EFFECTIVENESS OF EDUCATIONAL BOOKLET FOR CHRONIC NECK PAIN

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

Session: 2009-2010

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We the under sign certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for the acceptance of this dissertation entitled

EFFECTIVENESS OF EDUCATIONAL BOOKLET FOR CHRONIC NECK PAIN

Submitted by **Romesa Nasir** for the partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B. Sc. PT).

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DECLERATION

I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also decline that for any publication, presentation or dissemination of information of the study. I would bind to take written consent of my supervisor and Head of Physiotherapy department, BHPI.

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Acronyms

BHPI   Bangladesh Health Professions Institute

CRP   Centre for the Rehabilitation of the Paralyzed

MS   Musculo-skeletal

NSAID's   Non-Steroidal Anti-inflammatory Drugs

PT   Physiotherapy

RCT   Randomized Control Trail

ROM   Range of Movement

NPR   Numeric Pain Rating scale

WHO   World Health Organization

DW   Disability Weight

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Abstract

Purpose: The purpose of the study was to explore the effectiveness of educational booklet with conventional physiotherapy compare to only conventional physiotherapy for chronic neck pain. *Objectives:* To compare pain intensity at rest, activity, sitting, standing, walking, sleeping, neck turning and flexion and ROM in flexion, extension and rotation before and after the educational booklet with conventional physiotherapy and conventional Physiotherapy alone in Patients with chronic neck pain. *Methodology:* Sixteen patients with chronic neck pain were randomly selected from outdoor musculo-skeletal unit, CRP and then 8 patients with chronic neck pain were randomly assigned to educational booklet with conventional physiotherapy group and 8 patients to the only conventional physiotherapy group. The study was conducted at musculoskeletal department of CRP, savar. Numeric Pain Rating Scale was used to measure the pain intensity in different functional position and Goniometer to measure the ROM. Unrelated "t" test was used to compare the results of ROM and Pain was analyzed by using Mann Whitney 'U' test. *Results:* In Experimental group, Mean difference of reduction of pain in sitting was 6 which were 5.75 in control group. Also there was improvement of pain reduction in mean difference during sleeping which was 0.12 more than control group. But the result of U test showed that there was no improvement in case of resting pain ($p>0.10$), during activity pain ($p>0.10$), during sitting pain ($p>0.10$), during standing pain ($p>0.10$), during walking pain ($p>0.10$), during sleeping pain ($p>0.10$), during neck turning pain ($p>0.10$) and during neck flexion pain ($p>0.10$). The study also found significant Improvement of ROM In case of neck flexion ($p<0.01$). *Conclusion:* This experimental study shows that there was no significant difference between educational booklet with conventional physiotherapy and only conventional physiotherapy for patients with chronic neck pain.

Key words: Neck pain, Educational Booklet, Chronic pain

CHAPTER- I	INTRODUCTION

1.1 Background

Bangladesh is a well developing densely populated country. The area of the nation is 147,570 square kilometers (56,977 squares miles) (Bangladesh Bureau of Statistics, 2011). The total populations of the nation are 14, 97, 72, 364 (Bangladesh Bureau of Statistics, 2011). According to the World Bank the population density (people per sq. km.) in Bangladesh was last measured in 2011 which was 1174.33. So the living standards of the people of Bangladesh are below the standard. As a result they are deprived of proper health and medical care. Musculoskeletal problems are one of the most common health problems in Bangladesh as well as in other countries. Taking a broad spectrum there are thousands of different musculoskeletal problems, including neck pain.

Neck pain and other related disorders are very common all over the world. It is the eighth leading cause of disability in the United States and fourth worldwide (Sberman et al., 2014). Neck pain is the pain which may be experienced anywhere from the base of the skull at ear level to the upper part of the back or shoulder (Sabeen et al., 2013). It is estimated that in every year 30-50% of adults experience a significant form of neck pain (Mantyselka et al., 2010).On general health showed that 15% of patient reported about grade 2 to 4 neck pain (Manchikanti et al., 2013). It is also a common symptom among the middle aged population and it has been shown that 24% of males and 37% of females suffer from neck pain (Mantyselka et al., 2010). It has also been shown that neck pain is most common between the ages of 40-50 with a reported prevalence of 83 people per 100,000 population (Physiopedia, 2013). In Sweden, females aged between 35-44 had a higher risk of having long and medium-term neck pain and ≥65 aged males had a higher risk of having long and medium term neck pain symptoms than males aged between 35-44 (Linder et al., 2012).Work related neck disorders are common problems in office workers, especially among those who are intensive computer users. The highest

prevalence has been found among Pakistani computer users (72%) than among the bank workers (45.7%) (Sabeen et al., 2013).

Consequently, neck pain has been a source of disability which may require substantial health care resources and treatments (Cheng & Huang, 2014). Physiotherapy has a wide ranging role at all stages of neck pain to help the patient return early to normal activities (Moffett & Mclean, 2006). Physiotherapy usually forms part of the treatment offered for patients with neck pain and it includes specific exercise programs like Mckenzie approach, manual therapy (spinal manipulation and mobilization), traditional massage, physical modalities and proper patient education (Moffett & Mclean, 2006).

A review of the literature shows that patient education in the form of a brief intervention can be effective for chronic back pain (Moffett & Mclean, 2006). So this study focuses on the effectiveness of an educational booklet with a brief intervention for chronic neck pain.

1.2 Rationale

Neck pain is a musculoskeletal disorder and it is true that compared with the incidence of low back pain the percentage of neck pain sufferers is relatively low. But according to modern science the rate of neck pain is gradually increasing day by day in Bangladesh as in the whole world. Physiotherapy plays a vital role in the management of neck pain. This type of experimental study is very important to provide a platform for the physiotherapy profession itself, and also to build up awareness among the people about their posture and other factors which aggravated the neck pain. The findings of the study give the profession clearer evidence on which physiotherapy practice are based, and that's why patients are also benefited. The educational booklet is also beneficial for those people who come from far and cannot continue the treatment. Positive outcome indicates that a physiotherapy educational booklet is more effective than the only physiotherapy intervention, for chronic neck pain. This research aims to discover the most effective intervention for neck pain.

1.3 Operational definition

1.3.a Neck pain: 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 a cervical condition.

1.3.b Chronic pain: This is usually associated with a long-term illness and Chronic pain can be the result of damaged tissue, but very often is attributable to nerve damage.

1.3.c Educational booklet: An educational booklet discusses the causes of neck pain, the prognosis, appropriate use of imaging studies and specialists, and activities for promoting recovery and preventing recurrences.

1.4 List of Variables

Independent variables
                                        Dependent variable

Age

Sex

Occupation

Physiotherapy &
Educational
booklet
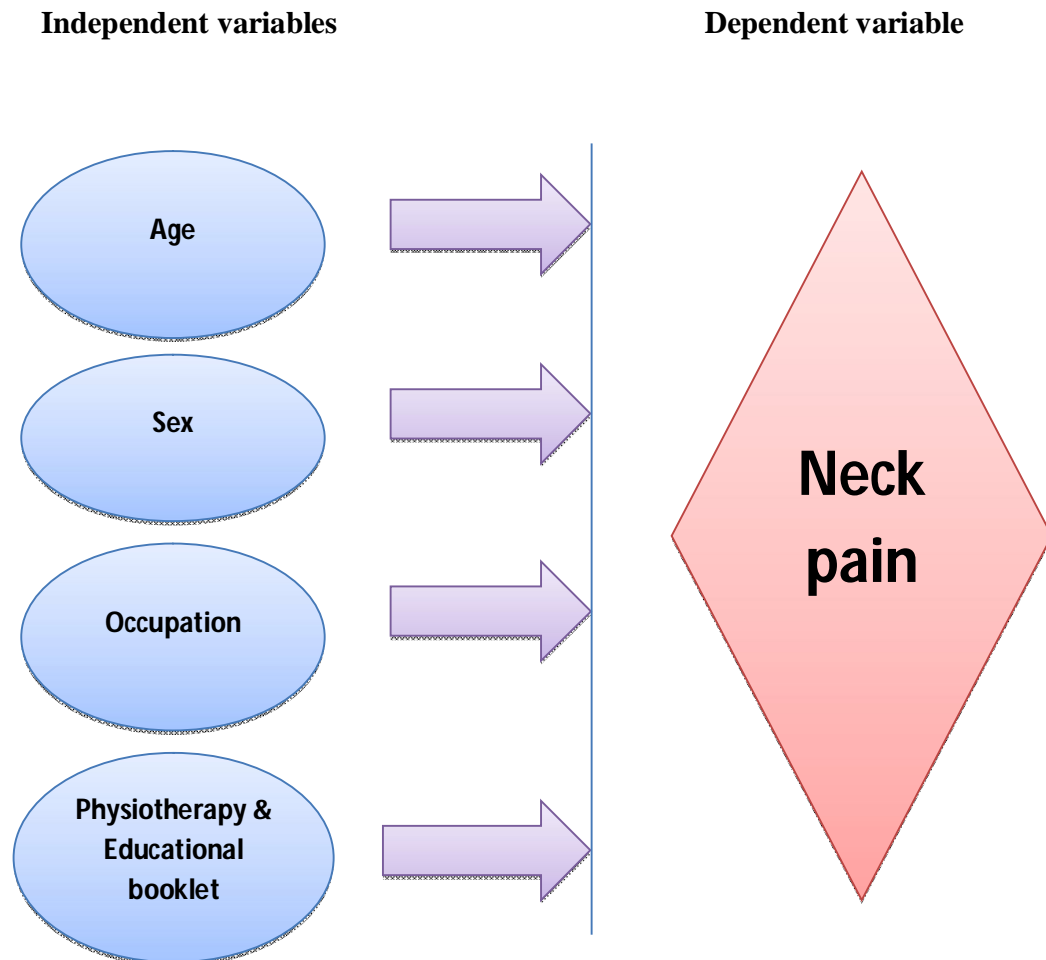
Neck
pain

1.5 Aim

To identify the effectiveness of providing an educational booklet along with conventional physiotherapy for chronic neck pain**.**

1.6 Objective

1.6.a General objective

- To find out the effectiveness of an educational booklet for chronic neck pain.

1.6.b Specific objective

- To evaluate the intensity of pain at resting position after using the educational booklet.
- To measure the intensity of pain during activity after using the educational booklet.
- To calculate the intensity of pain at different functional position (Sitting, Standing, Walking, sleeping, neck turning, neck bending).
- To estimate the range of motion of neck after using the educational booklet.

1.7 Hypothesis

Using the educational booklet along with giving conventional physiotherapy is more effective than only conventional physiotherapy.

1.8 Null hypothesis

Using the educational booklet along with conventional physiotherapy is no more effective than only conventional physiotherapy.

CHAPTER-II	LITERATURE REVIEW

Pain is a complex unpleasant phenomenon composed of sensory experiences. Pain has been described as the perception of noxious stimuli or the distressing sensations that result from tissue damage. According to International Association of the Study of Pain (IASP) (1994) "It is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in term of such damage." The pain pathway begins with the nerve ending and the nerve ending is the termination of a nerve, at the distal end of an axon which sends messages to the brain to feel sensations such as heat, cold, and pain (English Dictionary, 2014).

Pain may be classified on the basis of duration and nature. According to duration pain may be classified as acute and chronic pain, and according to nature it can be classified as nociceptive and non-nociceptive pain. Acute pain is a protective mechanism that alerts the individual to a condition or experience that is immediately harmful to the body and which usually persists less than 6 months (WebMD, 2014). It is frequently caused by damage to tissue such as bone, muscle, or organs, and the onset is often accompanied by anxiety or emotional distress (WebMD, 2014). Chronic pain is defined as persistent or intermittent pain usually lasting at least 6 months and is associated with a long-term illness, and may be the result of damaged tissue, but very often is attributable to nerve damage (WebMD, 2014). Nociceptive Pain arises from the actual or threatened damage to non-neural tissue and is due to the activation of nociceptors like somatic pain and visceral pain (IASP, 1994). Non-nociceptive Pain arises from actual or threatened damage to neural tissue, and pain caused by a lesion or disease of the somatosensory nervous system like central neuropathic pain or peripheral neuropathic pain (WebMD, 2014).

The International Association for the Study of Pain (1994) has defined peripheral neuropathic pain as ''pain initiated or caused by a primary lesion or dysfunction in the peripheral nervous system."

A pain impulse begins with the epidermal free nerve ending of the skin travelling via the first order neuron to the spinal cord, and there the first order neuron bonds with the second order neuron in the substantial gelatinosa area. From here the pain impulse enters the first spinothalamic tract, then the brain stem and finally the second order neuron synapse with the third order neuron in the thalamus to create the sensation of pain (Perl, 1971).

Neck pain is a common personal and social difficulty, and is a major cause of work disability (Moffett & Mclean, 2006). It is a sensation of discomfort in the neck area. Neck pain can result from disorders of any of the structures in the neck, 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).

The neck contains the top end of the spinal column or spine, which supports the head and also protects the spinal cord. The 7 bones in the neck are known as cervical vertebrae. These seven vertebrae are the bony building blocks of the spine in the neck surrounding the spinal cord. The neck nerve passes through between those vertebrae and many ligaments and muscles are attached to the spine, shoulder blade and back to make it more stable. Within the neck, structures include the neck muscles, arteries, veins, lymph glands, thyroid gland, parathyroid glands, esophagus, larynx, and trachea (Barbuto et al., 2008).

According to WHO (2013) the global burden of disease in chronic and mild neck pain (those with constant neck pain, those who have difficulty turning the head, holding the arms up, and those lifting things) is estimated as 0.101DW, and the global burden of disease in chronic and severe neck pain is estimated as 0.286 DW. Every year lives lost due to the disability of neck pain are 33.64 million, and the prevalence of neck pain is 4.8% (WHO, 2013).

Minor injuries or sprain to muscles and ligaments in the neck are known as mechanical neck pain which also include poor posture. The main feature of mechanical neck pain is pain in the cervical region, which is often accompanied by restriction of the range of motion and associated with functional limitations. Pain is experienced when free nerve

endings are irritated by mechanically deformed innervated structures. Long term lower intensity stresses and improper posture are believed to be the most common causal factor for neck pain (Sabeen et al., 2013). That may cause soft tissue abnormality due to injury or prolong wear or tear. Soft tissues are muscles, ligaments and nerves around the spine. In some people, neck problems maybe the source of pain in the upper back, shoulders or arms. When cervical disc causes pressure on the spinal cord or nerve roots then it's known as herniated cervical disc (Childs et al., 2008). Cervical disc herniation is another major cause of neck pain. Neck pain related to whiplash-associated disorders (WADs) most commonly results from motor vehicle accidents (Hoy et al., 2011). In this type of collision, first the body is carried forward and the head flips backwards. Then, as the body stops, the head is thrown forwards and following a whiplash injury there is often a delay before the pain and stiffness start (Hoy et al., 2011). Falling asleep in an awkward position and prolong use of a computer keyboard also causes of neck pain (Barbuto et al., 2008). There are several theories about why so many people suffer neck pain, but they are not supported by scientific proof. For most people, no specific reason for the pain can be found (Childs et al., 2008).

Pathological causes of neck pain are less common. It includes degenerative and inflammatory diseases like osteoarthritis, rheumatoid arthritis, ankylosing spondylitis, infection, epidural abscess, meningitis, metastatic carcinoma, osteoma, spinal cord tumors (Chan et al., 2014). This type of arthritis can cause major stiffness and pain.

Factors that are Physical workload such as repetitive motion, static posture, awkward posture and neck flexion or rotation have significant association with Neck Pain. Neck pain is also associated with poor posture, neck strain, occupational injuries, or sporting injuries. Four to five hours of daily computer use is considered as a risk factor for neck pain in adolescents (Sabeen et al., 2013). Psychological factors associated with disturbed sleep, headache, depression, anxiety and fear (Leonard et al., 2009). Other risk factors are overweight, lifting heavy weights, leaning forward to operate the computer, during using computer reduce activity of the cervical extensor muscles and higher activity in the upper trapezious (Hoy et al., 2011).

Neck pain usually resolves within days or weeks but it can rebound or become chronic. Neck pain causes severe disability in 5 percent of affected people (Guidon et al., 2007).

Different pharmacological approaches are existing for the treatment for neck pain such as the use of paracetamol (Acetaminophen), NSAIDs, opioids, antidepressant or muscle relaxant, local anesthetics, Canabinoids and others (Guidon et al., 2007). Traditional NSAIDs are widely prescribed as analgesics and anti-inflammatory agents but in long term anti-inflammatory therapy may develop serious gastrointestinal adverse effects (Rao & Knaus, 2008). Despite paracetamol is the most commonly used drug in everyday life due to low cost although the mechanism of action of its analgesic action is poorly understood (Graham & Scott, 2005). Recently transdermal spray with iontophoresis is commonly practicing method for neck pain (Guindon et al., 2007). A short course of diazepam for muscle relaxation is recommended because the risk of developing benzodiazepine dependency is high.

According to Moffett & Mclean (2006) on the basis of evidence-based guidelines and systematic review physiotherapy management for neck pain includes specific exercise programs (e.g. Mckenzie approach) and general exercise programs (e.g. mobilization and manipulation, Stretching, Massage, Physical modalities modalities).

The Mckenzie approach is one of the most frequently used types of physiotherapy for back and neck pain (Foster et al., 2000). One large trial of sub-acute and chronic back pain patient (n=260) found that the Mckenzie approach, when compared with intensive dynamic strengthening exercises, was slightly more effective at 2 months in improving function (Petersen et al., 2002). A systematic review of randomized control trial showed that in Mckenzie therapy for spinal pain long term follow up reduced greater disability (95%) than short term follow up (75%) (Clare et al., 2004a)

A number of different mobilization techniques are used in the treatment of neck pain. Clare has stated that (2005) there are three commonly used technique for upper cervical and seven common techniques for lower cervical spine problem.

In one study showed that, Mckenzie approach allows reliable classification of patient with lumber and cervical pain (Clare et al., 2004a;b)

Static muscle stretching uses as conventional physiotherapy, in which stretching a muscle up to a tolerable point and sustain the position for a certain period of time (Cunha et al., 2008). While static stretching of a single muscle or a small group of muscles usually lasts for 30 seconds and which is more effective than 15 seconds (Bandy et al., 2000).

Massage is the second most commonly used CAM (complementary and alternative medicine) therapy for neck pain (Goode et al., 2010). The process increases blood flow to the site and encourages the fascia to relax. There are different types of massage and Goode (2010) stated that myofascial release is a safe and very effective hands-on technique that involves applying gentle sustained pressure into the myofascial connective tissue restrictions to eliminate pain and restore motion. In a study it found that 60 minutes massage 2-3 times per week is more effective than 30 minutes massage 2-3 times per week (Sberman et al., 2014).

Physical modalities is commonly included as a part of physiotherapeutic intervention for neck pain and these includes transcutaneous electrical nerve stimulation (TENS), heat/cold, laser, traction, ultrasound, short wave, interferential, corsets and collars (Moffett & Mclean, 2006). There is limited evidence to suggest that electrotherapy (TENS, laser, ultrasound) is not effective for reducing neck pain (Panel, 2001).

A randomized control trial showed that among the 181 participants, control group were received only booklet and experimental group were received face to face advice with the booklet for chronic back pain and there were no difference of the primary outcome (Rantonen et al., 2014).

On another qualitative result showed that booklet was easy to read, understandable, believable and quantitative study showed a significant statistical improvement in whiplash injury (Mcclune et al., 2003).

CHAPTER-III	METHODOLOGY

This research was a quantitative evaluation of the educational booklet used along with conventional physiotherapy for chronic neck pain. To identify the efficacy and effectiveness of this treatment approach, two measuring tools were used. First the Numeric Pain Rating scale (NPR) was used as a measurement tool for measuring the pain intensity in several functioning positions, and second the Goniometer was used to measure the range of motion.

3.1 Study design

An experimental hypothesis predicts a relationship between two variables. The simplest way to find out whether this relationship actually exists is to alter one of these variables to see what difference it makes to the other. This is the basis of the experimental design. This alteration is known as manipulation of variables. This Study was done using a quantitative true (or classic) experimental different subject design. The researcher selected this design because true experimental design was the best known design for an undergraduate researcher (Depoy & Gatlin, 2011). So the study is a true experiment between different treatment designs. Conventional physiotherapy used together with an educational booklet was applied to the experimental group, and conventional Physiotherapy alone was applied to the control group. After the manipulation of the independent variables, the outcomes were compared. A pretest (before intervention) and posttest (after intervention) were administered with each participant of both groups to compare the pain effects before and after the treatment.

So, according to Depoy & Gitlin (2011) the design could be shown by-

R   r   x   o (experimental group)

R   r   o (control group)

3.2 Study area

Physiotherapy department of Musculoskeletal Unit, CRP, Savar, Dhaka- 1343.

3.3 Sample size

The equation of sample size calculation given below-

$$n = \left\{\frac{Z\left(1 - \frac{\alpha}{2}\right)}{d}\right\}^2 \times pq$$

Here,

$Z\left(1 - \frac{\alpha}{2}\right) = 1.96$

P = 0.72

q = 1- p

   = 1- 0.72

   = 0.37

d = 0.05

According to this equation the sample should be more than 398 people but due to lack of opportunity the study was conducted with 16 patients attending at the musculoskeletal department of physiotherapy in CRP.

3.4 Study population and sampling

16 patients with neck pain were selected through simple random sampling. The sample frame was made from the appointment record of respective units and after that the investigator gave particular ID to each participant of the sample frame. Subsequently, individual samples were selected from the sample frame by lottery and this was performed by the physiotherapist. When the samples were collected, the researcher randomly assigned the participants into experimental and control groups. The participants were given numbers C1, C2, C3 etc for the control group and E1, E2, E3 etc for experimental group. A total of 16 patients were included in this study, among them 8 patients were selected for the experimental group and the rest were selected for the control group. Patients were selected from CRP because they were easily accessible for the researcher. Patients were selected through some exclusion and inclusion criteria.

3.5. A Inclusion criteria

- Age between 25 to 50 years.
- Patients who have chronic neck pain.
- Both male and female both are included.
- Patients who are literate.
- Patients who have postural and derangement problems
- Those who showed willingness to participants.

3.5. B Exclusion criteria

- Patients who have pathological problems like tumors
- Neck deformity
- Neck dysfunction
- Severe trauma
- Adhesive capsulitis or other shoulder problems
- Post-operative conditions
- Patients who are not willing.

3.6 Methods of data collection

3.6.A Measurement tool

Numerical Pain Rating Scale (NPRS)-The NPRS was used for measuring the pain intensity in several function positions. The numerical rating scale has been widely used clinically for the assessment of pain (Cleland et al., 2008). Patients were asked to indicate the intensity of current, best and worst levels of pain using an 11-point scale, ranging from 0 (no pain) to 10 (worst pain imaginable) (Cleland et al.,2008).
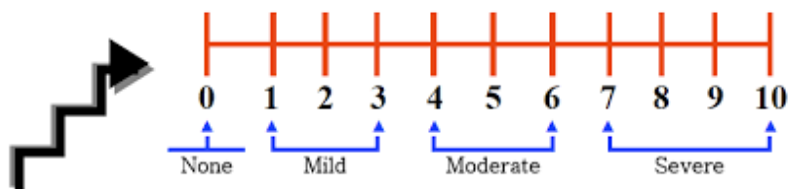
Goniometer (Double-Armed) –A goniometer was used for assessing a joint Range Of Motion (ROM). The most commonly used is the double-armed goniometer, where one arm stationary and another arm are movable. The pin or axis of the movable arm is placed directly over the center of the joint. The stationary arm is held in the line with the stationary segment of the joint. Then the movement is performed. At the completion of movement the indicator shows the number of degrees through which the segment has moved. The goniometer is a simple and accurate way of objective assessment of ROM.

3.6.B Data collection tools

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

3.6.C Questionnaire

The questionnaire was developed under the basis of Neck Bournemouth Questionnaire (NBR) and advice and permission of the supervisor with certain guidelines. There were **eight c**lose ended questions with Numerical Pain Rating scale (NPR) and four objective questions which were measured by the physiotherapist where each question was formulated to identify the change of pain with each activity.

3.6.D Data collection procedure

Data was gathered in three stages: pre-test, intervention and post-test, and the data were collected using a written questionnaire formatted by the researcher. The pretest was performed before beginning the treatment and the intensity of pain and Rang Of motion (ROM) of neck movements were noted with the Numeric Pain Rating scale and goniometer. The same procedure was performed to take the post-test at the end of six sessions of treatment. The researcher gave the assessment form to each patient before and after the six sessions of treatment, and instructed them to put a mark on the line of NPR according to their intensity of pain. After the first session researcher gave the educational booklet to the each participants of the experimental group. The researcher collected the data from both experimental and control groups in front of the qualified physiotherapist in order to reduce the risk of bias. The researcher did not give any treatment to either group. The researcher had given the responsibility to the physiotherapist to collect the data during the pre-test and post-test on both groups. In order to reduce the chance of error, the physiotherapist was provided with specific measurement and treatment guidelines, and the assessment form. The study was done by the single blind procedure. At the end of the study, a specific test was performing for statistical analysis.

3.7 Intervention

After randomization the patients were assigned into two groups, a control group and an experimental group. A common intervention program was executed for both groups as conventional physiotherapy. After the pilot study it includes-

1. Mckenzie approach:

A. Derangement :

    1. Unloading position: (rep- repetition)

- Repeated retraction in lying
  - 10 rep x 1 set
- Repeated extension in lying
  - 10 rep x 1 set
- Repeated retraction with extension in lying
  - 10 rep x 1 set
- Repeated retraction with lateral flexion in supine lying (over pressure)
  - rep x 1 set
- Repeated extension with traction and rotation in supine lying (if not progress)
  - 10 rep x 1 set
- Extension mobilization in prone lying.
  - 10 rep x 1 set
- Cervical traction in supine lying
  - 10 rep x 1 set

2. Loading position: (rep- repetition)

- Repeated retraction in sitting (over pressure)
  - 10 rep x 1 set
- Repeated extension in sitting (over pressure)
  - 10 rep x 1 set
- Repeated retraction with extension in sitting (over pressure)
  - 10 rep x 1 set
- Repeated retraction with lateral flexion in sitting (over pressure)
  - 10 rep x 1 set
- Repeated retraction with rotation in sitting (over pressure)
  - 10 rep x 1 set
- Repeated flexion in sitting (over pressure)
  - 10 rep x 1 set
- Flexion in sitting followed by extension in sitting (over pressure)
  - 10 rep x 1 set
- Postural correction

B. Postural syndrome:

- Repeated retraction in sitting and lying (over pressure)
  - 10 rep x 1 set
- Repeated extension in sitting and lying (over pressure)
  - 10 rep x 1 set
- Repeated retraction with extension in sitting and lying (over pressure)
  - 10 rep x 1 set
- Repeated flexion in sitting (over pressure)
  - 10 rep x 1 set
- Slouch overcorrect

20

- o Hold for few minutes
- Correction of sitting posture
  - o Use of a lumber roll
- Correction of standing posture
- Correction of lying posture
  - o Use of a cervical night roll

C. Others treatment:

a) Stretching exercise: hold for 30 sec x 3 times
- Lateral flexion
- Ipsilateral flexion and rotation
- flexion
- Extension

b) Soft tissue mobilization or massage

5 minutes x 2 set

c) Strengtheningexercise

10 rep x 1 set

d) Electrical traction

10 min x 10 sec rest x 60 sec hold x (body weight x 1/3)

kg

3.8 Ethical considerations

This research proposal was submitted for approval to the administrative bodies of the ethical committee of CRP. Again before beginning the data collection, the researcher obtained permission from the concerned authorities ensuring the safety of the participants. In order to eliminate ethical claims, the participants were free to receive treatment for other purposes as usual. Each participant was informed about the study before beginning and gave written consent.

3.9 Informed Consent

The researcher obtained a signed consent from every subject to participate in the study. The participants were informed that they have the right to meet with outpatient doctors if they think that the treatment is not enough to control the condition or if the condition becomes worse. The participants were also informed that they were completely free to decline answering any question during the study and were free to withdraw their consent and terminate participation at any time. Withdrawal of participation from the study would not affect their treatment in the physiotherapy department and they would still get the same facilities. Every subject had the opportunity to discuss their problems with the senior authority or administration of CRP and have any question answered to their satisfaction.

3.10 Data analysis

Mann-Whitney U test

This test is used for the analysis of the result of the experimental study which has two different un-matched groups of subjects. The U test is a nonparametric test that is simply compares the result obtained from the each groups to see if they differ significantly.

The formula of U test,

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

The end results after six sessions of intervention of both control group and trail group are shown in the table

Unrelated 't' test

Experimental studies with the different subject design where two groups are used and each tested in two different conditions and the data is interval or ratio should be analyzed with unrelated "t" test. Unrelated "t" test was used in this study to calculate the level of significance. Unrelated "t" test and mean difference was calculated to test the hypothesis on the basis of following assumptions-

- ✓ Data were ratio
- ✓ Two different set of subjects in two conditions

The "t" formula-

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\left[\sqrt{\frac{\left(\sum x_1^2 - \frac{(\sum x_1)^2}{n_1}\right) + \left(\sum x_2^2 - \frac{(\sum x_2)^2}{n_2}\right)}{(n_1-1)+(n_2-1)}} \times \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}\right]}$$

Where

$\overline{x}_1$ = mean of scores from trial group.

$\overline{x}_2$ = mean of scores from control group.

$(x_1)^2$= the square of the each individual score from trial group totaled.

$(x_2)^2$=the square of the each individual score from control group totaled.

$(\sum x_1)^2$= the total of the individual score from trial group squared.

$(\sum x_2)^2$= the total of the individual score from control group squared.

n_1= number of subjects from treatment group.

n_2= number of subjects from control group.

3.11 Significant level

In order to find out the significance of the study, the researcher calculated the "p" value. The p values refer the probability of the results for experimental study. The word probability refers to the accuracy of the findings. A p value is called level of significance for an experiment and a p value of <0.05 was accepted as significant result for health service research. If the p value is equal or smaller than the significant levels, the results are said to be significant.

Calculating the degree of freedom from the formula:

Degrees of freedom (df) = (n1-1) + (n2-1) = (8-1) + (8-1) = 14

Df	.20	.10	.05	.02	.01	.001
14	1.345	1.761	2.145	2.624	2.977	4.140

Table-1: Level of significance for two tailed hypothesis

3.12 Elimination of confounding variables

Confounding variable has an effect on the study variables which can affect the result of the study. There were some confounding variables such as patient's age, history of taking recent physiotherapy intervention, oral NSAID, steroid injection or other treatment which could influence the result of the study. Researcher found no significant difference between the mean age of two groups and the mean age of control group was 37 years and mean age of trial group was 41 years, so there was no effect of age which can influence the result. To control the confounding variables, researcher set the inclusion criteria as to include only those subjects who have no history of taking recent physiotherapy intervention, oral NSAID, steroid injection or other treatment.

3.13 Limitations

- The main limitation of this study was its short duration.
- The study was conducted with 16 patients of neck pain, which was a very small number of samples in both groups and was not sufficient enough for the study to generalize the wider population of this condition.
- It is limited by the fact daily activities of the subject were not monitored which could have influenced.
- Researcher only explored the effect of educational booklet after 6 sessions, so the long term effect of treatment was not explored in this study.
- The research was carried out in CRP, Savar such a small environment, so it was difficult to keep confidential the aims of the study for blinding procedure. Therefore, single blinding method was used in this study.
- There was no available research done in this area in Bangladesh. So, relevant information about neck pain patient with specific intervention for Bangladesh was very limited in this study.

Mean Age of the Participants

| Experimental Group | | Control Group | |
Subjects	Age (Years)	Subjects	Age (Years)
E1	35	C1	32
E2	50	C2	50
E3	35	C3	45
E4	45	C4	30
E5	45	C5	30
E6	50	C6	28
E7	28	C7	50
E8	40	C8	32
Mean Age	**41 years**	**Mean Age**	**37 years**

Table 2: Mean Age of Participants

Sex of the Participants

16 Patients with neck pain were included as sample of the study, among them almost 25% (n=4) were male and about 75% (n=12) were female.
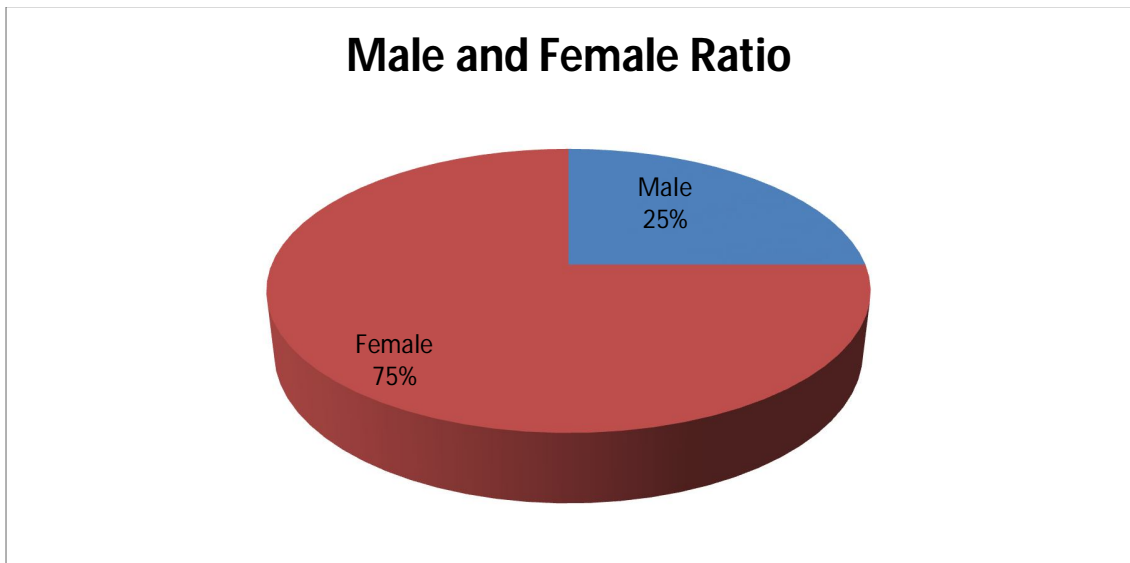
Figure 1: Gender Distribution

Resting pain: In chronic neck pain reduction of pain scores at rest were differences between pre-test and post-test pain scores for both control group and trial group.
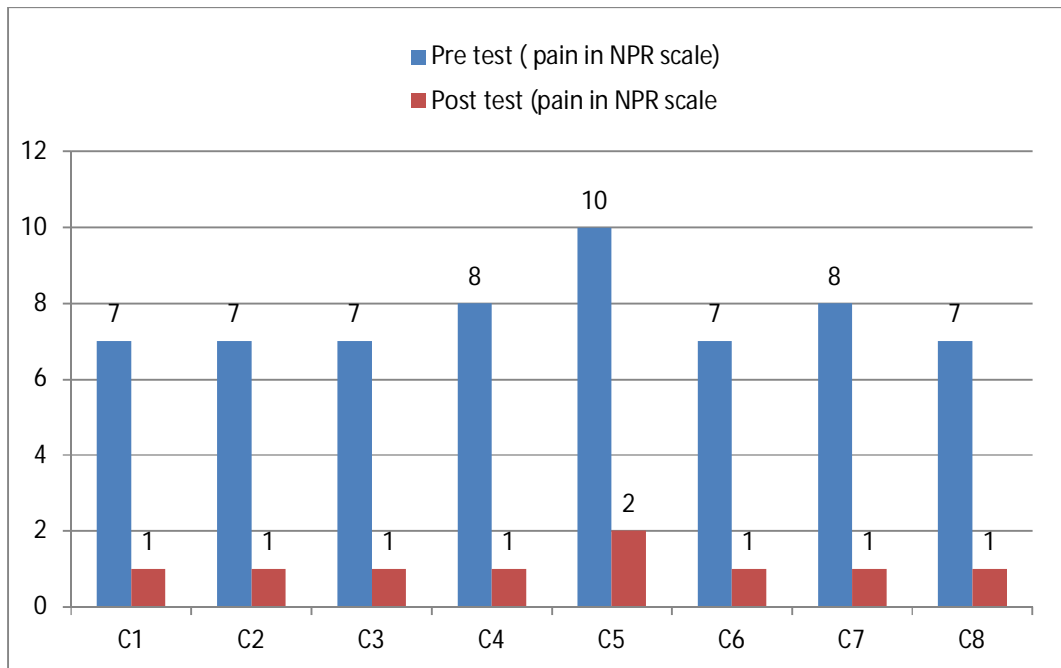
Figure 2: Reduction of resting pain in control group
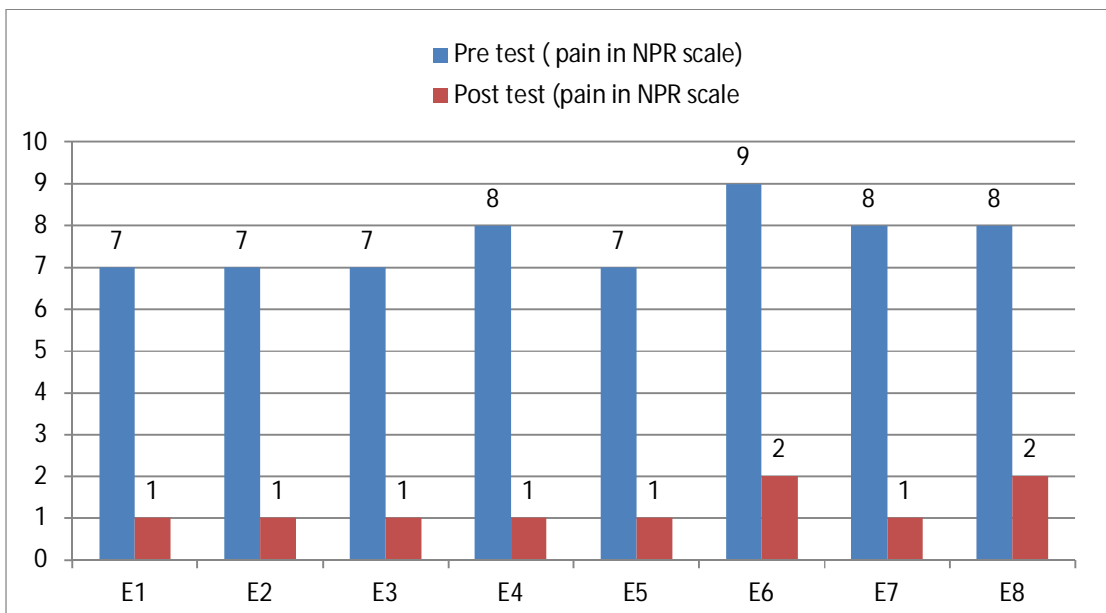
Figure 3: Reduction of resting pain in experimental group

28

Experimental group			Control group		
Subjects	Post-test pain score	Rank	Subjects	Post-test pain score	Rank
E_1	1	7	C_1	1	7
E_2	1	7	C_2	1	7
E_3	1	7	C_3	1	7
E_4	1	7	C_4	1	7
E_5	1	7	C_5	2	15
E_6	2	15	C_6	1	7
E_7	1	7	C_7	1	7
E_8	2	15	C_8	1	7
total	10	72	Total	9	64

Table-3: Reduction of resting pain in experimental and control group with rank

Here,

n_1 = the number of the subjects experimental group = 8

n_2 = the number of the subject in control group = 8

T_x = the larger rank total = 72

n_x = the number of the subjects in the condition with larger rank total .That is experimental group = 8

Now U formula:

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

$$= 8 \times 8 + \frac{8(8+1)}{2} - 72$$

$$= 64 + 36 - 72$$

$$= 100 - 72$$

$$= 28$$

The U-value is 28. The critical value of U at p≤ 0.10 is 15. Therefore, the result is not significant at p> 0.10.

Pain during activity: In chronic neck pain reduction of pain scores during activity were differences between pre-test and post-test pain scores for both control group and trial group.
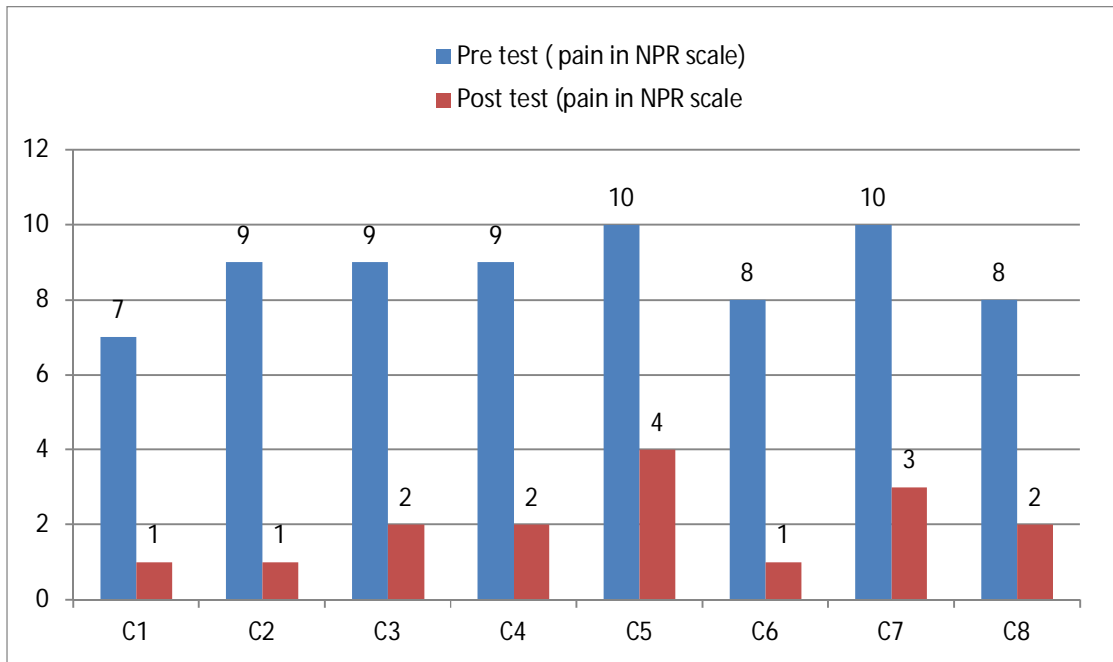
Figure 4: Reduction of pain during activity in control group
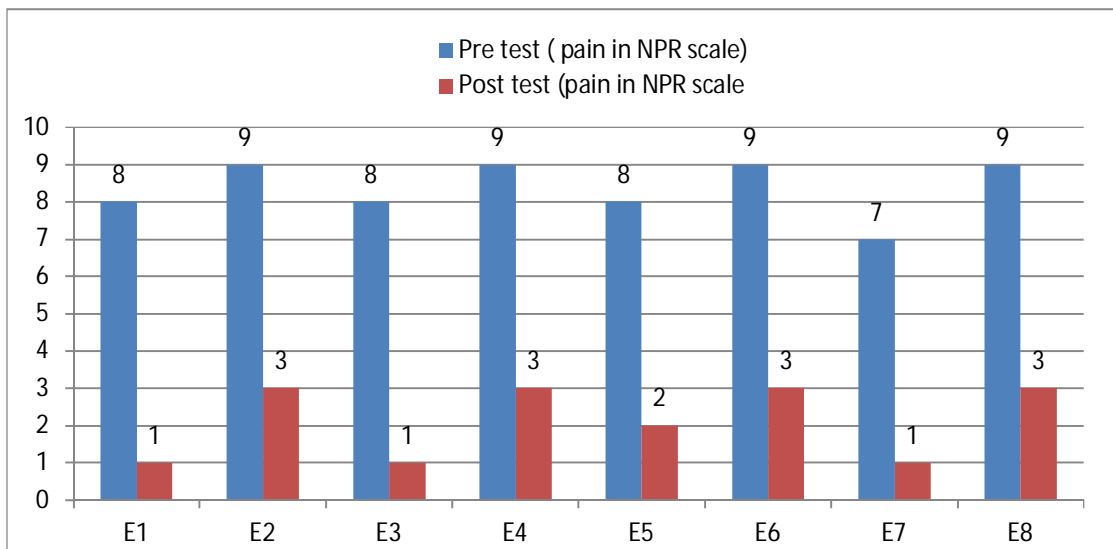
Figure 5: Reduction of pain during activity in experimental group

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	Experimental group			Control group	
Subjects	Post-test pain score	Rank	Subjects	Post-test pain score	Rank
E_1	1	3.5	C_1	1	3.5
E_2	3	13	C_2	1	3.5
E_3	1	3.5	C_3	2	8.5
E_4	3	13	C_4	2	8.5
E_5	2	8.5	C_5	4	16
E_6	3	13	C_6	1	3.5
E_7	1	3.5	C_7	3	13
E_8	3	13	C_8	2	8.5
Total		71	Total		65

Table-4: Reduction of Pain during activity in experimental and control group with rank

Here,

n_1 = the number of the subjects experimental group = 8

n_2 = the number of the subject in control group = 8

T_x = the larger rank total = 71

n_x = the number of the subjects in the condition with larger rank total .That is experimental group = 8

Now U formula:

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

$$= 8 \times 8 + \frac{8(8+1)}{2} - 71$$

$$= 64 + 36 - 71$$

$$= 100 - 71$$

$$= 29$$

The U-value is 29. The critical value of U at $p \leq 0.10$ is 15. Therefore, the result is not significant at $p > 0.10$.

Pain in sitting: In chronic neck pain reduction of pain scores during sitting were differences between pre-test and post-test pain scores for both control group and trial group.
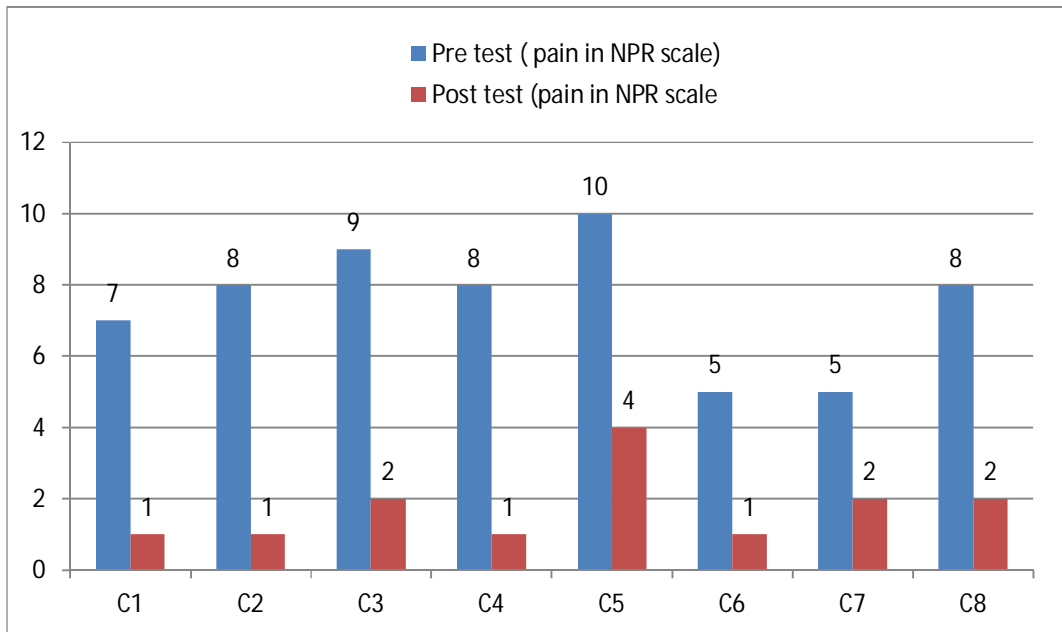
Figure 6: Reduction of pain in sitting in control group
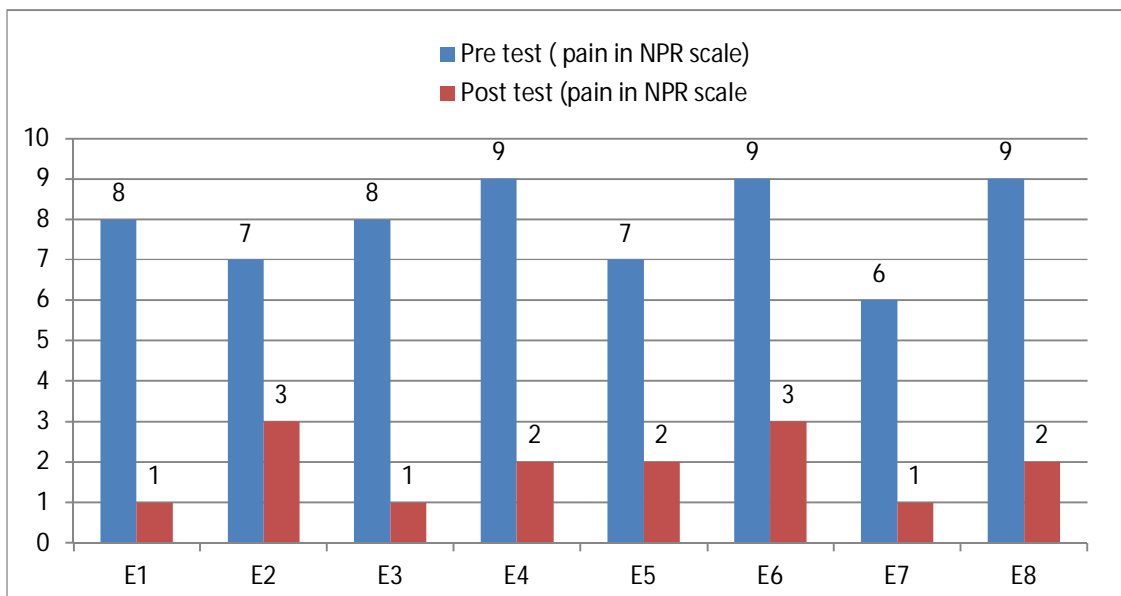
Figure 7: Reduction of pain in sitting in experimental group

Experimental group			Control group		
Subjects	Post-test pain score	Rank	Subjects	Post-test pain score	Rank
E_1	1	4	C_1	1	4
E_2	3	14.5	C_2	1	4
E_3	1	4	C_3	2	10.5
E_4	2	10.5	C_4	1	4
E_5	2	10.5	C_5	4	16
E_6	3	14.5	C_6	1	4
E_7	1	4	C_7	2	10.5
E_8	2	10.5	C_8	2	10.5
Total		72.5	Total		63.5

Table-5: Reduction of Pain in sitting in experimental and control group with rank

Here,

n_1 = the number of the subjects experimental group = 8

n_2 = the number of the subject in control group = 8

T_x = the larger rank total = 72.5

n_x = the number of the subjects in the condition with larger rank total .That is experimental group = 8
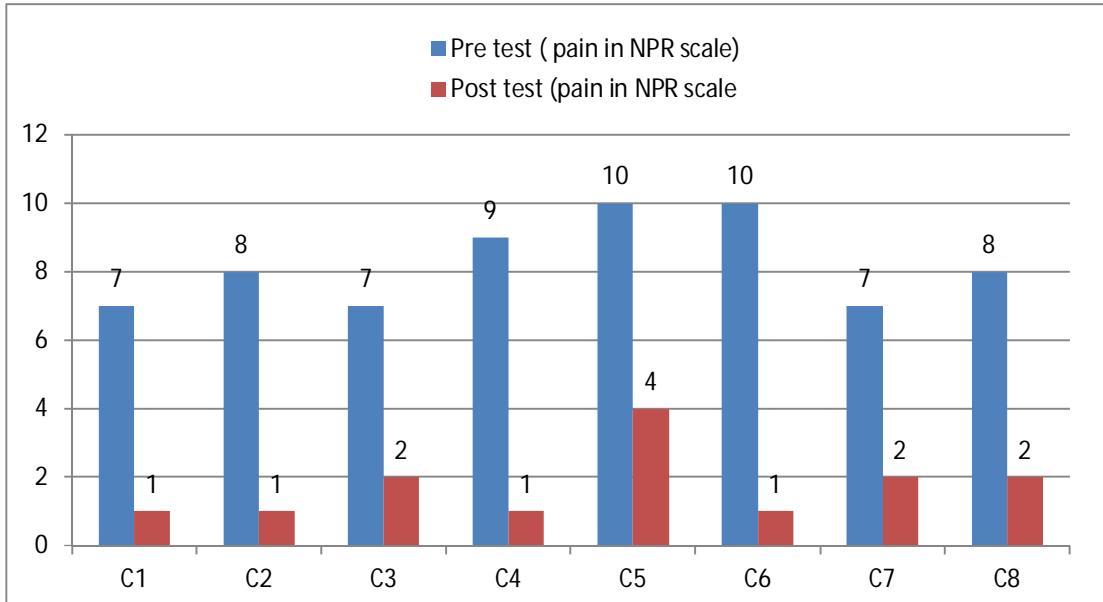
Now U formula:

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

$$= 8 \times 8 + \frac{8(8+1)}{2} - 72.5$$

$$= 64 + 36 - 72.5$$

$$= 100 - 72.5$$

$$= 27.5$$

The U-value is 27.5. The critical value of U at $p \leq 0.10$ is 15. Therefore, the result is not significant at $p > 0.10$.

Pain in standing: In chronic neck pain reduction of pain scores during standing were differences between pre-test and post-test pain scores for both control group and trial group.

Figure 8: Reduction of pain in standing in control group
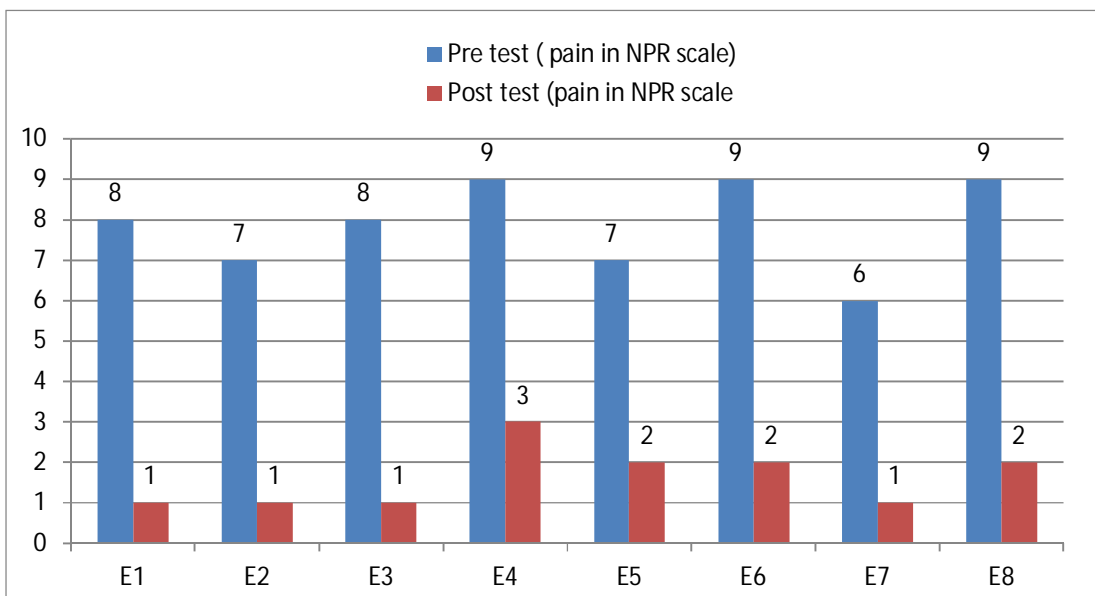
Figure 9: Reduction of pain in standing in experimental group

	Experimental group			Control group	
Subjects	Post-test pain score	Rank	Subjects	Post-test pain score	Rank
E_1	1	3.62	C_1	1	3.62
E_2	1	3.62	C_2	1	3.62
E_3	1	3.62	C_3	2	12
E_4	2	12	C_4	1	3.62
E_5	2	12	C_5	4	16
E_6	2	12	C_6	1	3.62
E_7	1	3.62	C_7	2	12
E_8	2	12	C_8	2	12
Total		62.48	Total	31	66.48

Table-6: Reduction of Pain in standing in experimental and control group with rank

Here,

n_1 = the number of the subjects experimental group = 8

n_2 = the number of the subject in control group = 8

T_x = the larger rank total = 66.48

n_x = the number of the subjects in the condition with larger rank total .That is control group = 8

Now U formula:

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

$$= 8 \times 8 + \frac{8(8+1)}{2} - 66.48$$

$$= 64 + 36 - 66.48$$

$$= 100 - 66.48$$

$$= 33.52$$

The U-value is 33.52. The critical value of U at $p \leq 0.10$ is 15. Therefore, the result is not significant at $p > 0.10$.

Pain in walking: In chronic neck pain reduction of pain scores during walking were differences between pre-test and post-test pain scores for both control group and trial group.
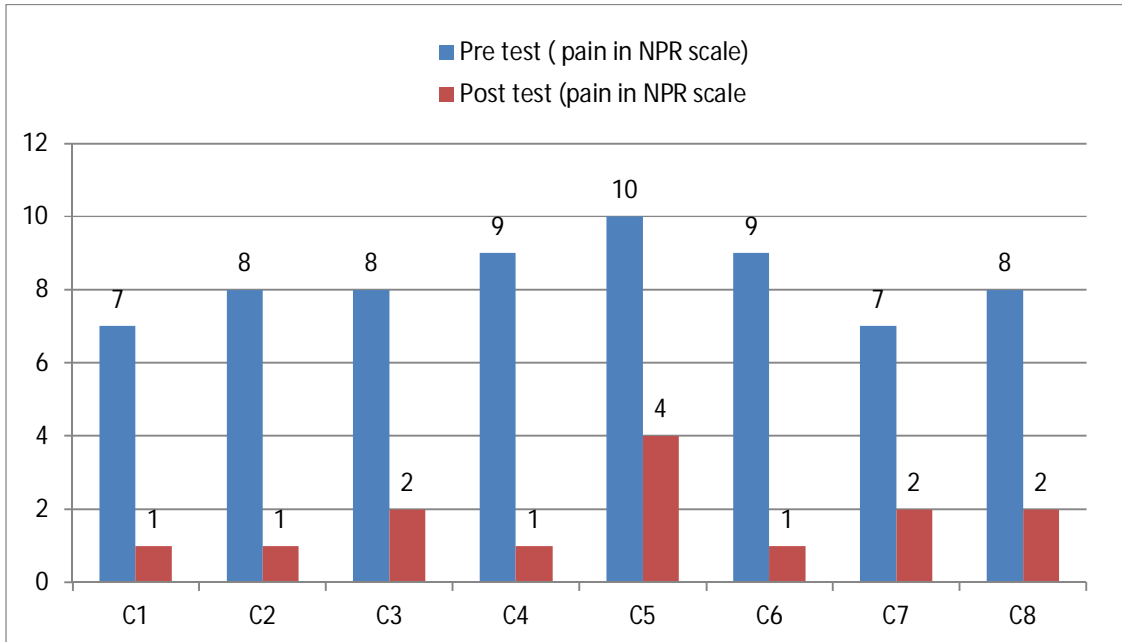
Figure 10: Reduction of pain in walking in control group
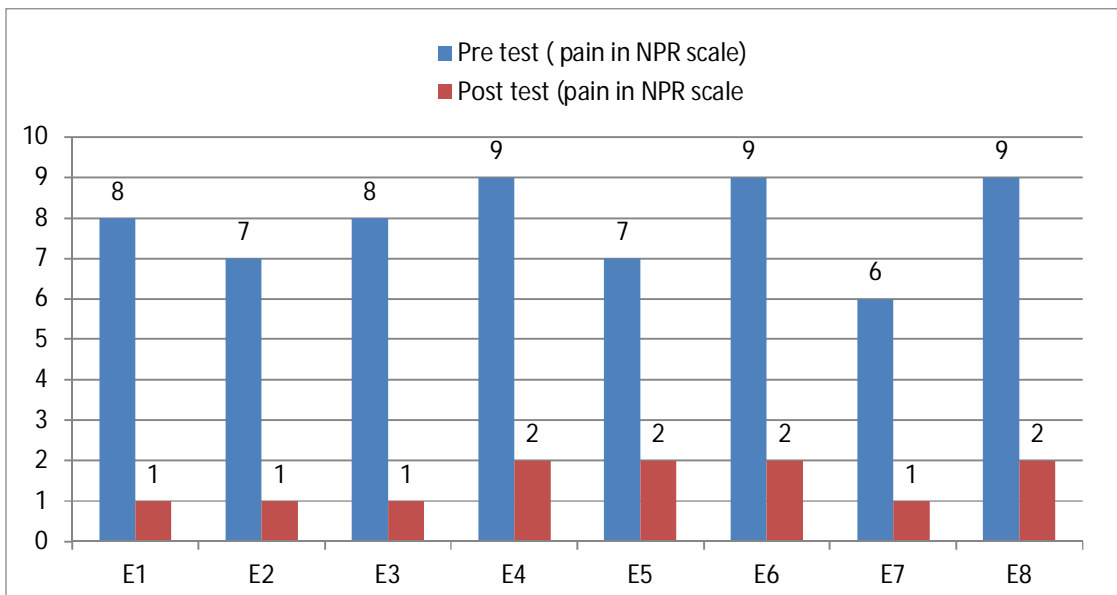
Figure 11: Reduction of pain in walking in experimental group

Experimental group			Control group		
Subjects	Post-test pain score	Rank	Subjects	Post-test pain score	Rank
E_1	1	4.5	C_1	1	4.5
E_2	1	4.5	C_2	1	4.5
E_3	1	4.5	C_3	2	12
E_4	2	12	C_4	1	4.5
E_5	2	12	C_5	4	16
E_6	2	12	C_6	1	4.5
E_7	1	4.5	C_7	2	12
E_8	2	12	C_8	2	12
Total		66	Total	31	70

Table-7: Reduction of Pain during walking in experimental and control group with rank

Here,

n_1 = the number of the subjects experimental group = 8

n_2 = the number of the subject in control group = 8

T_x = the larger rank total = 70

n_x = the number of the subjects in the condition with larger rank total .That is control group = 8

Now U formula:

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

$$= 8 \times 8 + \frac{8(8+1)}{2} - 70$$

$$= 64 + 36 - 70$$

$$= 100 - 70$$

$$= 30$$

The U-value is 30. The critical value of U at p≤ 0.10 is 15. Therefore, the result is not significant at p>0.10.

Pain in sleeping: In chronic neck pain reduction of pain scores during sleeping were differences between pre-test and post-test pain scores for both control group and trial group.
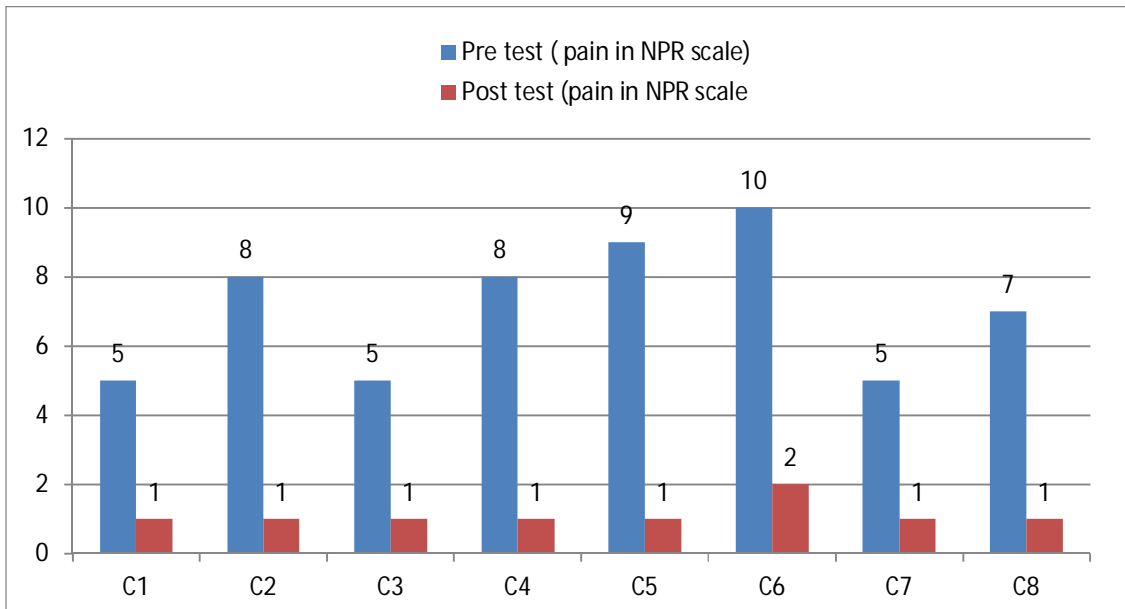
Figure 12: Reduction of pain in sleeping in control group
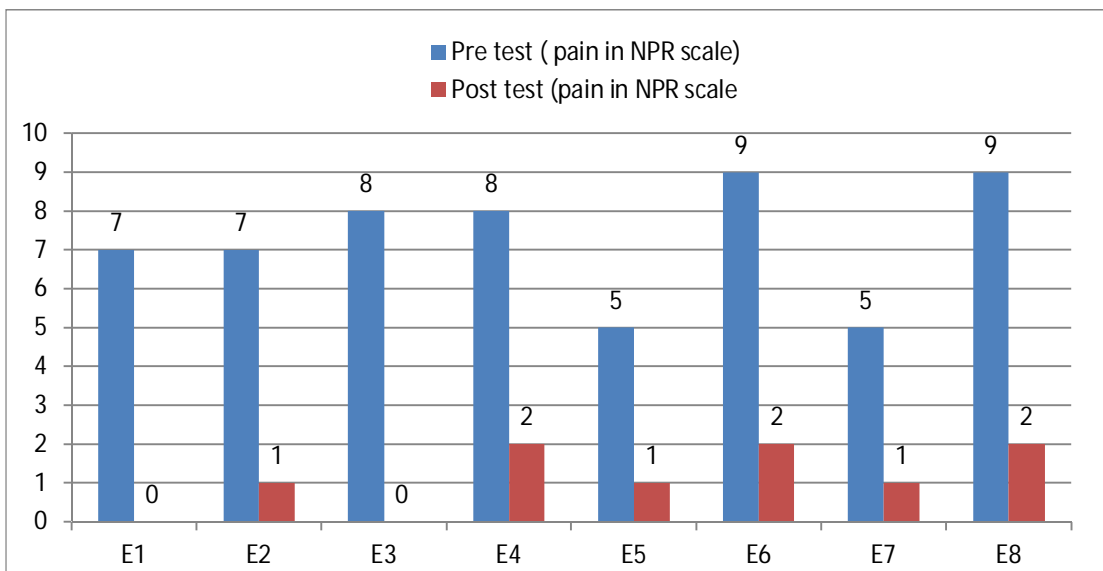
Figure 13: Reduction of pain in sleeping in experimental group

Experimental group			Control group		
Subjects	Post-test pain score	Rank	Subjects	Post-test pain score	Rank
E_1	0	1.5	C_1	1	7.5
E_2	1	7.5	C_2	1	7.5
E_3	0	1.5	C_3	1	7.5
E_4	2	14.5	C_4	1	7.5
E_5	1	7.5	C_5	1	7.5
E_6	2	14.5	C_6	2	14.5
E_7	1	7.5	C_7	1	7.5
E_8	2	14.5	C_8	1	7.5
Total		69	Total	31	67

Table-8: Reduction of pain during sleeping in experimental and control group with rank

Here,

n_1 = the number of the subjects experimental group = 8

n_2 = the number of the subject in control group = 8

T_x = the larger rank total = 69

n_x = the number of the subjects in the condition with larger rank total .That is experimental group = 8

Now U formula:

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

$$= 8\times 8 + \frac{8(8+1)}{2} - 69$$

$$= 64 + 36 - 69$$

$$= 100 - 69$$

$$= 31$$

The U-value is 31. The critical value of U at p≤ 10 is 15. Therefore, the result is not significant at p>0.10.

Pain during neck turning: In chronic neck pain reduction of pain scores during neck turning were differences between pre-test and post-test pain scores for both control group and trial group.
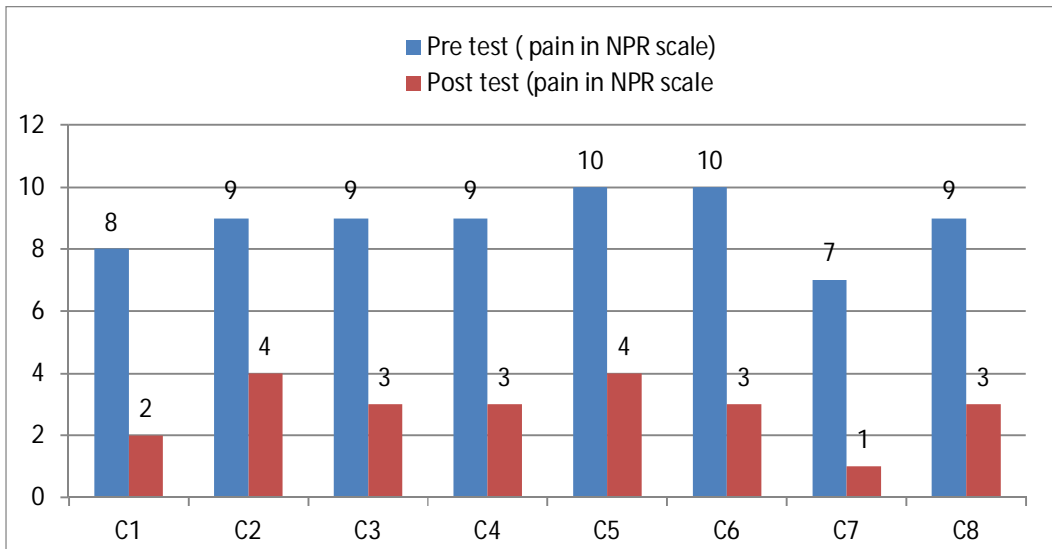
Figure 14: Reduction of pain during neck turning in control group
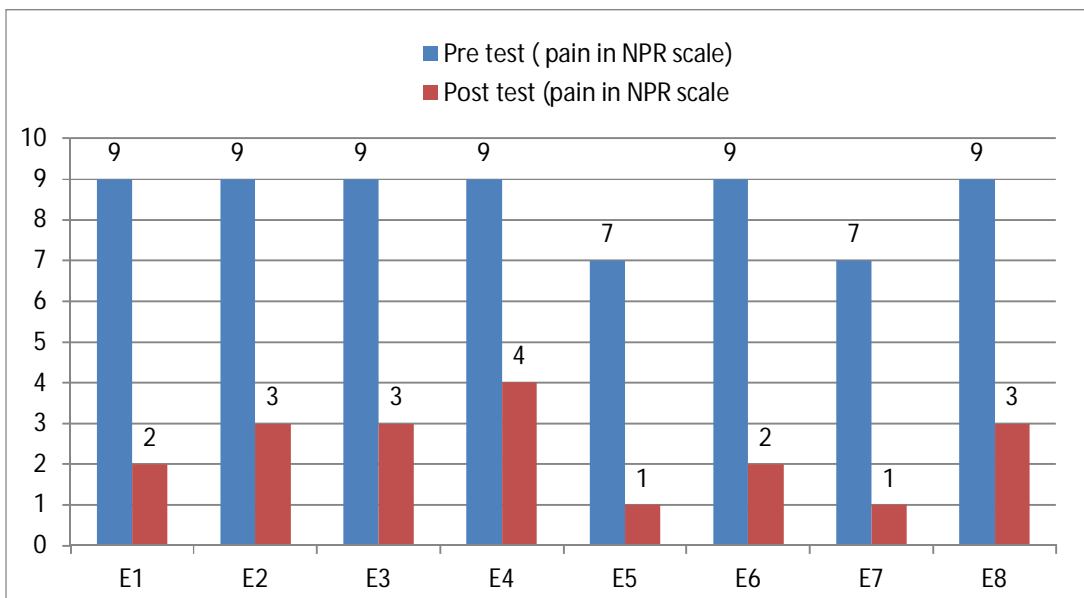
Figure 15: Reduction of pain during neck turning in experimental group

Experimental group			Control group		
Subjects	Post-test pain score	Rank	Subjects	Post-test pain score	Rank
E$_1$	2	8	C $_1$	2	8
E$_2$	3	14	C$_2$	1	2.5
E$_3$	2	8	C$_3$	3	14
E$_4$	3	14	C$_4$	2	8
E$_5$	1	2.5	C$_5$	3	14
E$_6$	2	8	C$_6$	2	8
E$_7$	1	2.5	C$_7$	1	2.5
E$_8$	3	14	C$_8$	2	8
Total		71	Total	31	65

Table-9: Reduction of Pain during neck turning in experimental and control group with rank

Here,

n_1 = the number of the subjects experimental group = 8

n_2 = the number of the subject in control group = 8

T_x = the larger rank total = 71

n_x = the number of the subjects in the condition with larger rank total .That is experimental group = 8

Now U formula:

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

$$= 8 \times 8 + \frac{8(8+1)}{2} - 71$$

$$= 64 + 36 - 71$$

$$= 100 - 71$$

$$= 29$$

The U-value is 29. The critical value of U at p≤ 0.10 is 15. Therefore, the result is not significant at p>0.10.

Pain during neck flexion: In chronic neck pain reduction of pain scores during neck flexion were differences between pre-test and post-test pain scores for both control group and trial group.
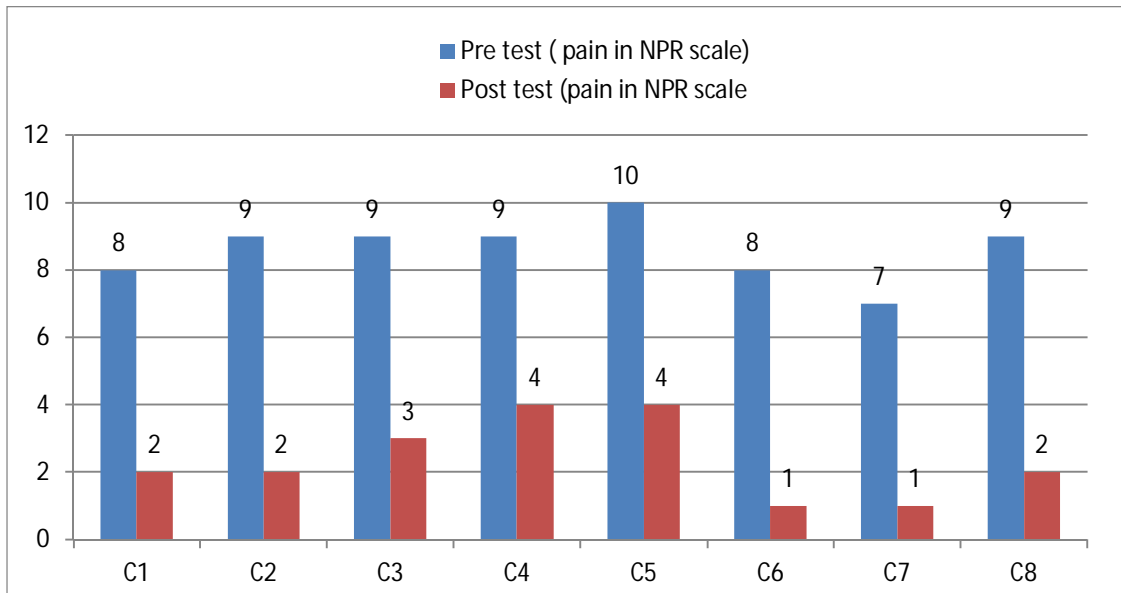
Figure 16: Reduction of pain during neck flexion in control group
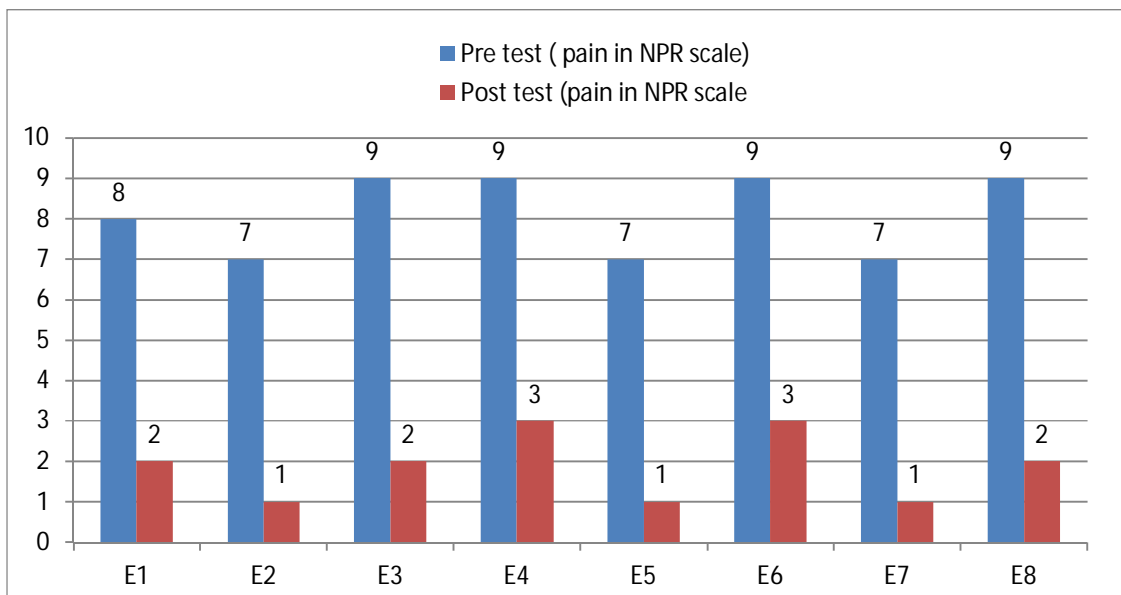
Figure 17: Reduction of pain during neck flexion in experimental group

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Experimental group			Control group		
Subjects	Post-test pain score	Rank	Subjects	Post-test pain score	Rank
E_1	2	11.5	C_1	1	5
E_2	1	5	C_2	1	5
E_3	1	5	C_3	3	15
E_4	3	15	C_4	1	5
E_5	1	5	C_5	3	15
E_6	2	11.5	C_6	1	5
E_7	1	5	C_7	1	5
E_8	2	11.5	C_8	2	11.5
Total		69.5	Total		66.5

Table-10: Reduction of Pain during neck flexion in experimental and control group with rank

Here,

n_1 = the number of the subjects experimental group = 8

n_2 = the number of the subject in control group = 8

T_x = the larger rank total = 69.5

n_x = the number of the subjects in the condition with larger rank total .That is experimental group = 8

Now U formula:

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

$$= 8 \times 8 + \frac{8(8+1)}{2} - 69.5$$

$$= 64 + 36 - 69.5$$

$$= 100 - 69.5$$

$$= 30.5$$

The U-value is 30.5. The critical value of U at p≤ 0.10 is 15. Therefore, the result is not significant at p>0.10.

Pain reduction in control group

Subjects		Mean Difference of Pain Reduction in Control group									
		Rest		working		sitting		standing		Walking	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
C1		7	1	7	1	7	1	7	1	7	1
C2		7	1	9	1	8	1	8	1	8	1
C3		7	1	9	2	9	2	7	2	8	2
C4		8	1	9	2	8	1	9	1	9	1
C5		10	2	10	4	10	4	10	4	10	4
C6		7	1	8	1	5	1	10	1	9	1
C7		8	1	10	3	5	2	7	2	7	2
C8		7	1	8	2	8	2	8	2	8	2
Total	**8**	61	9	70	16	60	14	66	14	66	14
Mean		7.63	1.13	8.75	2	7.5	1.75	8.25	1.75	8.25	1.75
Mean difference		**6.5**		**6.75**		**5.75**		**6.5**		**6.5**	

Subjects		Mean Difference of Pain Reduction in Control group					
		sleeping		Neck rotation		Neck flexion	
		Pre	Post	Pre	Post	Pre	Post
C1		5	1	8	2	8	1
C2		8	1	9	1	9	1
C3		5	1	9	3	9	3
C4		8	1	9	2	9	1
C5		9	1	10	3	10	3
C6		10	2	10	2	8	1
C7		5	1	7	1	7	1
C8		7	1	9	2	9	2
Total	**8**	57	9	76	16	69	13
Mean		7.13	1.13	9.5	2	8.6	1.63
Mean difference		**6**		**7.5**		**6.97**	

Subjects		Mean Difference of Pain Reduction in Experimental group									
		Rest		Working		sitting		Standing		Walking	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
E1		7	1	8	1	8	1	8	1	8	1
E2		7	1	9	3	7	3	7	1	7	1
E3		7	1	8	1	8	1	8	1	8	1
E4		8	1	9	3	9	2	9	2	9	2
E5		7	1	8	2	7	2	7	2	7	2
E6		9	2	9	3	9	3	9	2	9	2
E7		7	1	7	1	6	1	6	1	6	1
E8		8	2	9	3	9	2	9	2	9	2
Total	8	60	10	67	17	63	15	63	12	63	12
Mean		7.5	1.25	8.38	2.13	7.88	1.88	7.88	1.5	7.88	1.5
Mean difference		**6.25**		**6.25**		**6**		**6.38**		**6.38**	

Subjects	Mean Difference of Pain Reduction in Experimental group					
	Sleeping		Neck rotation		Neck flexion	
	Pre	Post	Pre	Post	Pre	Post
E1	7	0	9	2	8	2
E2	7	1	9	3	7	1
E3	8	0	9	2	9	1
E4	8	2	9	3	9	3
E5	5	1	7	1	7	1
E6	9	2	9	2	9	2
E7	5	1	7	1	7	1
E8	9	2	9	3	9	2
Total **8**	58	9	68	17	65	13
Mean	7.25	1.13	8.5	2.13	8.13	1.63
Mean difference	**6.12**		**6.37**		**6.5**	

Name of the variables	Experimental Group (Mean Pain reduction)	Control group (Mean Pain reduction)
Pain at rest	6.5	6.25
Pain during working	6.75	6.25
Pain in sitting	5.75	6
Pain in standing	6.5	6.38
Pain in walking	6.5	6.38
Pain in sleeping	6	6.12
Pain during neck rotation	7.5	6.37
Pain during neck flexion	6.97	6.5

Table 11: Comparison of mean difference of pain reduction in both groups
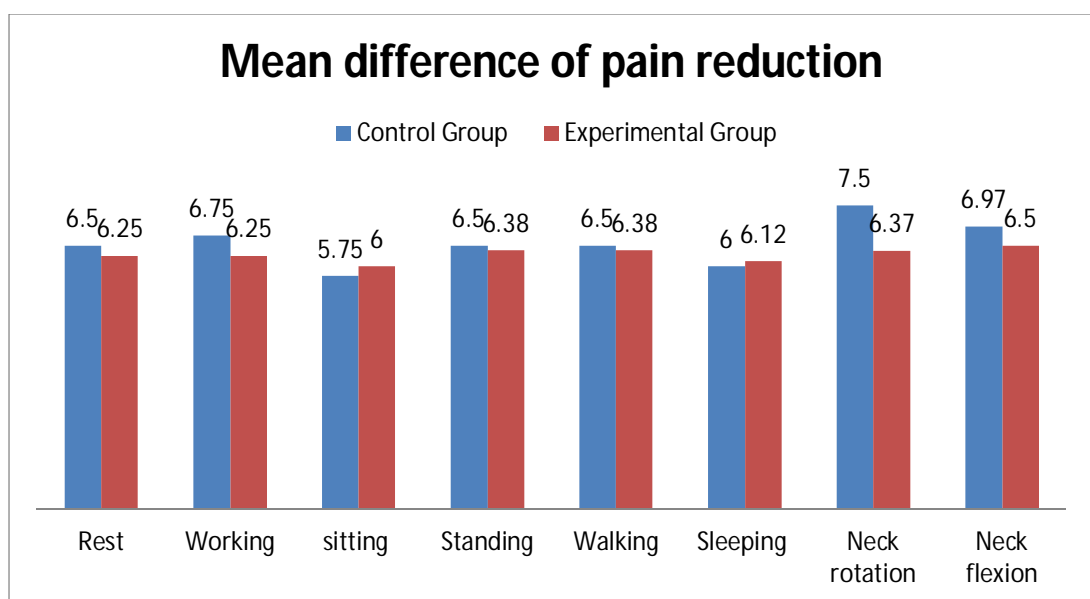
Figure 18: Mean difference of pain reduction

Improvement of ROM

Mean difference of Improvement of Range of motion between pre-test and post-test in conventional physiotherapy with educational booklet and only conventional physiotherapy group.

Name of the variables	Conventional physiotherapy with educational booklet group	Only conventional physiotherapy group
Passive flexion	10.625	6.25
Passive extension	10	7.5
Passive rotation right	10	8.125
Passive rotation left	11.25	8.125

Table 12: Mean difference of Improvement of ROM between pre-test and post-test in experimental and control group
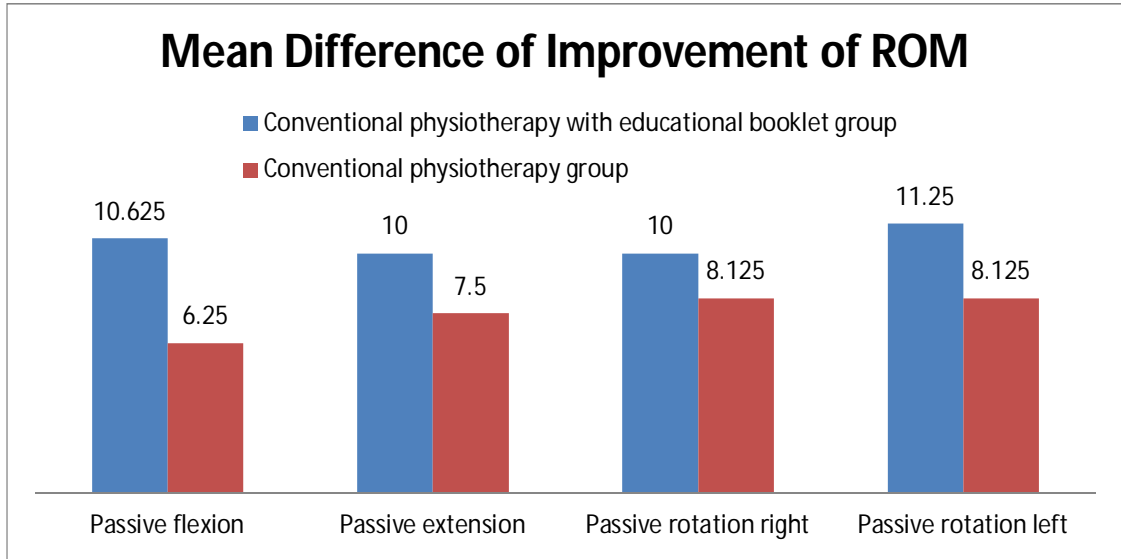
Figure 19: Mean difference of Improvement of ROM between pre-test and post- test in experimental and control group.

Range of Movement in Passive flexion: Educational booklet with conventional physiotherapy treatment group and only conventional physiotherapy treatment group for Improvement of ROM in passive flexion were differences between pre-test and post-test pain scores.

Conventional physiotherapy with Educational Booklet			Only Conventional physiotherapy group		
Subjects	ROM in Passive flexion (X_1)	X_1^2	Subjects	ROM in passive flexion (X_2)	X_2^2
E_1	15	225	C_1	5	25
E_2	10	100	C_2	10	100
E_3	10	100	C_3	5	25
E4	10	100	C4	5	25
E_5	10	100	C_5	5	25
E_6	15	225	C_6	5	25
E_7	10	100	C_7	10	100
E8	5	25	C8	5	25
	$\sum X_1 = 85$	$\sum X_1^2 = 975$		$\sum X_2 = 50$	$\sum X_2^2 = 350$

$\bar{X}_1 = 10.625$

$\sum X_1^2 = 975$

$(\sum X_1)^2 = 7225$

$n_1 = 8$

$\bar{X}_2 = 6.25$

$\sum X_2^2 = 350$

$(\sum X_2)^2 = 2500$

$n_2 = 8$

Calculating the degree of freedom from the formula

df = (n_1-1) + (n_2-1)

  = (8 -1) + (8 - 1) =14

Now 't' formula-

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\left[\sqrt{\frac{\left(\Sigma x_1{}^2 - \frac{(\Sigma x_1)^2}{n_1}\right) + \left(\Sigma x_2{}^2 - \frac{(\Sigma x_2)^2}{n_2}\right)}{(n_1 - 1) + (n_2 - 1)}} \times \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}\right]}$$

$$t = \frac{10.625 - 6.25}{\left[\sqrt{\frac{975 - \frac{7225}{8} + 350 - \frac{2500}{8}}{(8-1) + (8-1)}} \times \sqrt{\left(\frac{1}{8} + \frac{1}{8}\right)}\right]}$$

t= 3.125

Range of Movement in Passive extension: Educational booklet with conventional physiotherapy treatment group and only conventional physiotherapy treatment group for Improvement of ROM in passive extension were differences between pre-test and post-test pain scores.

Conventional physiotherapy with Educational Booklet			Only Conventional physiotherapy group		
Subjects	ROM in Passive extension (X_1)	X_1^2	Subjects	ROM in Passive extension (X_2)	X_2^2
E_1	15	225	C_1	5	25
E_2	10	100	C_2	10	100
E_3	15	225	C_3	10	100
E4	10	100	C4	10	100
E_5	10	100	C_5	5	25
E_6	10	100	C_6	5	25
E_7	5	25	C_7	10	100
E8	5	25	C8	5	25
	$\sum X_1 = 80$	$\sum X_1^2 = 900$		$\sum X_2 = 60$	$\sum X_2^2 = 500$

$\bar{X}_1 = 10$

$\sum X_1^2 = 900$

$(\sum X_1)^2 = 6400$

$n_1 = 8$

$\bar{X}_2 = 7.5$

$\sum X_2^2 = 500$

$(\sum X_2)^2 = 3600$

$n_2 = 8$

Calculating the degree of freedom from the formula

df = (n_1-1) + (n_2-1)

   = (8 -1) + (8 - 1) =14

Now 't' formula-

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\left[\sqrt{\frac{\left(\Sigma x_1{}^2 - \frac{(\Sigma x_1)^2}{n_1}\right) + \left(\Sigma x_2{}^2 - \frac{(\Sigma x_2)^2}{n_2}\right)}{(n_1-1)+(n_2-1)}} \times \sqrt{\left(\frac{1}{n_1}+\frac{1}{n_2}\right)} \right]}$$

$$t = \frac{10-7.5}{\left[\sqrt{\frac{900-\frac{6400}{8}+500-\frac{3600}{8}}{(8-1)+(8-1)}} \times \sqrt{\left(\frac{1}{8}+\frac{1}{8}\right)} \right]}$$

t= 1.53

Range of Movement in Passive rotation right: Educational booklet with conventional physiotherapy treatment group and only conventional physiotherapy treatment group for Improvement of ROM in passive rotation right were differences between pre-test and post-test pain scores.

Conventional physiotherapy with Educational Booklet group			Only Conventional physiotherapy group		
Subjects	ROM in Passive rotation right (X_1)	X_1^2	Subjects	ROM in Passive rotation right (X_2)	X_2^2
E_1	10	100	C_1	5	25
E_2	10	100	C_2	5	25
E_3	10	100	C_3	10	100
E4	10	100	C4	10	100
E_5	15	225	C_5	10	100
E_6	5	25	C_6	10	100
E_7	5	25	C_7	10	100
E8	15	225	C8	5	25
	$\sum X_1 = 80$	$\sum X_1^2 = 900$		$\sum X_2 = 65$	$\sum X_2^2 = 575$

$\overline{X_1} = 10$

$\sum X_1^2 = 900$

$(\sum X_1)^2 = 6400$

$n_1 = 8$

$X_2 = 8.125$

$\sum X_2^2 = 575$

$(\sum X_2)^2 = 4225$

$n_2 = 8$

Calculating the degree of freedom from the formula

df $\quad = (n_1-1) + (n_2-1)$

$\qquad = (8 -1) + (8 - 1) = 14$

Now 't' formula-

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\left[\sqrt{\frac{\left(\Sigma x_1{}^2 - \frac{(\Sigma x_1)^2}{n_1}\right) + \left(\Sigma x_2{}^2 - \frac{(\Sigma x_2)^2}{n_2}\right)}{(n_1-1)+(n_2-1)}} \times \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}\right]}$$

$$t = \frac{10 - 8.125}{\left[\sqrt{\frac{900 - \frac{6400}{8} + 575 - \frac{4225}{8}}{(8-1)+(8-1)}} \times \sqrt{\left(\frac{1}{8} + \frac{1}{8}\right)}\right]}$$

t= 1.16

Range of Movement in Passive rotation left: Educational booklet with conventional physiotherapy treatment group and only conventional physiotherapy treatment group for Improvement of ROM in passive rotation left were differences between pre-test and post-test pain scores.

Conventional physiotherapy with Educational Booklet			Only Conventional physiotherapy group		
Subjects	ROM in Passive rotation left (X_1)	X_1^2	Subjects	ROM in Passive rotation left (X_2)	X_2^2
E_1	10	100	C_1	5	25
E_2	15	225	C_2	5	25
E_3	10	100	C_3	10	100
E4	10	100	C4	5	25
E_5	10	100	C_5	10	100
E_6	10	100	C_6	15	225
E_7	10	100	C_7	5	25
E8	15	225	C8	10	100
	$\sum X_1 = 90$	$\sum X_1^2 = 1050$		$\sum X_2 = 65$	$\sum X_2^2 = 625$

$\overline{X_1} = 11.25$

$\sum X_1^2 = 1050$

$(\sum X_1)^2 = 8100$

$n_1 = 8$

$X_2 = 8.125$

$\sum X_2^2 = 625$

$(\sum X_2)^2 = 4225$

$n_2 = 8$

Calculating the degree of freedom from the formula

df   = (n_1-1) + (n_2-1)

     = (8 -1) + (8 - 1) =14

Now 't' formula-

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\left[\sqrt{\frac{\left(\Sigma x_1{}^2 - \frac{(\Sigma x_1)^2}{n_1}\right) + \left(\Sigma x_2{}^2 - \frac{(\Sigma x_2)^2}{n_2}\right)}{(n_1-1)+(n_2-1)}} \times \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)} \right]}$$

$$t = \frac{11.25 - 8.125}{\left[\sqrt{\frac{1050 - \frac{8100}{8} + 625 - \frac{4225}{8}}{(8-1)+(8-1)}} \times \sqrt{\left(\frac{1}{8} + \frac{1}{8}\right)} \right]}$$

t= 2.02

Variables in the study statistically significance at the following level of significance:

No	Variables	Observed 't' value	Tabulated 't' value	Observed P value	
1.	ROM in passive flexion	3.125	2.977	<.01	Significant
2.	ROM in passive extension	1.53	1.345	<.20	Not Significant
3.	ROM in passive rotation right	1.16	>1.345	>.20	Not Significant
4.	ROM in passive rotation left	2.02	1.761	<.10	Not Significant

Table 5: Level of significance indifferent variables

CHAPTER-V	DISCUSSION

The purpose of this study was to evaluate the effectiveness of educational booklet with conventional physiotherapy compare to only conventional physiotherapy for chronic neck pain. In this experimental study 16 patients with chronic neck pain were randomly assigned to the experimental group and to the control group. Among these 16 patients, 8 patients were included in the experimental group who received an educational booklet with conventional physiotherapy and the rest of the 8 patients were included in the control group, who received conventional physiotherapy only. Each group attended for 6 sessions of treatment within one month in the physiotherapy outdoor department of CRP Savar in order to demonstrate the improvement of the neck pain and neck flexion, extension and rotation ROM .The outcome was measured by using Numeric Pain Rating scale (NPR) for pain intensity in different functional position, and goniometer for measuring neck ROM.

Mean age of the participants of experimental and control group were consequence 41 & 37 years. Among them almost 25% (n=4) were male and about 75% (n=10) were female.

In Experimental group, Mean difference of reduction of sitting pain was 6 which were 0.25 more than Mean difference in control group. Also there was improvement of pain reduction in mean difference during sleeping which was 0.12 more than control group. But the result of U test showed that there was no improvement in case of resting pain (p>0.10), during activity pain (p>0.10), during sitting pain (p>0.10), during standing pain (p>0.10), during walking pain (p>0.10), during sleeping pain (p>0.10), during neck turning pain (p>0.10) and during neck flexion pain (p>0.10).

The statistical outcome was significant in case of ROM of neck flexion (p<0.05).But it has not been found statistically improvement in case of ROM of neck extension and neck turning.

A randomized control trial showed that among the 181 participants, control group were received physiotherapy with booklet and experimental group were received physiotherapy and face to face advice with the booklet for chronic back pain and there were no difference of the primary outcomes (Rantonen et al., 2014). On the other hand a

qualitative result showed that booklet was easy to read, understandable, believable and quantitative study showed a significant statistical improvement in whiplash injury (Mcclune et al. 2003).

In this Research, Researcher found significant improvement in reduction of pain during sitting position in trail group than the control group. There is also found improvement in reduction of pain during sleeping. It also found that the neck flexion ROM was increased more significantly than the control group. There is improvement of ROM in extension but it is not statistically significant.

CHAPTER-VI	CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The result of this experimental study have identified that there was no statistically significant difference between educational booklet with conventional physiotherapy group and only conventional physiotherapy group. That is indicated that educational booklet with conventional physiotherapy is not more effective than the conventional physiotherapy alone. So this study accepts the null hypothesis. But that doesn't mean educational booklet with conventional physiotherapy is ineffective. Because there was gross improvement in pain and ROM but which was not statistically significant and may be the reason behind this failure was unable to make the patient understood about the importance of educational booklet with in a shorten period of time.

Educational booklet is used along with conventional physiotherapy that aims to reduce pain, increase functional activity and also increase range of motion of neck, to facilitate rehabilitation program. It is helpful for better understanding of usual advice.

6.2 Recommendations

As a consequence of this research it is recommended to do further study including comparison of the conventional physiotherapy and educational booklet with conventional physiotherapy alone to assess the effectiveness of these interventions with-

- Double blinding procedure.
- It is recommended to do further study with more number of subjects and with a longer time frame.
- It is also recommended to include the functional outcome assessment of patient and to identify the average number of sessions that are needed to be discharged from treatment to validate the treatment technique.
- Educational booklet with educational classes for better understanding.

REFERENCES

➢ Bandy, W.D., Irion, J. M., and Briggler, M., (2000) The effect of time and frequency of static stretching on flexibility of the hamstring muscles. Physical Therapy, 77:1090-1096.

➢ Barbuto, J.P., White, G.L., Porucznik, C.A., and Holmes, E.B., (2008). Chronic pain: second, do no harm. American Journal of Physical Medicine & Rehabilitation, 87(1):78–83.

➢ Bangladesh Bureau of Statistics, (2011). Bangladesh census [Online]. Available: http://www.bangbureau.com [Accessed on 28 December 2014].

➢ Chan, H., Zhang, L., Wang, Z., Yang, K.H., and King, A.I., (2014). Biomechanics of the Neck. [e-book]. Available: <http://www.intechopen.com/books/theoretical biomechanics/biomechanics-of-the-neck [Accessed on 12 January 2015].

➢ Cheng, Y.H., and Huang, G.C., (2014). Efficacy of massage therapy on pain and dysfunction in patients with neck pain : A systematic review and meta-analysis. Evidence-Based Complementary and Alternative Medicine, 2014(1):1-13.

➢ Childs, J.D., Cleland, J.A., Elliott, J.M., Teyhen, D.S., Wainner, E.S., Whitman, J.M., Sopky, B.J., and Godge, J.J., (2008). Neck pain: clinical practice guidelines linked to the international classification of functioning, disability, and health from the orthopaedic section of the American Physical Therapy Association. Journal of Orthopaedic & Sports Physical Therapy, 38 (9):1-34.

➢ Clare, H.A., Adams, R., and Maher, C.G., (2004a). A systematic review of efficacy of McKenzie therapy for spinal pain. Australian Journal of Physiotherapy, 50(4):209–216.

➢ Clare, H.A., Adams, R., and Maher, C.G., (2004b). Reliability of the McKenzie spinal pain classification using patient assessment forms. Physiotherapy, 90 (2004):114–119.

➢ Clare, H.A., Adams, R., and Maher, C.G., (2005). Reliability of McKenzie classification of patients with cervical or lumbar pain. Journal of Manipulative and Physiological Therapeutics, 28 (2):122–127.

➢ Cleland, J.A., childs, J.D., and Whitman, J.M., (2008). Psychometric properties of the neck disability index and numeric pain rating scale in patients with mechanical. Archive of Physical Medicine and Rehabilitation, 89 (January):69-74.

➢ Cunha, A.C.V., Burke, T.N., Franca, F.J.R., and Marques, A.P., (2008). Effect of global posture reeducation and static stretching on pain, range of motion, and quality of life in women with chronic neck pain: A randomized clinical trial. Clinical Science, 63 (6):763-770.

➢ Depoy, E., and Gitlin, L.N., (2011). Introduction to research: understanding and applying multiple strategies, 4th ed., St. Louis: Elsevier.

➢ English Dictionary, (2014). Nerve ending [Online]. USA : Collins English Dictionary. Available :
http://www.collinsdictionary.com/dictionary/english/nerve-ending [Accessed on 28 december 2014].

➢ Foster, N.E., Thompson, K.A., Baxter, G.D., and Allen, J.M., (2000). Management of non-specific low back pain by physiotherapists in Britain and Ireland: A descriptive questionnaire of current clinical practice. Spine, 24:1332-1342.

➢ Goode, A.P., Freburger, J., and Carey, T., (2010). Prevalence, practice patterns, and evidence for chronic neck pain. Arthritis care & Research, 62(11):1594–1601.

➢ Graham, G.G., and Scott, K.F., (2005). Mechanism of action of paracetamol. American Journal of Therapeutics, 12 (1):46–55.

➢ Guindon, J., Walczak, J.S., and Beaulieu, P., (2007). Recent advances in the pharmacological management of pain. Drugs, 67(15):2121–2133.

➢ Hoy, D.G., Protani, M., De, R., and Buchbinder, R., (2011). The epidemiology of neck pain. Best Practice & Research Clinical Rheumatology, 24(2010):783–792.

- IASP, (1994). IASP Taxonotomy [Online]. USA: International Association of the study of Pain. Available: http://www.iasp-pain.org [Accessed on 28 october 2014].

- Leonard, J.H., Choo, C.P., Manaf, M.R.A., Isa, Z.M., Nordin, N.A.M., and Das, S., (2009). Development and evaluation of neck pain and functional limitation scale: A validation study in the Asian context. Indian Journal of Medical Science, 63(10):445-454.

- Linder, A., Olsen, S., Eriksson, J., Svensson, M.Y., and Carlsson, A., (2012). Influence of gender, height, weight, age, seated position and collision site related to neck pain symptoms in rear end impacts. International Research Council on the Biomechanics of Injury, 35:235-248.

- Manchikanti, L., Falco, F.J.E., Diwan, S., Hirsch, J.A. and Smith, H.S., (2013). Cervical radiculopathy pain: The role of interlaminar and transforaminal epidural injection [Online]. New York : Springer Link. Available: http://link.springer.com [Accessed on 20 October 2014].

- Mantyselka, P., Kautiainen, H., and Vanhala, M., (2010). Prevalence of neck pain in subjects with metabolic syndrome - a cross-sectional population-based study. BMC Musculoskeletal Disorders, 11(171):1471-2474.

- Mcclune, T., Burton, A.K., and Waddell, G., (2003). Evaluation of an evidence based patient educational booklet for management of whiplash associated disorders. Emergency Medicine Journal, 20:514-517.

- Moffett, J., and Mclean, S., (2006). The role of physiotherapy in the management of non-specific back pain and neck pain. Rheumatology, 45:371–378.

- Panel, P., (2001). Evidence-based clinical practice guidelines on selected rehabilitation interventions for neck pain. Physical Therapy, 81:1701-1717.

- Perl, E.R., (1971). Is pain a specific sensation? Journal of Psychiatric research, 8:273-287.

- Petersen, T., Kryger, P., Ekdahl, C., Olsen, S., and Jacobsen, S., (2002). The effect of Mckenzie therapy as compared with that of intensive strengthening training for the treatment of patients with subacute or chronic neck pain: A randomized control trial. Spine, 27(5):1702-1709.

- Physiopedia , (2013) . Cervical Radiculopathy [Online]. UK: Physiopedia. Available: http://www.physio-pedia.com [Accessed on 5 November, 2014].

- Rantonen, J., Vehtari, A., Karppinen, J., Luoto, S., Viikari-Juntura, E., Hupli, M., Malmivaara, A., and Taimela, S., (2014). Face-to-face information combined with a booklet versus a booklet alone for treatment of mild low-back pain: a randomized controlled trial. Scandinavian Journal of Work Environment and Health, 40 (2):156-166.

- Rao, P.N.P., Knaus, E.E., Road, T.P., and Jolla, L., (2008). Evolution of nonsteroidal anti-Inflammatory cyclooxygenase (COX) inhibition and beyond drugs (NSAIDs). Journal of Pharmacy and Pharmaceutical Science, 11(2):81–110.

- Sabeen, F., Bashir, M.S., Hussain, S.I., and Ehsan, S., (2013). Prevalance of neck pain in computer users. Annals, 19(2):137–143.

- Sberman, K.J., Cook, A.J., Wellman, R.D., Hawkes, R.J., Kabn, J.R., Deyo, R.A., and Cberkin, D.C., (2014). Five- week outcomes from a dosing trial of therapeutic massage for chronic neck pain. Annals of Family Medicine, 12 (2):112-120.

- WebMD, (2014). Pain Types and Classification [Online]. USA: WebMD. Available: http://www.webmd.com/pain-management/guide/pain-types-and-classifica [accessed on 28 December 2014].

- World Health Organization: WHO methods and data sources for global burden of disease estimates 2000-2011. Department of Health Statistics and Information Systems WHO, Geneva, 2013.

<center>সম্মতিপত্র</center>

আসসালামুআলাইকুম/ নমস্কার। আমার নাম রোমেছা নাছির। আমি বাংলাদেশ হেলথ প্রফেশনস ইনস্টিটিউট এর ফিজিওথেরাপী চতুর্থ বর্ষের ছাত্রী। আমি এই গবেষণাটি ব্যাচেলর অব সায়েন্স ইন ফিজিওথেরাপী ডিগ্রির পরিপূর্ণতার জন্য করছি। আমার গবেষণার নাম – ঘাড় ব্যথায় শিক্ষণীয় বই এর কার্যকারিতা।

এই গবেষণার মাধ্যমে আমি জানতে পারবো - ঘাড় ব্যথায় শিক্ষণীয় বই এর কার্যকারিতা। এই জন্য আমার ঘাড় ব্যথার রোগীদের থেকে প্রয়োজনীয় তথ্য জানতে হবে।

গবেষণার ক্ষেত্র অনুযায়ী, আপনি এই গবেষণায় অন্তর্ভুক্তির যোগ্যতা অর্জন করেছেন। আমি আপনাকে এই গবেষণায় অংশ গ্রহনের আমন্ত্রন জানাচ্ছি। আমি একটি নির্দিষ্ট ফলাফল জানার চেষ্টা করছি - ঘাড় ব্যথায় শিক্ষণীয় বই এর কাযকারীতায়" যে সব চিকিৎসা পদ্ধতি আপনার উপর প্রয়োগ করা হবে তা সম্পূর্ণ নিরাপদ এবং নিশ্চিত যে কোন ক্ষতি সাধন করবে না।

আমি আপনার সাথে বেশ কয়েকবার দেখা করব। আপনার অংশ গ্রহন হবে ঐচ্ছিক। এই গবেষণায় যে কোন মুহূর্তে আপনি আপনার সম্মতি দিতে পারেন কিংবা অংশ গ্রহন থেকে বিরত থাকতে পারেন

আপনার যদি এ গবেষণা সম্পর্কে কোন জিজ্ঞাসা থাকে তবে অনুগ্রহপূর্বক যোগাযোগ করতে গবেষক রোমেছা নাছির অথবা সোহরাব হোসেন , সহযোগী অধ্যাপক ফিজিওথেরাপি, বি এইচ পি আই এবং হেড অফ প্রোগ্রামস, সি আর পি, সাভার, ঢাকা-১৩৪৩।

শুরু করার পূর্বে আপনার কি কোন প্রশ্ন আছে?

আমি কি শুরু করতে পারি?

হ্যাঁ ☐   না ☐

প্রশ্নকর্তার স্বাক্ষর ....

আমি .... এই সম্মতি পত্রটি পড়েছি ও বুঝেছি। আমি স্বেচ্ছায় এই গবেষণায় অন্তর্ভুক্ত হচ্ছি।

অংশগ্রহণকারীর স্বাক্ষর ....

১ নং সাক্ষীর স্বাক্ষর ....

২ নং সাক্ষীর স্বাক্ষর ....

<center>75</center>

APPENDIX 1: CONSENT FORM (English)

Assalamu-alaikum/ Namasker. My name is Romesa Nasir, student of BSc in physiotherapy at Bangladesh Health Professions Institute (BHPI), CRP. I am conducting a study for partial fulfillment of Bachelor of Science in Physiotherapy degree, titled, "Effectiveness of educational booklet for chronic neck pain".

Through this research, I will see the efficacy of educational booklet along with existing physiotherapy for the case of chronic neck pain. For this regard, I would need to collect data from the patient having chronic neck pain.

Considering the area of research, you have met the inclusion criteria and i would like to invite you as a subject of my study. If you participate in this study, I will evaluate for a particular intervention (Effectiveness of educational booklet with Conventional Physiotherapy) for chronic neck pain. The interventions that would be given are safe and will not cause any harm.

I want to meet you a few couple of sessions during your as usual therapy. Your participation will be voluntary. You have the right to withdraw consent and discontinue participation at any time.

If you have any query about the study or your right as a participant, you may contact with, researcher Romesa Nasir or Sohorab Hossain, Associate Professor of Physiotherapy, BHPI and Head of Programs, CRP, Savar, Dhaka-1343.

Do you have any questions before I start?

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

Yes: ☐   No: ☐

Signature of the Interviewer   _____

I ………………………………………….have read and understand the contents of the form. I agree to participant in the research without any force.

Signature of the participant   _____

প্রশ্নপত্র (বাংলা)

ঘাড়ের ব্যথায় শিক্ষণীয় বইয়ের কার্যকারিতা

কোড নং-

এই প্রশ্নপত্র ঘাড়ে ব্যথার রোগীর জন্য প্রণীত।

রোগীর নামঃ   পেশাঃ   বয়সঃ   লিঙ্গঃ

তারিখঃ

ঠিকানাঃ

এই প্রশ্নপত্র ঘাড়ে ব্যথার রোগীর জন্য প্রণীত। ১ নং থেকে ৮ নং প্রশ্ন রোগীর ব্যথা নির্দেশ করে, প্রতিটি প্রশ্নের শেষ এ একটি লম্বা লাইন আছে, আপনার হাতের বাম পাশ নির্দেশ করে কোন ব্যথা নেই আর ডান পাশ নির্দেশ করে তীব্র ব্যথা আর মাঝামাঝি নির্দেশ করে মধ্যম ব্যথা। আপনি যতটুকু ব্যথা অনুভব করেন তা ক্রস দিয়ে চিহ্নিত করুন। ৯ নং থেকে ১৭ নং প্রশ্নের উত্তর পরীক্ষক লিপিবদ্ধ করবেন।

১. বিশ্রামরত অবস্থায় আপনার ব্যথার পরিমান কত?

চিকিৎসার পূর্বে

◄——|——|——|——|——|——|——|——|——|——|——►
  ০   ১   ২   ৩   ৪   ৫   ৬   ৭   ৮   ৯   ১০

চিকিৎসার পরে

◄——|——|——|——|——|——|——|——|——|——|——►
  ০   ১   ২   ৩   ৪   ৫   ৬   ৭   ৮   ৯   ১০
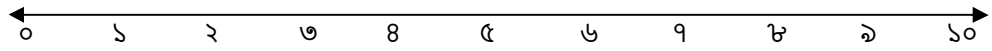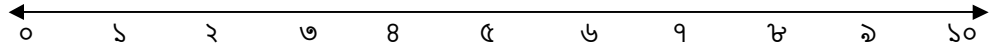
এখানে ০ মানে কোন ব্যথা নেই, ১ থেকে ৩ মানে অল্প ব্যথা, ৪ থেকে ৬ মানে মধ্যম ব্যথা আর ৭ থেকে ১০ মানে তীব্র ব্যথা।

২) কাজের সময় আপনার ব্যথার পরিমাণ কত?

চিকিৎসার পূর্বে

◄——|——|——|——|——|——|——|——|——|——|——►
   ০   ১   ২   ৩   ৪   ৫   ৬   ৭   ৮   ৯   ১০

চিকিৎসার পরে

◄——|——|——|——|——|——|——|——|——|——|——►
   ০   ১   ২   ৩   ৪   ৫   ৬   ৭   ৮   ৯   ১০
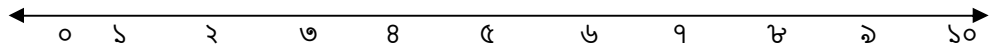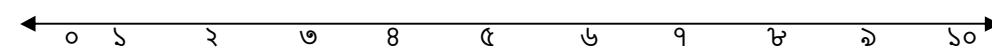
এখানে ০ মানে কোন ব্যথা নেই, ১ থেকে ৩ মানে অল্প ব্যথা, ৪ থেকে ৬ মানে মধ্যম ব্যথা আর ৭ থেকে ১০ মানে তীব্র ব্যথা ।

৩) বসে থাকলে আপনার ব্যথার পরিমাণ কত **?**

চিকিৎসার পূর্বে

| ০ | ১ | ২ | ৩ | ৪ | ৫ | ৬ | ৭ | ৮ | ৯ | ১০ |

চিকিৎসার পরে

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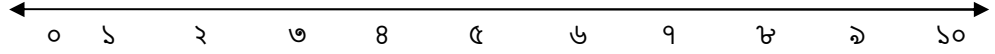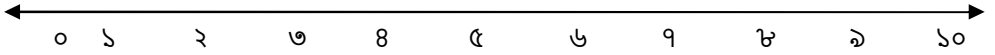
এখানে ০ মানে কোন ব্যথা নেই, ১ থেকে ৩ মানে অল্প ব্যথা, ৪ থেকে ৬ মানে মধ্যম ব্যথা আর ৭ থেকে ১০ মানে তীব্র ব্যথা ।

৪) দাড়িয়ে থাকলে আপনার ব্যথার পরিমাণ কত **?**

চিকিৎসার পূর্বে

| ০ | ১ | ২ | ৩ | ৪ | ৫ | ৬ | ৭ | ৮ | ৯ | ১০ |

চিকিৎসার পরে

| ০ | ১ | ২ | ৩ | ৪ | ৫ | ৬ | ৭ | ৮ | ৯ | ১০ |
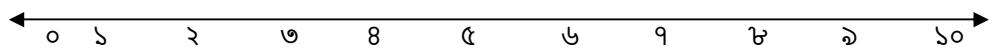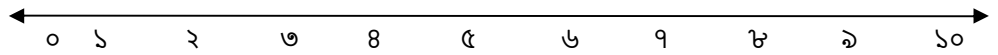
এখানে ০ মানে কোন ব্যথা নেই, ১ থেকে ৩ মানে অল্প ব্যথা, ৪ থেকে ৬ মানে মধ্যম ব্যথা আর ৭ থেকে ১০ মানে তীব্র ব্যথা ।

৫) হাটার সময় আপনার ব্যথার পরিমাণ কত **?**

চিকিৎসার পূর্বে

| ০ | ১ | ২ | ৩ | ৪ | ৫ | ৬ | ৭ | ৮ | ৯ | ১০ |

চিকিৎসার পরে

| ০ | ১ | ২ | ৩ | ৪ | ৫ | ৬ | ৭ | ৮ | ৯ | ১০ |
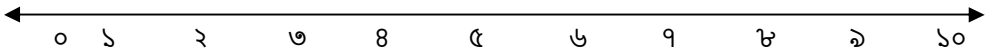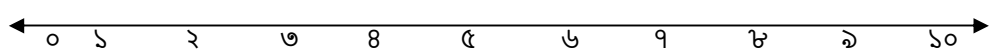
এখানে ০ মানে কোন ব্যথা নেই, ১ থেকে ৩ মানে অল্প ব্যথা, ৪ থেকে ৬ মানে মধ্যম ব্যথা আর ৭ থেকে ১০ মানে তীব্র ব্যথা ।

৬) ঘুমানোর সময় আপনার ব্যথার পরিমাণ কত ?

চিকিৎসার পূর্বে

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

চিকিৎসার পরে

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০
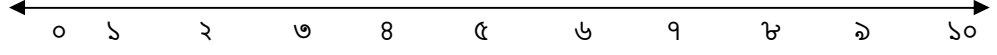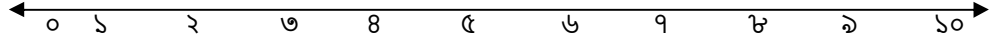
এখানে ০ মানে কোন ব্যথা নেই, ১ থেকে ৩ মানে অল্প ব্যথা, ৪ থেকে ৬ মানে মধ্যম ব্যথা আর ৭ থেকে ১০ মানে তীব্র ব্যথা।

৭) ঘাড় ঘুরানোর সময় আপনার ব্যথার পরিমাণ কত ?

চিকিৎসার পূর্বে

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

চিকিৎসার পরে

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০
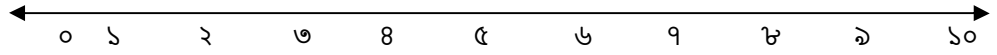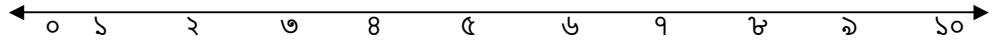
এখানে ০ মানে কোন ব্যথা নেই, ১ থেকে ৩ মানে অল্প ব্যথা, ৪ থেকে ৬ মানে মধ্যম ব্যথা আর ৭ থেকে ১০ মানে তীব্র ব্যথা।

৮) ঘাড় ভাঁজ করার সময় আপনার ব্যথার পরিমাণ কত ?

চিকিৎসার পূর্বে

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

চিকিৎসার পরে

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০
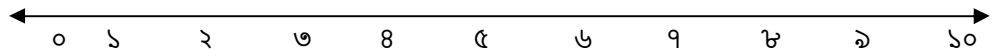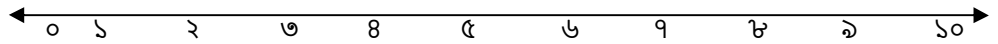
এখানে ০ মানে কোন ব্যথা নেই, ১ থেকে ৩ মানে অল্প ব্যথা, ৪ থেকে ৬ মানে মধ্যম ব্যথা আর ৭ থেকে ১০ মানে তীব্র ব্যথা।

৯) ঘাড়ের পেসিভ ফ্লেক্সন (পরীক্ষক পরিমাপ করবেন গনিওমিটার দিয়ে)

চিকিৎসার পূর্বে .... ডিগ্রি

79

চিকিৎসার পরে .... ডিগ্রি

১০) ঘাড়ের পেসিভ এক্সটেনশন (পরীক্ষক পরিমাপ করবেন গনিওমিটার দিয়ে)

চিকিৎসার পূর্বে .... ডিগ্রি

চিকিৎসার পরে .... ডিগ্রি

১১) ঘাড়ের পেসিভ রোটেশন ডান (পরীক্ষক পরিমাপ করবেন গনিওমিটার দিয়ে)

চিকিৎসার পূর্বে .... ডিগ্রি

চিকিৎসার পরে .... ডিগ্রি

১২) ঘাড়ের পেসিভ রোটেশন বাম (পরীক্ষক পরিমাপ করবেন গনিওমিটার দিয়ে)

চিকিৎসার পূর্বে .... ডিগ্রি

চিকিৎসার পরে .... ডিগ্রি

গবেষক

রোমেছা নাছির

৪র্থ বর্ষ বিএসসি ইন ফিজিওথেরাপি

APPENDIX II: Questioner (English)

Effectiveness of educational booklet for chronic neck pain

Code No.

This questionnaire is developed for the patient with chronic neck pain.

Patient's name: Occupation: Age: Sex:

Address: Date:

This questionnaire is designed for chronic neck pain patients. There are some questions (QN 1- QN 8) and with each question there is a long line. The line represents pain situation. The left hand end represents no pain and right hand end represents severe pain. Please a mark on the line where you feel it shows how much pain you have. The Answer of other questions (QN 9- QN 17) will be enlisted by examiner by using some measurement tools.

1. How severe your pain is at resting position?

Pre test
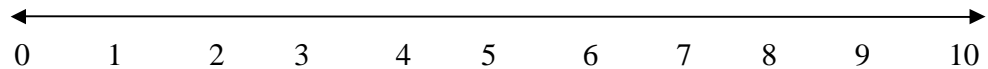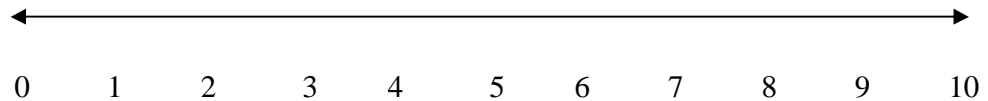
←————————————————————————→

0   1   2   3   4   5   6   7   8   9   10

Post test

←————————————————————————→
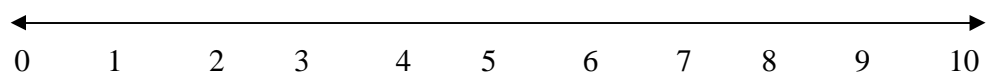
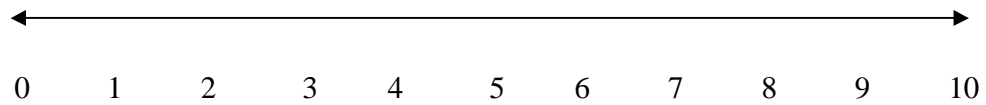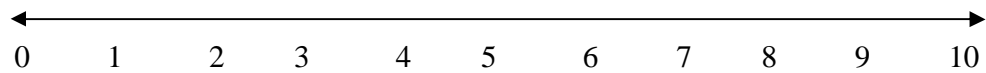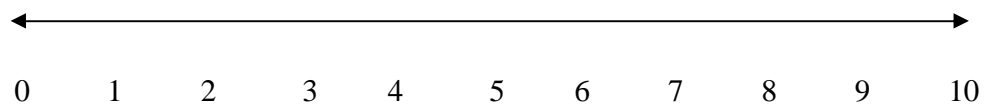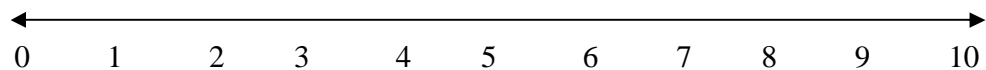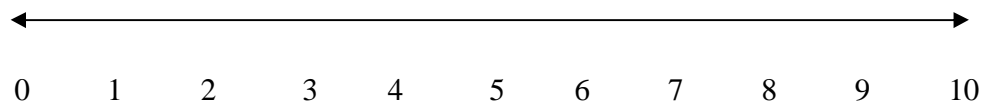0   1   2   3   4   5   6   7   8   9   10

(A Zero (0) indicates no pain, 1-3 indicates mild pain, 4-6 indicates moderate pain and 7-10 indicates severe pain)

2. How severe is your pain during activity?

Pre test
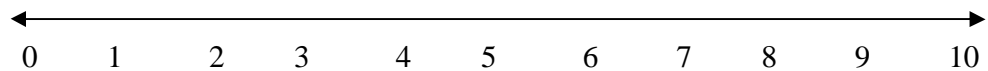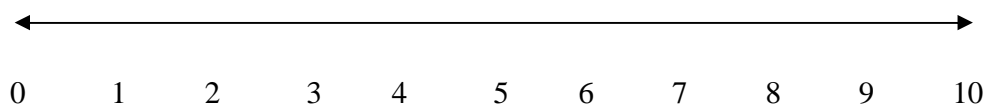
←————————————————————————→

0   1   2   3   4   5   6   7   8   9   10

Post test

←————————————————————————→

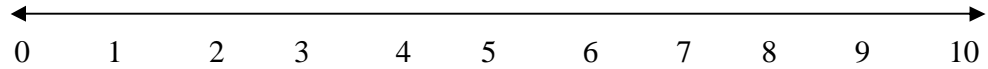0   1   2   3   4   5   6   7   8   9   10

(A Zero (0) indicates no pain, 1-3 indicates mild pain, 4-6 indicates moderate pain and 7-10 indicates severe pain)

3. How severe is your pain during sitting?

Pre test
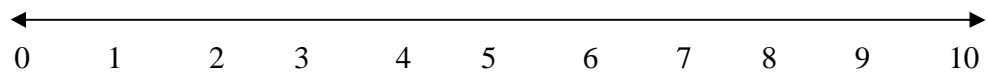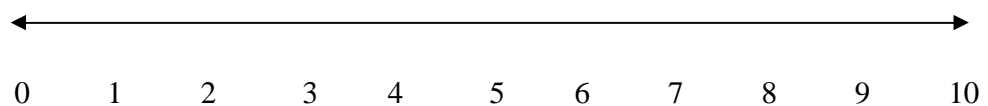
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Post test

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

(A Zero (0) indicates no pain, 1-3 indicates mild pain, 4-6 indicates moderate pain and 7-10 indicates severe pain)

4. How severe is your pain during standing?

Pre test
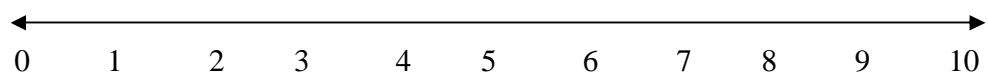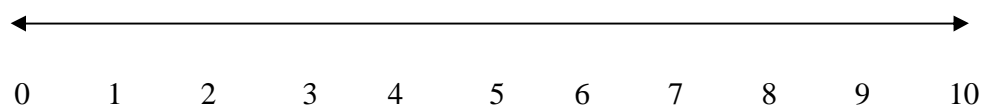
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Post test

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

(A Zero (0) indicates no pain, 1-3 indicates mild pain, 4-6 indicates moderate pain and 7-10 indicates severe pain)

5. How severe is your pain during walking?

Pre test

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Post test

0　　1　　2　　3　　4　　5　　6　　7　　8　　9　　10

(A Zero (0) indicates no pain, 1-3 indicates mild pain, 4-6 indicates moderate pain and 7-10 indicates severe pain)

6. How severe is your pain during sleeping?

Pre test

0　　1　　2　　3　　4　　5　　6　　7　　8　　9　　10

Post test

0　　1　　2　　3　　4　　5　　6　　7　　8　　9　　10

(A Zero (0) indicates no pain, 1-3 indicates mild pain, 4-6 indicates moderate pain and 7-10 indicates severe pain)

7. How severe is your pain during neck turning?

Pre test

0　　1　　2　　3　　4　　5　　6　　7　　8　　9　　10

Post test

0　　1　　2　　3　　4　　5　　6　　7　　8　　9　　10

(A Zero (0) indicates no pain, 1-3 indicates mild pain, 4-6 indicates moderate pain and 7-10 indicates severe pain)

8. How severe is your pain during neck bending?

Pre test
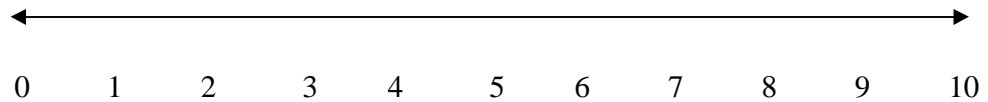
← 0   1   2   3   4   5   6   7   8   9   10 →

Post test

← 0   1   2   3   4   5   6   7   8   9   10 →

(A Zero (0) indicates no pain, 1-3 indicates mild pain, 4-6 indicates moderate pain and 7-10 indicates severe pain.

9. Passive ROM of neck flexion (Measured by examiner with goniometer)

Pre- treatment ………….. Degrees

Post- treatment ………….. Degrees

10. Passive ROM of neck extension (Measured by examiner with goniometer)

Pre- treatment ………….. Degrees

Post- treatment ………….. Degrees

11. Passive ROM of neck rotation right (Measured by examiner with goniometer)

Pre- treatment ………….. Degrees

Post- treatment ………….. Degrees

12. Passive ROM of neck rotation left (Measured by examiner with goniometer)

Pre- treatment ………….. Degrees

Post- treatment ………….. Degrees

Researcher

Romesa Nasir

B.Sc in Physiotherapy

ঘাড়ের ব্যথায় ফিজিওথেরাপি

রোগীদের ঘাড়ের ব্যথা উপশমে প্রয়োজনীয় উপদেশসমূহ

সর্বশ্রেষ্ঠ ও সর্বশক্তিমান আল্লাহর নামে শুরু করছি। "ঘাড়ের ব্যথায় ফিজিওথেরাপি" বইটি তৈরির প্রধান উদ্দেশ্য হচ্ছে বিভিন্ন গবেষণায় দেখা গেছে যে ফিজিওথেরাপি চিকিৎসা ও উপদেশ সমূহ ঘাড়ের ব্যথা উপশমে একটি কার্যকরী পন্থা। সেক্ষেত্রে এই বইটি ফিজিওথেরাপি চিকিৎসা এবং রোগীদের মাঝে একটি সেতু বন্ধন হিসেবে কাজ করবে। একই সাথে আমি এই গবেষণাটি ব্যাচেলর অব সায়েন্স ইন ফিজিওথেরাপী ডিগ্রির পরিপূর্ণতার জন্য করছি। আমার এই বইটি সম্পূর্ণ করতে সবসময় সব ধরণের

দিক নির্দেশনা দিয়েছেন আমার তত্ত্বাবধায়ক মোহাম্মাদ সোহরাব হোসেন, সহযোগী অধ্যাপক ফিজিওথেরাপি, বি.এইচ.পি.আই এবং হেড অফ প্রোগ্রামস, সি.আর.পি। এছাড়া সার্বিক ভাবে সহযোগিতা করার জন্য আমি আমার অন্যান্য শিক্ষকমণ্ডলী, ক্লিনিক্যাল ফিজিওথেরাপিস্ট এবং আমার বন্ধু বান্ধব সবার প্রতি আমি কৃতজ্ঞ।

গবেষক
রোমেছা নাছির

তত্ত্বাবধায়ক
মোহাম্মাদ সোহরাব হোসেন
সহযোগী অধ্যাপক ফিজিওথেরাপি, বি.এইচ.পি.আই
হেড অফ প্রোগ্রামস, সি.আর.পি

প্রথমিক তথ্য

ঘাড়ের গঠন :

আমাদের বেশীরভাগ মানুষই জীবনের কোন এক সময় ঘাড়ে ব্যথায় ভোগেন। মেরুদণ্ডের ঘাড়ের অংশকে মেডিক্যাল ভাষায় সারভাইক্যাল স্পাইন বলে। মেরুদন্ডের উপরের সাতটি কশেরুকা ও দুই কশেরুকার মাঝখানের ডিস্ক, পেশি ও লিগামেন্ট নিয়ে সারভাইক্যাল স্পাইন বা ঘাড় গঠিত। মাথার হাড় (স্কাল) থেকে মেরুদণ্ডের সপ্তম কশেরুকা (সি-৭) পর্যন্ত ঘাড় বিস্তৃত।
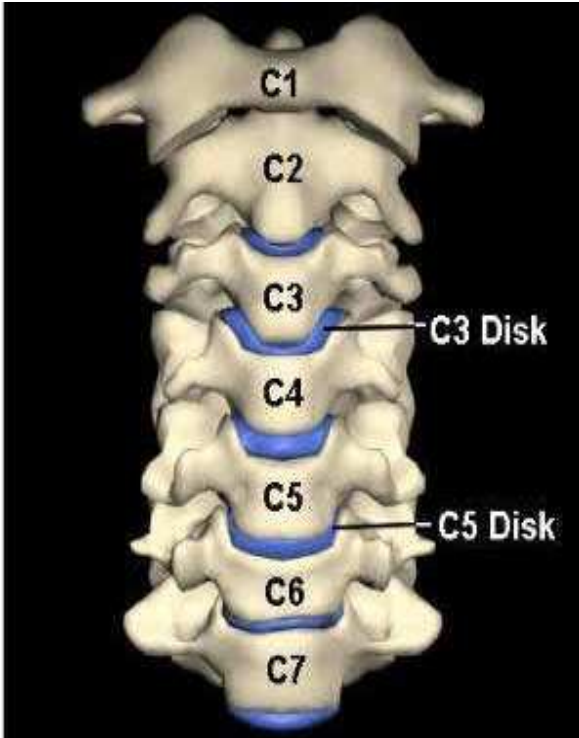
সি-১ প্রথম কশেরুকা

সি-২ দ্বিতীয় কশেরুকা

সি-৩ তৃতীয় কশেরুকা

সি-৪ চতুর্থ কশেরুকা

সি-৫ পঞ্চম কশেরুকা

সি-৬ ষষ্ঠ কশেরুকা

সি-৭ সপ্তম কশেরুকা

আট জোড়া সারভাইক্যাল স্পাইন নার্ভ (স্নায়ু) ঘাড়, কাঁধ, বাহু, নিুবাহু এবং হাত ও আঙুলের চামড়ার অনুভূতি ও পেশির নড়াচড়া প্রদান করে।

ঘাড়ে ব্যথা কি?
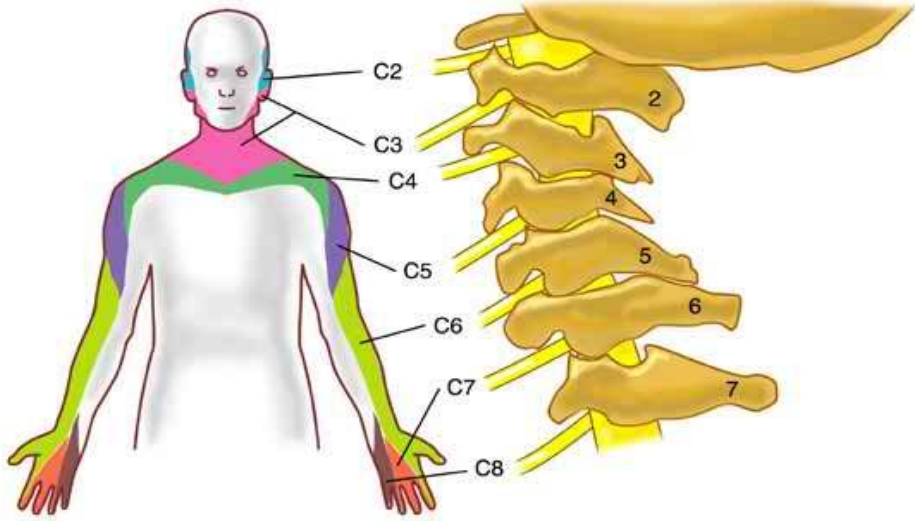
ঘাড়ে ব্যথা হল কিছু রোগের লক্ষণ, উপসর্গ ও অভিযোগের সম্মিলন যা অক্ষমতার জন্য দায়ী। কিন্তু এটি কোন বিশেষ ও নির্দিষ্ট রোগ নয়।

ঘাড়ে ব্যথার কারণ কি?

- নার্ভ বা স্নায়ুচাপজনিত ব্যথা
- ঘাড়ের মাংসপেশী শক্ত হয়ে গেলে
- অনেকক্ষন কম্পিউটারের সামনে কাজ করার সময় ঘাড়ের পজিশন ঠিক না থাকলে অথবা মনিটর এর পজিশন ঠিক না থাকলে।
- খেলাধুলা করতে গিয়ে আঘাত পেলে ঘাড়ে অথবা মাথায় আঘাত পেলে।
- মেরুদন্ড জীবাণু দ্বারা সংক্রমিত হলে, বা হাড় ভেঙ্গে অথবা ফেটে গেলে,
- মানসিক চাপ, অপর্যাপ্ত ঘুমের কারনে অথবা যে কোন কারণে অতিরিক্ত চিন্তাগ্রস্ত হয়ে পড়লেও ঘাড় ব্যথা হতে পারে

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- ব্লক ভার্টিব্রা থাকলে বা দুটি হাড়ের মধ্যবর্তী স্থানে কোন ডিস্ক না থাকলে বা ফিউজড় হয়ে গেলে ঘাড়ের ব্যথা হয়।
- অস্বাভাবিক পজিশনে নিদ্রা বা অনিদ্রা
- উচ্চ রক্তচাপ ও হৃদরোগ
- হাড় ও তরুণাস্থির প্রদাহ এবং ক্ষয়
- অস্টিওপরোসিস বা হাড়ের ক্ষয় ও ভঙ্গুরতারোগ
- ছাত্র-ছাত্রীর চেয়ারে বসে পড়াশোনা করার সময় ঘাড় ও মাথার অবস্থান ঠিকমতো না হলে অথবা উপুড় হয়ে শুয়ে বই পড়লে

ঘাড়ে ব্যথার হার :

একটি সমীক্ষায় দেখা গেছে, প্রতি ১০ জনের মাঝে ৭ জন তার জীবনের কোন না কোন সময় ঘাড়ের ব্যথায় আক্রান্ত হয়। কিছু কিছু ক্ষেত্রে এই ব্যথা সামান্য হলেও, অনেক ক্ষেত্রেই এই ব্যথা মারাত্মক হতে পারে। ঘাড়ের সমস্যা পুরুষের তুলনায় মহিলাদের বেশি হয়।

প্রধান উপসর্গ সমূহ :

- ঘাড় ব্যথা এবং এই ব্যথা কাঁধ, বাহু, হাত ও আঙুল পর্যন্ত বিস্তৃত হতে পারে
- কাঁধ, বাহু, হাত ও আঙুলে অস্বাভাবিক অনুভূতি বা অবশ ভাব
- হাতের আঙুল জয়েন্ট ফুলে যাওয়া, হাতে ঝিনঝিন বা জ্বালাপোড়া করা ও ভারী লাগা
- ঘাড়ের কার্যক্ষমতা বা মুভমেন্ট কমে যাওয়া, মাঝে মাঝেই ঘাড়ের পেশী সংকুচিত হয়ে যাওয়া
- বাহু, হাত ও আঙুল দুর্বল হতে পারে
- ঘাড়ের মুভমেন্ট ও দাঁড়ানো অবস্থায় কাজ করলে ব্যথা বেড়ে যায়
- ঘাড় নিচু করে ভারি কিছু তোলা বা অতিরিক্ত কাজের পর তীক্ষ্ণ ব্যথা
- হাঁচি, কাশি দিলে বা সামনে ঝুঁকলে ব্যথা বেড়ে যায়
- শরীরে অসহ্য দুর্বলতা লাগে, ঘুমের বিঘ্ন ঘটে এবং কাজ করতে অক্ষমতা লাগে, শারীরিক ভারসাম্য হারাবে
- রাতে বেশি ব্যথা হলে বা ব্যথার জন্য ঘুম ভেঙে যায়
- দীর্ঘসময় কম্পিউটারে কাজ করতে না পারা, অল্পতেই মাথা ধরা,

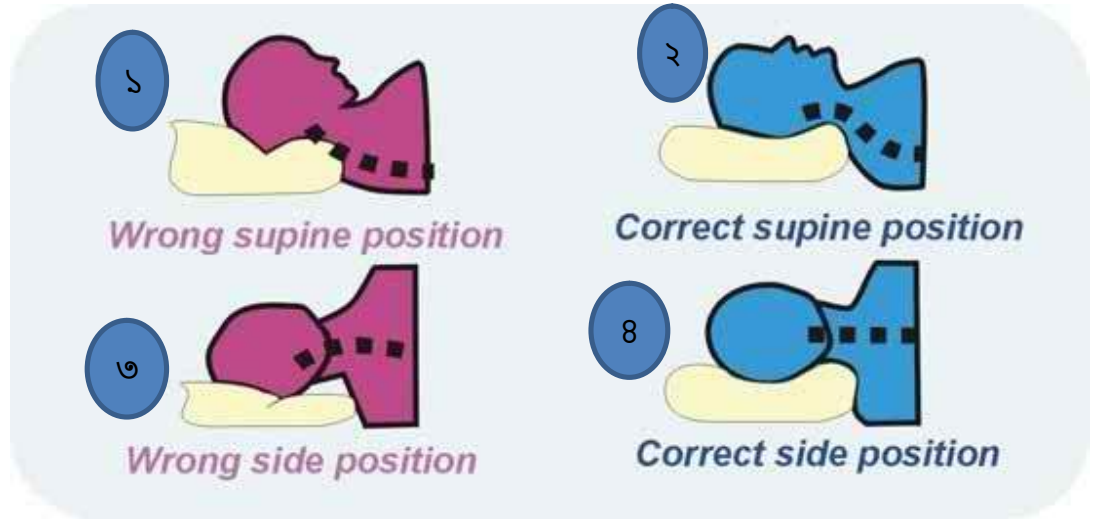# শরীরের সঠিক অবস্থান সমূহ

বসার সঠিক নিয়ম:
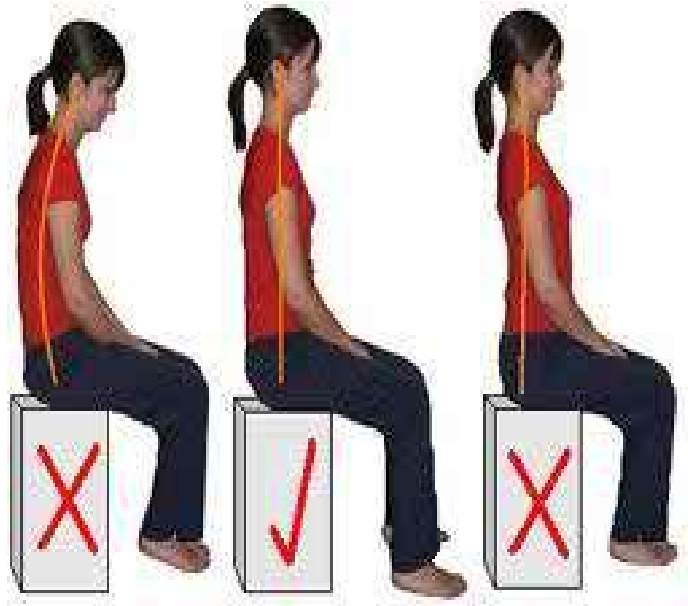
দাঁড়ানোর সঠিক নিয়ম:

ঘুমানোর সঠিক নিয়ম:

১ নম্বর চিত্রঃ চিৎ হয়ে শোয়ার ভুল নিয়ম

২ নম্বর চিত্রঃ চিৎ হয়ে শোয়ার সঠিক নিয়ম

৩ নম্বর চিত্রঃ কাত হয়ে শোয়ার ভুল নিয়ম

৪ নম্বর চিত্রঃ কাত হয়ে শোয়ার সঠিক নিয়ম
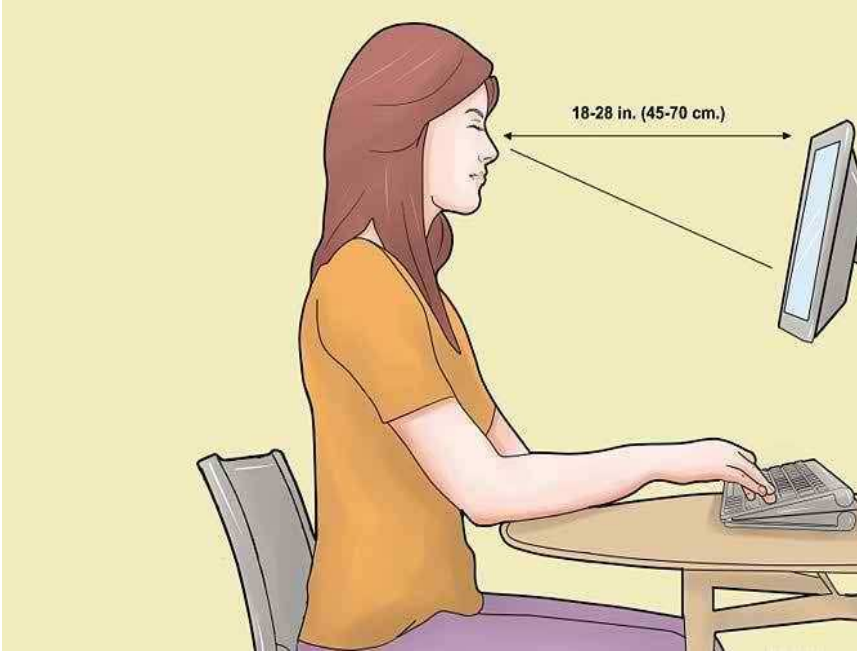
কম্পিউটারের সামনে বসার সঠিক নিয়মঃ

চেয়ারে কোমর থেকে কাঁধ সোজা রেখে বসুন। হেলে বা বেঁকে বসলে সহজেই আপনার পিঠ ও কাঁধে ব্যথা হতে পারে।

এটা নিশ্চিত করুন যাতে কাজের সময় আপনার কাঁধ রিলাক্স থাকে, টাইপিং এর সময় হাত আর আপনার কাঁধের পেশিতে বেশী চাপ সৃষ্টি করবেন না।

কম্পিউটারের সামনে সঠিকভাবে বসতে আপনার মনিটরের অবস্থান সঠিক করুন। আপনার মনিটরটি আপনার কীবোর্ড এর কাছাকাছি বসার চেয়ারের ঠিক সামনে রাখুন।

আপনার সারাদিনের কাজের ফাঁকে ফাঁকে বিরতি নিন। প্রতি ২০ থেকে ৩০ মিনিট কাজ করার পর নিজেকে ও শরীরের অন্যান্য অংশগুলোর সঠিক কার্যক্ষমতা বজায় রাখতে একটু হাঁটুন বা হাত পাগুলো নড়াচড়া করুন। কমপক্ষে ৫ থেকে ১০ মিনিট বিশ্রাম নিন। আপনার চোখ একভাবে মনিটরে নিবদ্ধ না রেখে চোখের বিশ্রাম নিশ্চিত করুন। ১০ কি ১৫ সেকেন্ড এর জন্য চোখটা বন্ধ করুন বা মনিটর থেকে চোখ সরিয়ে দূরের কোন কিছুতে দৃষ্টি নিবদ্ধ করুন।

জীবন যাপন ও খাদ্যাভাস

নিয়ন্ত্রিত জীবন যাপন ও খাদ্যাভাস পারে আমাদের ঘাড়ের ব্যথাকে প্রতিহত করতে। এর জন্য যা করনীয় তা হল-

- অহেতুক চিন্তা না করা, মন ভালো ও হাসি খুশি থাকা।
- পর্যাপ্ত ঘুম
- উচ্চ রক্তচাপ কমানোর জন্য নিয়মিত ওষুধ সেবন করা
- খাদ্যের যেসব উপাদান উচ্চ রক্তচাপ কমাতে সহায়ক যেমন ক্যালসিয়াম, পটাশিয়াম ও ম্যাগনেশিয়াম সমৃদ্ধ খাবার খেতে হবে।
- ধূমপান না করা
- মদ্যপান ও নেশা না করা
- নিয়মিত নির্বাচিত থেরাপি অনুশীলন করা।

বাড়িতে করণীয় চিকিৎসা

নিচে প্রদর্শিত চিত্র সমুহের মাঝে যে থেরাপিটি আপনার জন্য সঠিক এবং উপকারী সে নির্দিষ্ট থেরাপিটি ফিজিওথেরাপিস্ট টিক চিহ্নের মাধমে নির্বাচিত করে দিবেন।

১,৩,৪ এবং ৫ নম্বর থেরাপিঃ ২ ঘণ্টা পর পর ১০ বার করে

২ নম্বর থেরাপিঃ রাতে ঘুমানোর সময় ব্যবহার করবেন।

৬ নম্বর থেরাপিঃ ১০ মিনিট করে দিনে ২ বার

১। রিট্রাকশন:

ক) রিপিটেড রিট্রাকশনঃ থুতনিকে কিছুটা সামনে নিয়ে আবার পিছনে নিয়ে আসতে হবে এবং বুকের সাথে লাগানোর চেষ্টা করতে হবে।
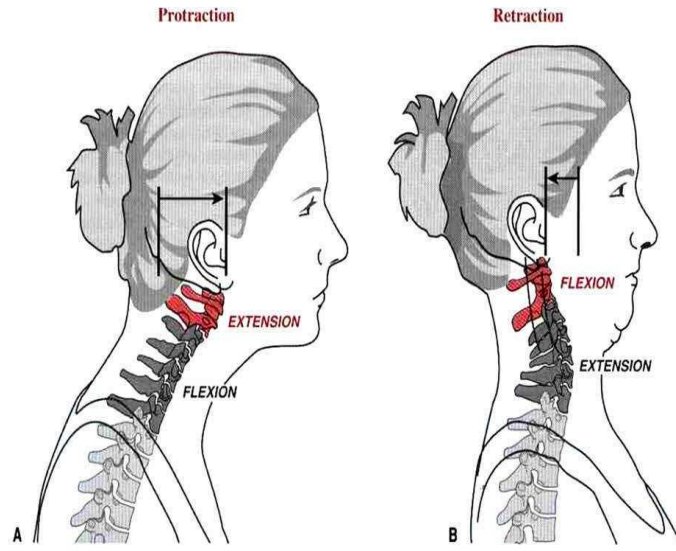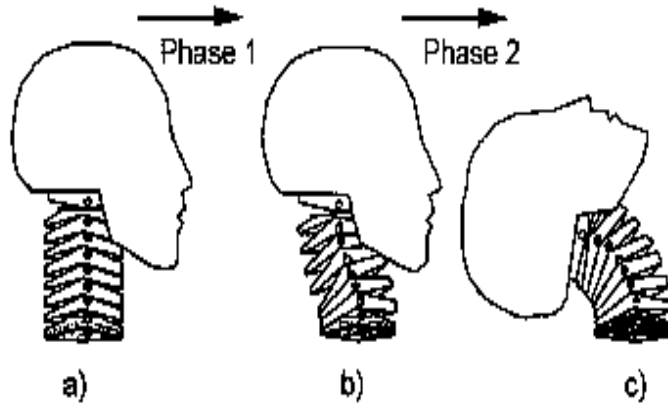
খ) রিপিটেড রিট্রাকশন উইথ সেলফ ওভার প্রেসারঃ

থুতনিকে কিছুটা সামনে নিয়ে আবার পিছনে নিয়ে আসতে হবে এবং একই সাথে মধ্যমা আর বৃদ্ধা আঙ্গুল দিয়ে চাপ দিয়ে থুতনিকে বুকের সাথে লাগানোর চেষ্টা করতে হবে।
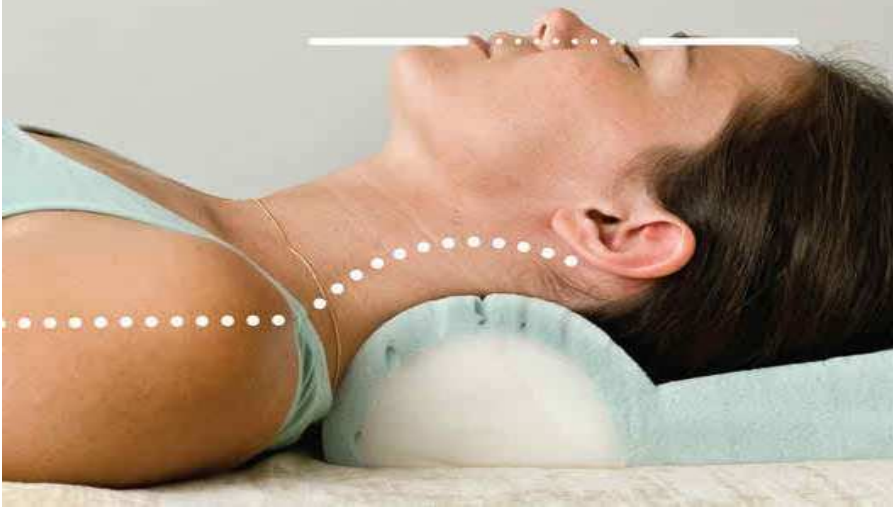

গ) রিপিটেড রিট্রাকশন এক্সটেনশন

থুতনিকে কিছুটা সামনে নিয়ে আবার পিছনে নিয়ে আসতে হবে এবং বুকের সাথে লাগানোর চেষ্টা করতে হবে এবং একই সাথে মাথাটাকে আবার পিছনে নিতে হবে।

২। সাসটেন এক্সটেনশন: রাতে ঘুমানোর সময় সারভাইক্যাল রোল ব্যবহার

৩। সাসটেন নেচারাল অ্যাপোফাইসিয়াল গ্লাইডঃ

মাথার পিছনে গামছা দিয়ে দুই প্রান্ত ধরে সামনে টানতে হবে এবং একই সাথে মাথাটাকে পিছনে নিতে হবে।
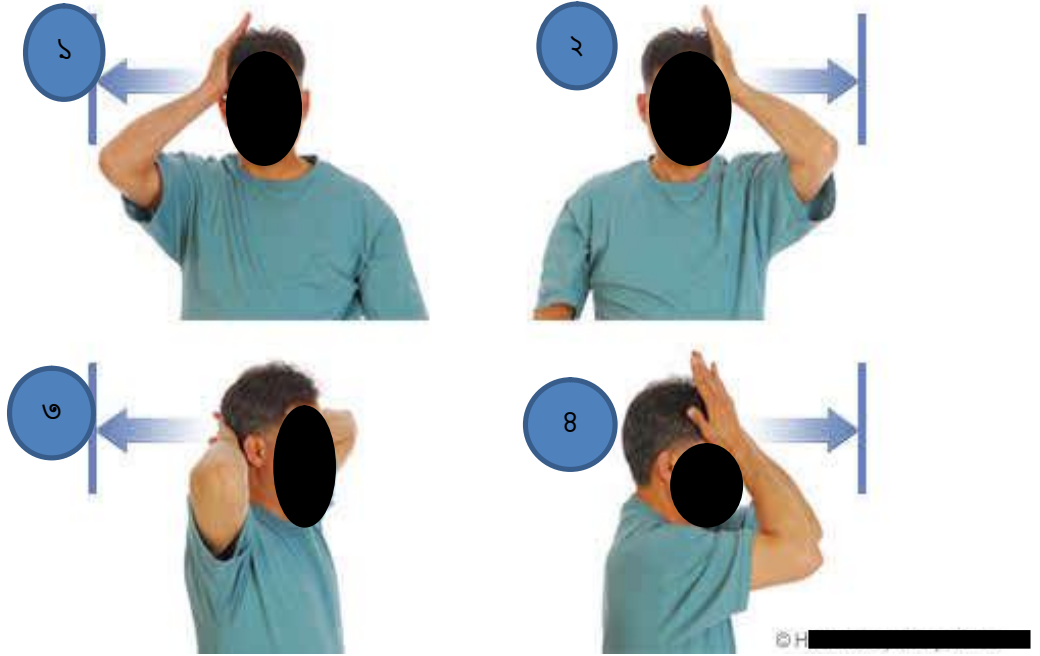
৪। সেলফ স্ট্রেন্দিং:

১ নম্বর চিত্রঃ ডান হাত দিয়ে মাথায় চাপ দিতে হবে এবং একই সাথে মাথা দিয়েও হাতে চাপ দিতে হবে

২ নম্বর চিত্রঃ বাম হাত দিয়ে মাথায় চাপ দিতে হবে এবং একই সাথে মাথা দিয়েও হাতে চাপ দিতে হবে

৩ নম্বর চিত্রঃ দুই হাত দিয়ে মাথার পিছনে চাপ দিতে হবে একই সাথে মাথা দিয়েও হাতে চাপ দিতে হবে

৪ নম্বর চিত্রঃ দুই হাত দিয়ে মাথার সামনে চাপ দিতে হবে একই সাথে মাথা দিয়েও হাতে চাপ দিতে হবে
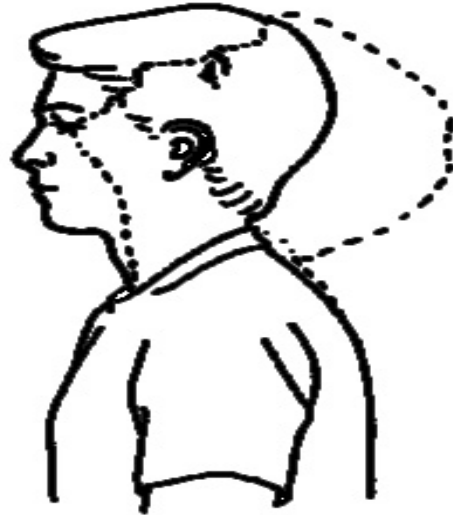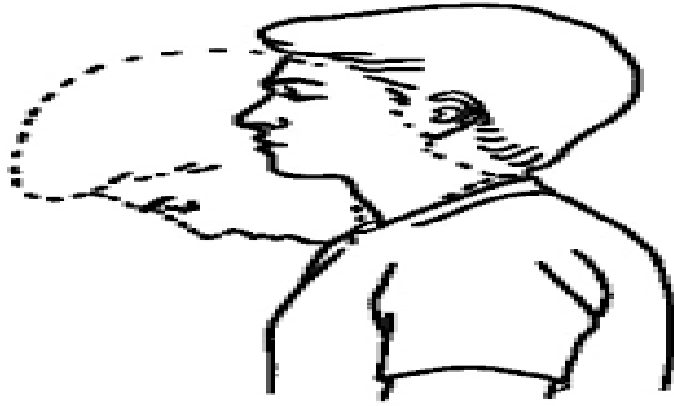
৫। সেলফ স্ট্রেচিং:

ক) ঘাড়ে এক্সটেনসর এবং ফ্লেক্সর গ্রুপের মাংসপেশীর স্ট্রেচিং:

সামনের দিকে তাকিয়ে ধীরে ধীরে মাথা নিচের দিকে নামাতে হবে এবং পাঁচ সেকেন্ড ধরে রাখতে হবে। তারপর আবার আগের অবস্থানে ফিরিয়ে আনতে হবে। একই ভাবে আবার উপরে উঠাতে হবে এবং পাঁচ সেকেন্ড ধরে রাখতে হবে। তারপর আবার আগের অবস্থানে ফিরিয়ে আনতে হবে।
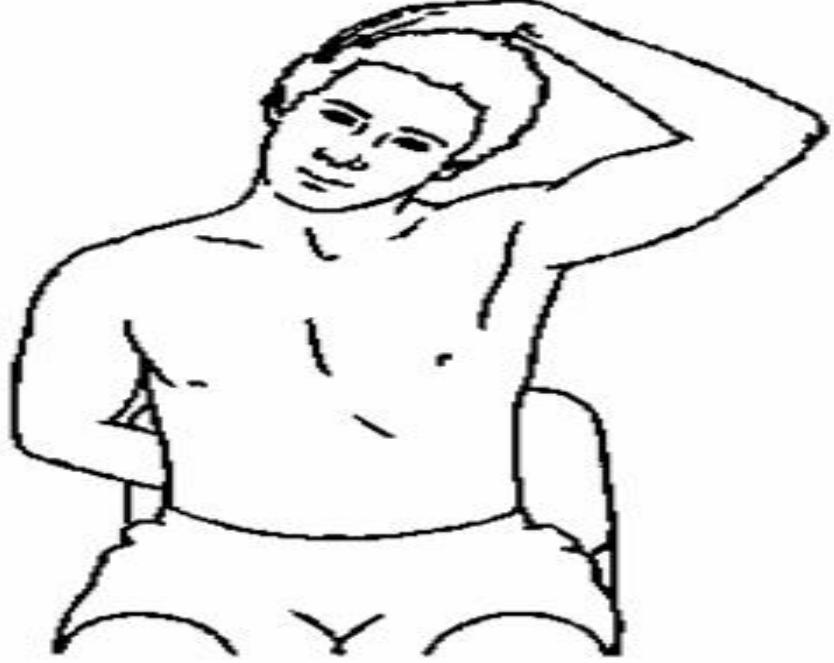
খ) স্টারনোক্লিডোম্যাসটয়েড স্টেচিং :

সামনের দিকে তাকিয়ে ধীরে ধীরে চিবুককে কাঁধের দিকে নিতে হবে এবং পাঁচ সেকেন্ড ধরে রাখতে হবে। তারপর আবার আগের অবস্থানে ফিরিয়ে আনতে হবে।

গ) ট্রাপেজিআস স্ট্রেচিং:

সামনের দিকে তাকিয়ে ধীরে ধীরে মাথাটাকে ডান কাত করতে হবে এবং পাঁচ সেকেন্ড ধরে রাখতে হবে। তারপর আবার আগের অবস্থানে ফিরিয়ে আনতে। একই ভাবে বাম পাশেও করতে হবে।

৬। গরম পানির ব্যাগ ব্যবহার
    ১০ মিনিট করে দিনে ২ বার

প্রধান উপদেশসমূহ

- সামনের দিকে ঝুকে দীর্ঘক্ষণ কাজ করবেন না।

- মাথার উপর কোন ওজন নিবেন না।

- প্রয়োজনীয় বিশ্রাম নিতে হবে।

- শক্ত বিছানায় ঘুমাবেন।

- শোবার সময় ১টা মধ্যম সাইজের বালিশ ব্যবহার করবেন যার অর্ধেকটুকু মাথা ও অর্ধেকটুকু ঘাড়ের নিচে দিবেন।

- তীব্র ব্যথা কমে গেলেও ঘাড় নিচু বা উঁচু করা, মোচড়ানো (টুইসটিং) পজিশন বন্ধ করা।

- অতিরিক্ত শারীরিক পরিশ্রম বন্ধ করতে হবে।

- সেলুনে কখনই ঘাড় মটকাবেন না।

- কাত হয়ে শুয়ে দীর্ঘক্ষণ পড়বেন না বা টেলিভিশন দেখবেন না।

- কম্পিউটারে কাজ করার সময় মনিটর চোখের লেভেলে রাখবেন।

শেষ কথা

উপরোক্ত থেরাপি ও উপদেশসমূহ ঘাড়ে ব্যথা উপশমে রোগী নিজে নিজেই বাড়িতে করতে পারবেন। কোন প্রকার অসুবিধা হলে নিকটস্থ ডাক্তার অথবা আপনার ফিজিওথেরাপিস্টের সাথে যোগাযোগ করুন।

March 5, 2015

Head

Department of Physiotherapy, CRP.

CRP, Chapain, Savar, Dhaka-1343.

Through: Head of the Department of Physiotherapy, BHPI.

Subject: Seeking permission for data collection to conduct research Project.

Sir,

With due respect and humble submission to state that I am Romesa Nasir, student of 4th year B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). The Ethical committee has approved my research project entitled: "Effectiveness of educational booklet for chronic neck pain." Under the supervision of Md. Sohrab Hossain, Associate professor of physiotherapy, BHPI & Head of Programs, CRP. I want to collect data for my research project from the Physiotherapy Department at CRP. So I need permission for data collection from musculoskeletal unit of physiotherapy department at CRP, Savar. I would like to assure that anything of the study will not be harmful for the participants.

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

Yours faithfully

Romesa Nasir

05. 03. 2015

Romesa Nasir
4th Professional B.Sc. in Physiotherapy
Class Roll: 01, Session: 2009-2010
Bangladesh Health Professions Institute (BHPI)
(An academic Institution of CRP)
CRP-Chapain,
Savar, Dhaka-1343.