

# Effect of Specific Manipulative Therapy Treatment in Cervico-Brachial Pain Syndrome

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## Abstract

**Introduction:** The heterogeneity of the cervico-Brachial pain syndrome mutual with the diverse focus of manual therapy procedure makes it difficult to construe the evidence as to the effectiveness of precise manual therapy for specific chronic neck problems. Maitland manual therapies have been used in clinical trials of physiotherapy, nevertheless a small number of if any have used a believable non detailed manual therapy or gesture.

**Purpose:** To assess current levels of evidence on the effectiveness of manual therapy interventions for patients with cervico-brachial pain.

**Objectives:** To find out the socio demographic characteristic (age, sex, education) of cervico- brachial pain of participants, to determine the clinical effect of a specific manual therapy techniques on individuals with Cervico-Brachial pain syndrome, to explore the McGill Pain, Northwick Park, Global Rating of Change & Goniometric status due to Cervico-Brachial pain.

**Methodology:** An Experimental research design for this study with pre test and post test from the Cervico-Brachial pain patient in with 75 participants were collected from OPD, Department of Physiotherapy, Gonoshasthaya Medical College, Gono Bishwabidyalay, Mirzanagar, Savar, Dhaka and Department of Physiotherapy & Orthopedic, National Institute of Trauma and Orthopedic Rehabilitation (NITOR), Dhaka and captured in Excel, using an SPSS 21.0 version programs.

**Results:** The entire contestants 75 of this study. The age group was participant from 21-54 years. Mean 33 and (SD±8.599). Among the 75 participants 92% (n=69) were Muslim and 5.3% (n=4) were Hindu in religion and Christian were 2.7% (n=2). Distribution of respondent's neck pain affected by the length of services among the total population (n=75), job length more than 10 years 14.7% (n=11), Job length more than 7 years percentage of affected respondents were 10.7% (n=16), secondary school certificate 8% (n=6), higher secondary school certificate 10.66% (n=8), Bachelor degree 44% (n=33). And master degree 37.3% (n=28).

**Conclusion:** In this study cervical Maitland mobilization is an efficient management for cervico-brachial pain. More exclusively a Maitland mobilization technique, It increases the range of motion that is possible in the neck with upper limbs and it dwindle the pain. They compared it with ultrasound, IFT, IRR which doesn't have any effect. The study chains the connoisseur opinion that in patients with cervicobrachial pain the preliminary treatment of the mechanical interface through cervical mobilization appears preferable to Maitland mobilizing treatment.

**Keywords:** Physiotherapy modalities, Maitland mobilization, cervicobrachial pain, McGill pain, Northwick Park, Global rating of change.

### INTRODUCTION

Cervicobrachial (neck and arm) pain is a recurrently occurring and disabling disorder and has been predictable to account for the preponderance of patients presenting for treatment with cervical spine disorders [1]. When the condition is chronic, it is likely to become a persistent or recurring problem that collision inauspiciously on an individual's psychological as well as physical health [1]. The most current study for the natural history of the condition reported reoccurrence rate to be as high as 32% [2]. In addition to the effect on individuals, persistent disablement could lead to high costs for health care systems and society [3]. Regardless of its collision, there are refusal obvious strategies for the executive of cervicobrachial pain. In cervicobrachial pain can be referred to the arm from somatic structures or radiate to the upper limb from end to end neuropathic mechanism. Abundant classifications have been statements, together with cervicobrachial pain syndrome, cervical radiculopathy and neck and arm pain. For the purpose of this study, cervicobrachial pain is defined as the presence of arm pain associated with cervical spine pain [4]. Surgical and conservative interventions are used in the management of cervicobrachial pain. Surgery has not been shown to be more effective compared to conservative management and has been reported to carry a 4% complication rate [5]. Conservative management has been advocated as the initial treatment of choice for the majority of patients with cervicobrachial pain [6]. Exceptions to this are patients with serious local pathology such as fractures, dislocations, Myelopathy, infections or tumors that require urgent medical and/or surgical intervention [7]. Wolsko et al. [8] conducted a telephone survey in the United States involving 2055 English-speaking adults. This study demonstrated that 54% of participants in the survey who were suffering from neck or back pain sought treatment from complimentary health practitioners, including manual therapists. In contrast only 37% of participants sought treatment from a medical practitioner. Therefore determining the effectiveness of Maitland manual therapy for the treatment of neck pain is imperative. Clinical practice guidelines recommend the use of manual therapy for managing mechanical neck disorders, however, there is limited evidence for the short-term effectiveness of manual therapy for cervical spine pain compared with other treatments. [9] Past systematic reviews of manual therapy and neck pain have arrived at vastly different conclusions on the effectiveness of manual

therapy in treating mechanical neck disorders. [10-13] Several reviews have concluded that there is limited evidence for the effectiveness of spinal manipulation or mobilization in treating mechanical neck disorders, [11-12] but, drawing on much of the same 6 literature, Branford et al. [13] concluded that the use of spinal manipulation and/or mobilization is an effective treatment option for patients with mechanical neck pain.

### RATIONALE FOR THE STUDY

Conservative management of cervicobrachial pain comprises invasive techniques (such as injection therapy and acupuncture) or non-invasive techniques with physiotherapy most utilized within health care. There is limited evidence to support the use of injection therapy [14] and acupuncture [15]. The Task Force on Neck Pain and Associated Disorders published a document in 2008 looking specifically at noninvasive interventions for neck pain, up to 2006. It highlighted that there was inadequate research on cervicobrachial pain for non-invasive interventions and that future research should focus on non-invasive interventions for this patient group [16]. Manual therapy in the form of cervical mobilization is one non-invasive intervention that is commonly used by physiotherapists. High quality systematic reviews have consistently reported mobilization to be of value in 3 the management of cervical spine disorders, such as mechanical neck pain and cervicogenic headache [17, 18, and 19]. However, only limited research has been conducted to determine the therapeutic value of mobilization for patients with cervicobrachial pain [17-20]. Although a wide variety of mobilization techniques are used to treat cervical spine dysfunction, it is unknown whether different techniques have varying therapeutic effect. Small scale, short-term studies have identified that the Maitland mobilization especially lateral glide mobilization technique reduces cervicobrachial pain [21-23]. The primary research aim for the proposed trial was to identify whether the Maitland technique lateral glide cervical mobilization was effective in reducing pain levels in the long-term for patients with chronic cervicobrachial pain.

### MATERIALS AND METHODS

Study Objectives

General Objective

To assess current levels of substantiation on the effectiveness of manual therapy interventions for patients with cervico-brachial pain

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### Specific Objectives

- To stumble on out the socio demographic characteristic (age, sex, education) of cervico-brachial pain of participants.
- To conclude the clinical effect of a specific manual therapy techniques on individuals with Cervico-Brachial pain syndrome.
- To explore the McGill Pain, Northwick Park, Global Rating of Change & Goniometric status owing to Cervico-Brachial pain.

### Study Design

An experimental study design was used for this study with pretest and post test from the Cervico- Brachial pain patient.

### Target Population and Sample Population

All the Cervico-Brachial pain subjects fulfilling the selected criteria were the population of the study. Cervico-Brachial pain patient living in Savar and Dhaka City in Bangladesh between May 2012 to November 2012.

### Study Site and Area

- Department of Physiotherapy & Orthopedic, National Institute of Trauma and Orthopedic Rehabilitation (NITOR), Dhaka.
- OPD, Department of Physiotherapy, Gonoshasthaya Medical College Hospital, Gono Bishwabidyalay, Mirzanagar, Savar, Dhaka

### Study Period

May 2012 to November 2012.

### Sample Size

Actual sample size was

$$n = \frac{z^2 pq}{d^2} = \frac{z^2 p(1-p)}{d^2}$$

$$= (1.96)^2 \times 0.5 \times 0.5 / (0.05)^2$$

$$= 3.84 \times 0.25 / 0.0025$$

$$= 384$$

P=prevalence cervicobrachial pain affected of the total population

$$p = 20.5\% \text{ (Population census-2011)}$$

$$q = 1 - p$$

$$q = 1 - 0.205$$

$$= 0.80$$

d= acceptable margin of error (.05)

but as the study performed as a part of academic research project and there were some limitation, so that 75 samples (47 male and 28 female) was taken as the sample of this study from Gonoshasthaya medical college Hospital and NITOR at Dhaka.

### Inclusion Criteria

- Age limitation 21 - 54 years. Male and female are included. Adhesive Capsulitis. Sub-acromial Bursitis.
- Rotator Cuff Injury.
- Cervical Spondylitis.
- Cervical Spondylolesthesis.
- Recurrent Shoulder Dislocation.

### Exclusion Criteria

- Brachial plexus Stretch.
- Cervical ribs Syndrome.
- Fracture of Cervical Vertebrae.
- Contraindications to manual physiotherapy techniques.
- Specific pathology due to trauma of the shoulder girdle complex, arm or hand on the affected side.
- Cervical Myelopathy.
- Cervical spine surgery within the last 6 months.
- Planned imminent treatment: for example, injections, surgery.

### Sampling Technique

A sample was selected used convenience sampling method. Data collection tools

Demographic in sequence chart were used as data collection and also use as McGill Pain questionnaire, Northwick park questionnaire, Global Rating of change scale and Gonio metric measurement questionnaire. In that time some other necessary materials were used like Papers, Pen, Pencil, file, Computer and pen drive.

### Data Management and Analysis Plan

Data collected through questionnaire. Collected data was coded rightly and put on to entry by using suitable data entry software. Data analysis was done by SPSS version 21 and quantitative statistics and calculated as percentages and presented by using table, bar graph, pie charts etc. Microsoft office Excel 2012 was used to decorating the bar graph. Questions

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were asked according to the English format. Face to face interviews were also effective to describe characteristics of a population. Quality control and quality assurance

The data enumerators were trained and tools were field tested for ensuring the consistency of data. For quality assurance 15% of the total samples were cross checked by the supervisor.

### Ethical Consideration

- Ethical endorsement was acquired from the University Review Board (URB) of Gono Bishwabidyalay (University) Savar, Dhaka, Bangladesh.
- Permission from Director of NITOR was taken to conduct the study of participants.
- Informed written consent (explaining objectives and methods of the study, confidential handling of personal information their rights to withdraw/not responding and voluntary nature of participation) were taken from each of the participants

The whole process of this thesis was done by following the Bangladesh Medical Research Council (BMRC) guidelines and World Health Organization (WHO) Research guidelines.

### Limitation of the study

Expected sample size was more than 384 for this study but due to resource constrain just 75 samples was taken which is very small to generalize the result for the wider population. With regard to the questionnaires used, ethical considerations and lengthy questionnaire led to researcher using a double items measurement procedure that placed limitation on this finding. The questionnaires took approximately 10 minutes to complete its interviewing.

### Expected outcomes

Selection of appropriate outcome measures was based on recommendations from the International Classification of Functioning, Disability and Health (ICF) framework [24]. The outcome measure was pain perception measured on a McGill Pain Questionnaire scale (MPQ). Pain is the key feature of cervicobrachial pain [25]. A high level of pain perception leads to increased disability and reduced function, having an adverse effect on health and wellbeing. Consequently, pain has been the single most consistently used outcome across all studies evaluating effectiveness of intervention on cervicobrachial pain. The Global Rating of Change score (GROC) provided an overall perception of change in pain, ranging from -6 (a great deal worse from baseline) to +6 (a great deal better from baseline); with 0 indicating no change [26]. GROC provided information relating to patient self-perceived change in pain, therein indicating a participant's value of interventional effect. This has been reported to be an important consideration when interpreting study findings. Northwick Park questionnaire scale (NWPQ) [27] was selected as the condition-specific outcome measure to evaluate function and disability. This was chosen because it was the only tool that evaluated symptoms in the neck and arm, collectively, making the content validity high for patients with cervicobrachial pain. Additionally, the NWPQ evaluated psychosocial, occupation and sleep-disturbance to incorporate multiple aspects of function and disability. Gonio metric measurement to actual range of motion identified pretest and post test issues[28].

### RESULTS

Age of the total participant of the study was 75. The age group was participant from 21-54 years. Mean 33 and (SD±8.599). Figure: 1 shows the distribution of age of the participants in bar.

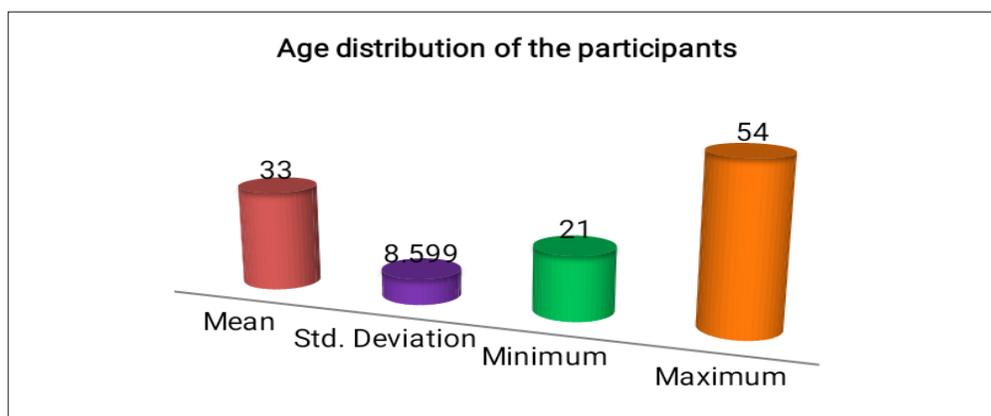
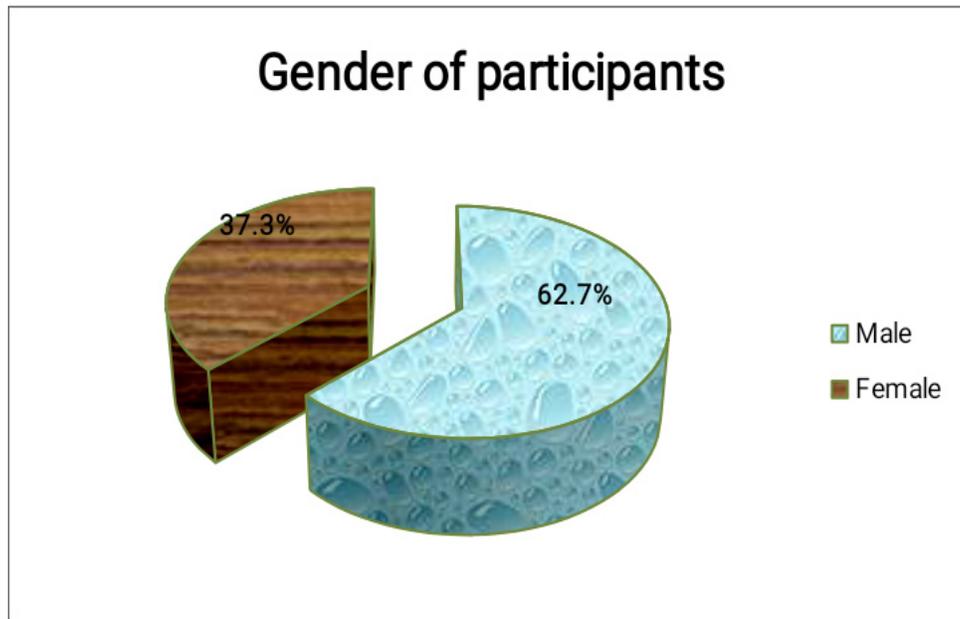


Fig1. Age distribution of the participants

**Gender of Participants**

The number of male participants was 62.7% (n=47) and

female participants were 37.3% (n=28). Figure 2 showed the distribution of sex of the participants in pie.



**Fig2.** Gender of the participants

**Religious Status**

Among the 75 participants 92% (n=69) were Muslim and 5.3% (n=4) were Hindu in religion and Christian

2.7% (n=2). In Table 1 the religious status of the participants have been shown.

**Table1.** Religious status of the participants

Name of religion	Number(n)	Percent (%)
Muslim	69	92
Hindu	4	5.3
Christian	2	2.7

**Educational Status of Participants**

Their educational level was below secondary school certificate 4% (n=3), secondary school certificate 4% (n=3), higher secondary school certificate 10.7%

(n=8), Bachelor degree 44% (n=33). And master degree 37.3% (n=28). Table-2 shows the educational status of the participants.

**Table2.** Educational status of the participants

Educational status	Number(n)	Percent (%)
Below secondary school certificate	3	4
Secondary school certificate	3	4
Higher secondary school certificate	8	10.7
Bachelor degree	33	44
Master degree	28	37.3

**Job Length of the Affected Participants**

Distribution of respondent's neck pain affected by the length of services among the total population (n=75), job length more than 10 years 14.7% (n=11),

Job length lowest 1 years percentage between the year 18, 23 and 25 years of affected respondents were 1.3% (n=1), The job duration of the affected participants has been shown in table: 3

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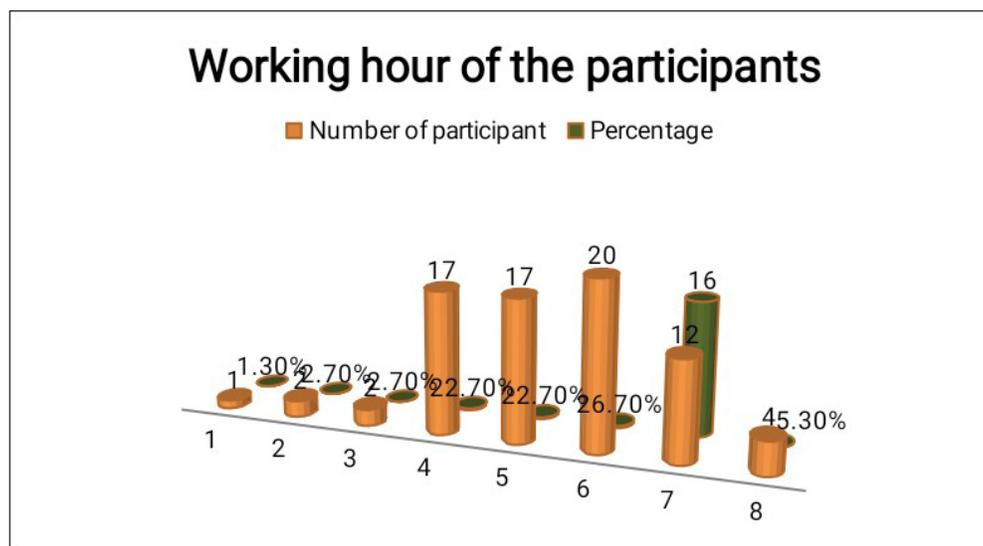
**Table 3.** Job length of the affected participants. Working hour of the affected participants

Year	Number of participant	Percentage
2	3	4.0
3	6	8.0
4	8	10.7
5	3	4.0
6	5	6.7
7	8	10.7
8	3	4.0
9	4	5.3
10	11	14.7
11	2	2.7
12	5	6.7
14	3	4.0
15	2	2.7
18	1	1.3
20	5	6.7
21	2	2.7
23	1	1.3
24	2	2.7
25	1	1.3

In 75 participants only 1.3% (n=1) had to work 1 hours and this participant was affected by neck

pain, had worked 2 hours among 2.7% (n=2) participants were affected by neck pain, had worked 3 hours among 2.7% (n=2) participants were affected by neck pain, had worked 5 hours among 22.7% (n=17) participants were affected by neck pain, had worked 6 hours among 22.7%

(n=17) participants were affected by neck pain, had worked 7 hours among 26.7% (n=20) participants were affected by neck pain, had worked 8 hours among 16% (n=12) participants were affected by neck pain, and had worked 9 hours among 5.3% (n=4) participants were affected by neck pain. Figure: 3 shows the working hour of the affected participants in bar.



**Fig3.** Working hour of the participants

### Range of Motion Analysis

Study found that flexion of the neck range 32, Extension of the neck range 40 degree, Side flexion of the neck

range average 25 degree, right rotation of the neck range 52 degree and left rotation of the neck range 52 in figure 4 showed

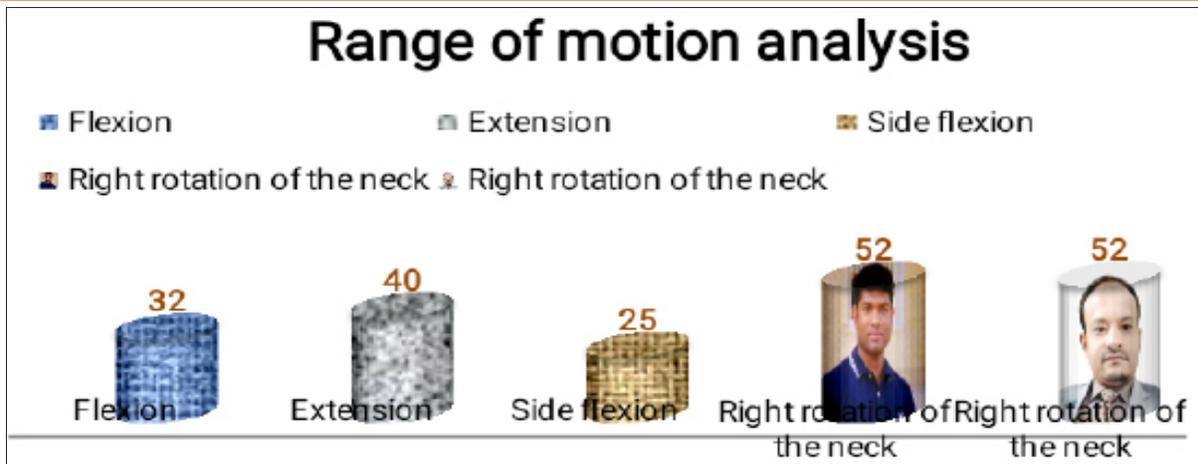


Fig4. Range of motion analysis

**The Mean Deviation Values of Maitland and Conservative Physiotherapy Technique**

Mean and mean difference values for highest mean

deviation Maitland techniques for goniometric measurement 1.4 and CPT were 4.23 and second highest score GRC scale 0.65 and 1.87. (Tab:4)

**Table4.** The mean deviation values of Maitland and Conservative Physiotherapy Technique to help the people's with Cervico-Brachial pain.

Scale	Maitland			CPT		
	Mean		Mean Deviation	Mean		Mean Deviation
	Pre test	Post test		Pre test	Post test	
MPQ-1	6	6.73	0.05	6.2	6.3	0.37
NPQ-2	30.4	33.87	0.2	30	30.4	1.73
GRC-3	2.6	6.33	0.65	2.6	3.9	1.87
GM-4	34.53	43	1.4	39.4	42.2	4.23

**The Standard Deviation Values of Maitland and Conservative Physiotherapy Technique**

The pre test values were assessed values for McGill Pain questionnaires Scale-1, Northwick Park

questionnaire scale-2, Global Rating of Change Scale-3 & Goniometric Measurement Scale-4 in Maitland in group and the standard deviation was .072, 3.86, 1.07 and 12.87 respectively and post test were 0.79, 4.39, 2.03 and 14.29. (Fig: 5)

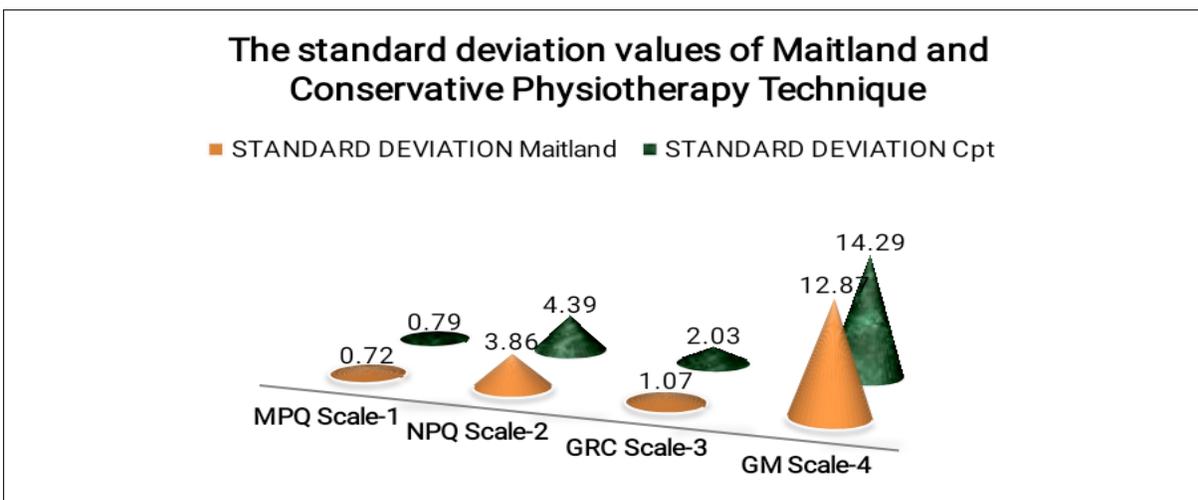


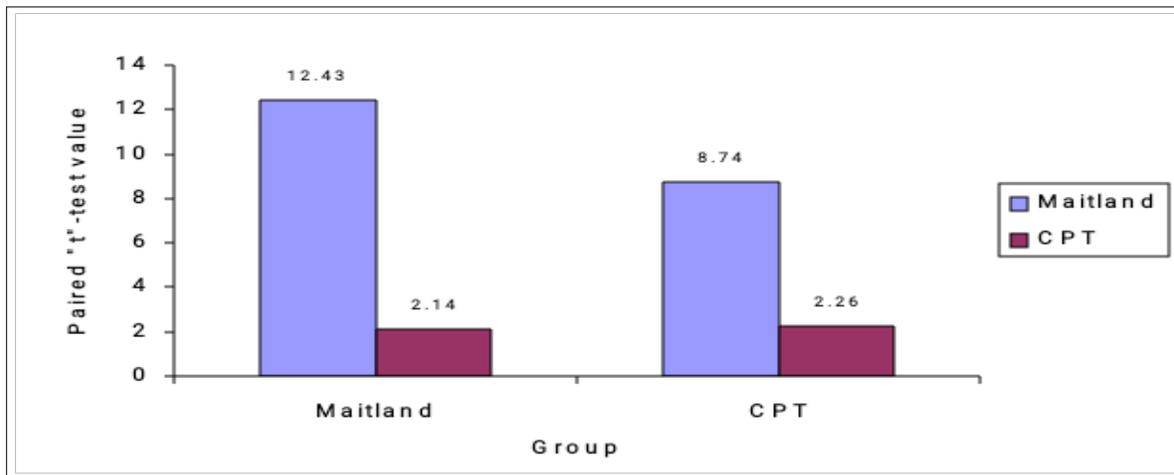
Fig5. The standard deviation values of Maitland and Conservative Physiotherapy Technique to help the people's with Cervico-Brachial pain.

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Paired 't' test values with graph value for Maitland and Conservative Physiotherapy

The 't' values calculated for Maitland by paired 't' test was 12.43 respectively and it was more than table

value 2.14 for 5% level of significance at 14 degree of freedom. By paired 't' test was 8.74 respectively and it was more than the table value 2.26 for 5% level of significance at 14 degree of freedom. (Fig:6)



**Fig6.** Paired t test value for Maitland and CPT

Unpaired 't' test values with graph value for Maitland and Conservative Physiotherapy

Unpaired 't' test was 16.42 and 11.60 respectively.

The 't' values calculated was more than the table value 2.14 and 2.26 for 5% level of significance at 28 degree of freedom. (Tab:5)

**Table5.** Unpaired 't' test values with table value for Maitland and Conservative Physiotherapy Technique

STUDY GROUP	CALCULATED PAIRED 't' VALUES	TABLE VALUE	SIGNIFICANT OR NOT
Maitland	16.42	2.14	SIGNIFICANT
CPT	11.60	2.26	SIGNIFICANT

## DISCUSSION

The study based on data gathered from Cervicobrachial pain patients who came to Gonoshasthaya Medical College Hospital and NITOR for receive treatment. This was Experimental type of survey on 75 participants who were complained of Cervicobrachial pain. The study found that mean age of the participant was 33 (SD± 8.599) years and most of the participants were above 54 years. The youngest participants in this study were 21 years old and oldest participants were 54 years old. Ardic et al. (2003) performed a cross-sectional study for these purpose 78 patients (mean age 57.8 ± 11.9 years, 55 women and 23 men) were randomly selected for inclusion in the study. Another result has been reported by Chacon, et al. (2004) who concluded that the mean age was 64.9 and their age range was 41-86 years. So above two studies, mean age was not similar to this study. So, this indicated that Cervicobrachial pain had affected the participants in this study earlier than others study. In this study, female participants were 37.3% and male participants were 62.7 Cervicobrachial pain usually

affects patients aged 21-54, with females affected more than males, and no predilection for race (Arshad, et al, 2015). Bachelor degree passed participants were highest rate that was 44% (n=33%). Masters passed participant were second highest rate that was 37.3% (n=28). HSC passed; SSC passed and bellow SSC passed Participants were according to 10.7%, 4%, and 4%. Among the 75 participants 92% (n=69) were Muslim and 5.3% (n=4) were Hindu in religion and Christian 2.7% (n=2). Job length of services among the total population (n=75), job length more than 10 years 14.7% (n=11), Job length lowest 1 years percentage between the year 18, 23 and 25 years of affected respondents were 1.3% (n=1) and In 75 participants only 1.3% (n=1) had to work 1 hours and this participant was affected by neck pain, had worked 2 hours among 2.7% (n=2) participants were affected by neck pain, had worked 3 hours among 2.7% (n=2) participants were affected by neck pain, had worked 5 hours among 22.7% (n=17) participants were affected by neck pain, had worked 6 hours among 22.7% (n=17) participants were affected by neck pain, had worked 7 hours among 26.7% (n=20) participants were affected by neck pain, had worked 8 hours among 16% (n=12)

participants were affected by neck pain, and had worked 9 hours among 5.3% (n=4) participants were affected by neck pain. Study found that flexion of the neck range 32, Extension of the neck range 40 degree, Side flexion of the neck range average 25 degree, right rotation of the neck range 52 degree and left rotation of the neck range 52. the 't' values calculated for Maitland by paired 't' test was 12.43 respectively and it was more than table value 2.14 for 5% level of significance at 14 degree of freedom. by paired 't' test was 8.74 respectively and it was more than the table value 2.26 for 5% level of significance at 14 degree of freedom. Unpaired 't' test was 16.42 and 11.60 respectively. The 't' values calculated was more than the table value 2.14 and 2.26 for 5% level of significance at 28 degree of freedom. This study was to prove Maitland more effective when compared with conservative Physical therapy (CPT) to help the people's with Cervicobrachial pain.

### CONCLUSION

The systematic review and clinical trial have extended the knowledge base for the effectiveness of the Maitland mobilization on the management of cervicobrachial pain. This study is the only two that evaluates the value of the Maitland mobilization as a specific mobilization technique over a prolonged period of time. In doing so, pragmatic problems were encountered including a large number of participants receiving Conservative physical treatment which had the potential to introduce a confounding effect at long-term analysis. Although there is strong evidence suggesting that there are no statistically significant differences in the effectiveness of manual therapy when compared to CPT interventions, patients receiving a manual therapy intervention were significantly more satisfied with their care. Despite the absence of statistically significant results when compared to other interventions, patients receiving manual therapy demonstrated improvements in both the pre test and post test on a variety of outcomes. These included McGill pain scale, GOC, Northwick park Scales and Goniometric measures, and these improvements were especially evident when combined with exercise. This result suggests that multi-modal approach including manual therapy and exercise, is a potentially useful intervention in the management of cervicobrachial pain, however further research is necessary to determine the cost-effectiveness of this approach in comparison to other interventions.

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