত বিনোদনমূলক ক্রিয়াকলাপে নয়। ৩. ঘাড়ের ব্যথার কারণে আমি আমার কয়েকটি বিনোদনমূলক ক্রিয়াকলাপে নিযুক্ত হতে পারি। ৪. ঘাড়ের ব্যথার কারণে আমি খুব কমই বিনোদনমূলক কাজ করতে পারি। ৫. ঘাড়ে ব্যথার কারণে আমি কোনো বিনোদনমূলক কাজ করতে পারি না।			

ফলাফলঃ

ঘাড়ের অক্ষমতা সূচক

হিসাবঃ যোগফল

প্রাথমিক পরীক্ষা	শেষ পরীক্ষা

Questionnaire (English)

Identify the effectiveness of chiropractic adjustment for discogenic cervical pain.

Date: ……

Code No: | | |

Participant name: …….

Address: ……...

Mobile: ……

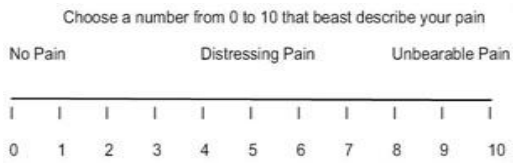
Section: 1. Socio-demographic information (kindly give tick √ to the answer)

S/N	Question	Answer	Outcome
1	Age		
2	Gender	1. Male 2. Female 3. Others	
3	Living area	1. Urban 2. Semi urban 3. Rural	
4	Educational qualification	1. Illiterate 2. Primary 3. S.S.C. 4. H.S.C. 5. Graduate 6. Others	
5	Profession	1. Farmer 2. Day labor 3. Teacher 4. Service holder 5. House wife 6. Businessman 7. Others	
6	Monthly income		

7	Marital status	1. Married 2. Unmarried 3. Divorce 4. Widow	

Section: 2. Pain related question (Before treatment)

This part of questionnaire will be fill by the patient. Mark out your pain intensity with circle on the question written below.

S/N	Question	Answer	Outcome
1	Duration of pain	1…….. Year 2……. Month 3……. Week	
2	Causes pain	1. long time setting 2. long time lying 3. long time work 4. Others	
3	Is the pain radiate to hand?	1. Yes 2. No	
	3.1 If, yes than please answer the next question. Where radiation your pain?	1. Unilateral above elbow 2. Unilateral below elbow 3. Bilateral above elbow 4. Bilateral below elbow	
4	Severity of pain (NPRS)  (McCaffery & Beebe, 1993)	Pre test	Post test

Neck Disability Index

Section	Question	Pre-test	Post-test	Out come
1	**Pain intensity** 0. I have no neck pain at the moment. 1. The pain is very mild at the moment. 2. The pain is moderate at the moment. 3. The pain is fairly severe at the moment. 4. The pain is very severe at the moment. 5. The pain is the worst imaginable at the moment.			
2	**Personal care** 0. I can look after myself normally without causing extra neck pain. 1. I can look after myself normally, but it causes extra neck pain. 2. It is painful to look after myself, and I am slow and careful. 3. I need some help but manage most of my personal care. 4. I need help every day in most aspects of self- care. 5. I do not get dressed. I wash with difficulty and stay in bed.			
3	**Lifting** 0. I can lift heavy weights without causing extra neck pain. 1. I can lift heavy weights, but it gives me extra neck pain. 2. Neck pain prevents me from lifting heavy weights off the floor but can manage if items are conveniently positioned, ie, on a table. 3. Neck pain prevents me from lifting heavy weights, but I can manage light weights if they are conveniently Positioned 4. I can lift only very light weights. 5. I cannot lift or carry anything at all.			
4	**Reading** 0. I can read as much as I want with no neck pain. 1. I can read as much as I want with slight neck pain.			

	2. I can read as much as I want with moderate neck pain. 3. I can't read as much as I want because of moderate neck pain. 4. I can't read as much as I want because of severe neck pain. 5. I can't read at all.			
5	**Headaches** 0. I have no headaches at all. 1. I have slight headaches that come infrequently. 2. I have moderate headaches that come infrequently. 3. I have moderate headaches that come frequently. 4. I have severe headaches that come frequently. 5. I have headaches almost all the time.	☐	☐	☐
6	**Concentration** 0. I can concentrate fully without difficulty. 1. I can concentrate fully with slight difficulty. 2. I have a fair degree of difficulty concentrating. 3. I have a lot of difficulty concentrating. 4. I have a great deal of difficulty concentrating. 5. I can't concentrate at all.	☐	☐	☐
7	**Work** 0. I can do as much work as I want. 1. I can only do my usual work, but no more. 2. I can do most of my usual work, but no more. 3. I can't do my usual work. 4. I can hardly do any work at all. 5. I can't do any work at all.	☐	☐	☐
8	**Driving** 0. I can drive my car without neck pain. 1. I can drive my car with only slight neck pain. 2. I can drive as long as I want with moderate neck pain.	☐	☐	☐

	3. I can't drive as long as I want because of moderate neck pain. 4. I can hardly drive at all because of severe neck pain. 5. I can't drive my care at all because of neck pain.			
9	**Sleeping** 0. I have no trouble sleeping. 1. My sleep is slightly disturbed for less than 1 hour. 2. My sleep is mildly disturbed for up to 1-2 hours. 3. My sleep is moderately disturbed for up to 2-3 hours. 4. My sleep is greatly disturbed for up to 3-5 hours. 5. My sleep is completely disturbed for up to 5-7 hours.			
10	**Recreation** 0. I am able to engage in all my recreational activities with no neck pain at all. 1. I am able to engage in all my recreational activities with some neck pain. 2. I am able to engage in most, but not all of my recreational activities because of pain in my neck. 3. I am able to engage in a few of my recreational activities because of neck pain. 4. I can hardly do recreational activities due to neck pain. 5. I can't do any recreational activities due to neck pain.			

Result:

Neck Disability Index

Calculation: Summation

Pre-test	Post-test

Gantt Chart

Activities	July 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	April 23	May 23	Jun 23
Proposal Presentation												
Introduction												
Literature Review												
Methodology												
Data Collection												
Data Analysis												
Result												
1st progress Presentation												
Discussion												
Conclusion And Recommendation												
2nd progress Presentation												
Communication With Supervisor												
Final Submission												