



# COMPARISION OF MCKENZIE TREATMENT AND INHIBITIVE DISTRACTION ON CERVICAL RANGE OF MOTION, DISABILITY IN SUBJECTS WITH NON SPECIFIC NECK PAIN

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## Abstract

**Purpose of The Study:** To compare the effectiveness of Mckenzie Method and Inhibitive Distraction on subjects with non-specific neck pain. **Study Design:** This is a Comparative Study. **Participants:** Total of 34 subjects was included based on the inclusion and exclusion criteria through convenient sampling and divide into two groups. **Outcome measure:** A Visual Analogue Scale (VAS) with a 10 cms baseline, A Gravity Inclinometer, Copenhagen Neck Functional Disability Scale. **Results:** The result of present study showed that McKenzie treatment and Inhibitive Distraction, both were found to have significant effect for non specific neck pain. But McKenzie treatment was slightly more effective than Inhibitive Distraction. **Conclusion:** McKenzie treatment and Inhibitive distraction were both proved to have significant improvement on non specific neck pain. Although between group differences were not particularly large for all outcome measures, mckenzie method is effective treatment for patients with non specific neck pain.

**Key Words:** Cervical Range of Motion, Inhibitive Distraction, Mckenzie Treatment

## Introduction

Neck pain is one of the most common persisting symptoms in the general population with an estimate lifetime prevalence of 67% among adults of age group 20 to 69 years. Limited range of motion and a subjective feeling of stiffness may accompany neck pain, which is often precipitated or aggravated by neck movements or sustained neck postures. Headache, brachialgia, dizziness and other signs and symptoms may also be present in combination of neck pain.

Neck pain arises from habitual posture referred as non specific neck pain. Several authors proposed that non specific neck pain problems results from poor posture in terms of sustained long-term abnormal physiological loads on the neck.<sup>16</sup> Instability is one element of cervical pain and may contribute to the clinical presentation of various conditions including cervicogenic headache, chronic whiplash dysfunction, rheumatoid arthritis, osteo arthritis and segmental degeneration.

The Mckenzie method was introduced in Sweden in 1985 and came to be frequently used in the 1990 as a treatment modality for patients with mechanical problems of the spine. Today, physiotherapists in primary care often employ this procedure as both as diagnostic tool and a treatment model. A randomized clinical trial involving patients with neck pain and comparing treatment effect of the Mckenzie method, General exercise and Ultrasound. They found that Mckenzie treatment is more favorable than other.<sup>14</sup>

The Mckenzie protocol has been commonly used in low back condition may also be employed in the treatment of mechanical neck pain in syndromes as Postural, Dysfunction and Derangement. Postural Syndrome is caused by mechanical deformation of soft tissue, as a result of certain postural stresses. The treatment is correction of posture. The dysfunction syndrome is caused by adaptive shortening of certain structure due to poor posture habits. The treatment is stretching shortened structures and postural correction. The derangement syndrome defined as change in the position of the intervertebral discs and alters the position of two adjacent vertebrae. It is treated by neck retraction exercise.

Relevant to the management of patients with neck pain Paris has described a technique called Inhibitive Distraction (ID) in which the therapist uses the fingertips of both hands to exert a sustained ventrocranial force on

the occiput just caudal to the superior nuchal line. He proposed that this technique might inhibit the muscles inserting into the nuchal line and that it could be used to apply a distraction to the cervical spine structure. Paris did not claim this technique as his own, instead ascribing its origin to cranial osteopathy.

The effects of ID on the cervical spine are suggested to involve inhibition of local and general posterior muscle tone, gentle joint mobilization. The previous study shows the effects of ID on flexion of cervical spine as Active Range Of Motion (AROM) but not on all Active Range Of Motion's (AROM's) and cervical pain. So, one objective of this study is to examine whether this intervention would significantly increase all cervical Active Range Of Motion's (AROM's) and also decrease the cervical pain and the related neck disability significantly.

### **Methodology and Study Design**

This is a Comparative study. All subjects were recruited from Dolphin (PG) Institute of Biomedical and Natural Sciences, Dehradun.

### **Sampling**

Total of 34 subjects were chosen as per the inclusion and exclusion criteria, and informed consent was obtained from all the subjects after the procedure was explained to them. Active cervical Range of motion, Pain and disability was measured before the intervention, and the

Subjects were conveniently assigned into two groups. Group A received Mckenzie treatment and Group B received Inhibitive Distraction.

### **Data Collection**

On the first day Pre-test measurement for pain, neck disability and active cervical range of motion was collected. All the subjects were assessed for outcome on 1st day (before the intervention), and the final data was collected on 29th day.

The outcome measures for this study are intensity of pain, neck functional disability and active range of motion.



Fig.: A Gravity Inclinometer with its Strap

Group A received McKenzie exercise according to the following procedure. McKenzie exercise used in the form of neck retraction exercise. The patient is instructed to move the head backwards as far as possible but at the same time maintain forward facing position. It is important that the movement is made to the maximum. On completion the patient returns to the neutral rest position. The movement is done for four sets of 10-15 repetitions with 1-2 minutes rest between each set.

#### First Week

The patient will lying in supine position, chin is tucked in or head is retracted. A small pillow was used under the occiput to maintain slight flexion. The patient will asked to pull his head and neck posterior into a position in which head will directly over the shoulder girdle. The end position is maintained for one second and then allowed to relax into a resting posture. This procedure will done for 4 sets of 10 to 15 repetition and 1 to 2 minutes rest between each set.

#### Second Week

In sitting position, progression was given by the addition of neck extension with chin tucked overpressure in the end range of motion by the therapist. This procedure was done for sets of 10 to 15 repetitions and 1 to 2 minutes rest will given in between each set.

### Third Week

In supine lying, head will kept out of the couch. The retraction and extension exercise with traction will performed by the therapist. The traction and extension will maintained throughout the range of motion.

### Fourth Week

The patient will asked to come in sitting, progression will done by addition of first retraction with lateral flexion, then neck rotation, and finally combined retraction and neck flexion with overpressure performed by the therapist. This procedure will done for four sets of 10 to 15 repetitions and 1 to 2 minutes rest will given between each set.

Group B received Inhibitive Distraction according to the following procedure. The patient will asked to rest supine on the treatment table. In inhibitive Distraction the fingertips were placed onto the suboccipital musculotendinous structure just caudal to the superior nuchal line and a sustained force in a ventrocranial direction, thus exerting compressive forces as well as a distraction to the cervical and suboccipital structures. The pressure applied to achieve muscle inhibition during treatment will applied slowly, maintained, and released slowly; it will applied perpendicular to the longitudinal axis of the muscles and tendons involved. The amount of applied pressure will adjusted to just less than that which would excite the muscle further and as the pressure is maintained and patient's muscles relaxed, ideally the pressure was applied at an increasingly deeper level. The amount of pressure applied was individualized according to therapist perception of the patient's tolerance as reflected by muscle response. This muscle response will constantly monitored and thus the amount of pressure could change during the administration of this intervention. Thus, the force applied varied anywhere from light pressure and no distraction forces applied with the weight of the subject's head partially supported by the therapist's thenar eminences, to the full weight of the subject's head resting on the therapist's fingertips and distraction applied. The ID intervention will applied for 4 minutes.



Fig: Neck Extension and Retraction Exercise

Fig: Inhibitive Distraction

with Traction of Neck in Supine Position

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**Result**

Within group analysis for VAS it was found significant for Group A (p=0.000) and for Group B (p=0.000). (Table1 ).

Table 1: Comparison of pre and post vas score within Group A and Group B

VARIABLE	MEAN		SD		t	p
	PRE	POST	PRE	POST		
GROUP A	4.4167	0.9889	1.13721	0.591	18.001	.000
GROUP B	3.8625	0.8688	0.83974	0.43775	20.243	.000

Within group analysis for CNFDS it was found significant for Group A (p=0.000) and for Group B (0.000). (Table2).

Table 2: Comparison of pre and post CNFDS within Group A and Group B

VARIABLE	MEAN		SD		t	p
	PRE	POST	PRE	POST		
GROUP A	12.7222	1.9444	3.89276	1.21133	14.947	.000
GROUP B	11.8125	2.6875	3.1245	1.19548	14.298	.000

Fig 5.1:

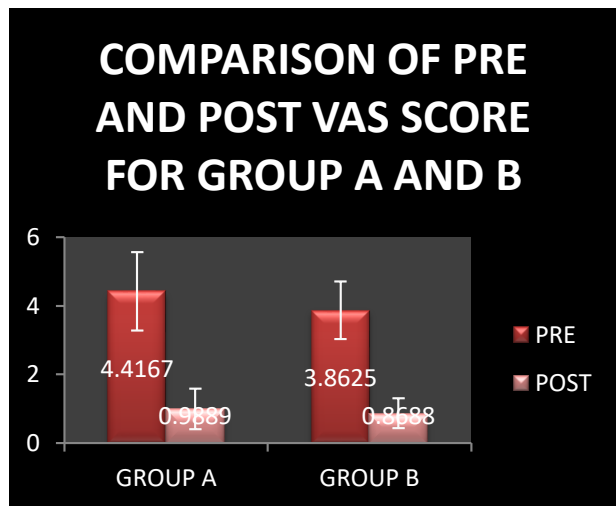
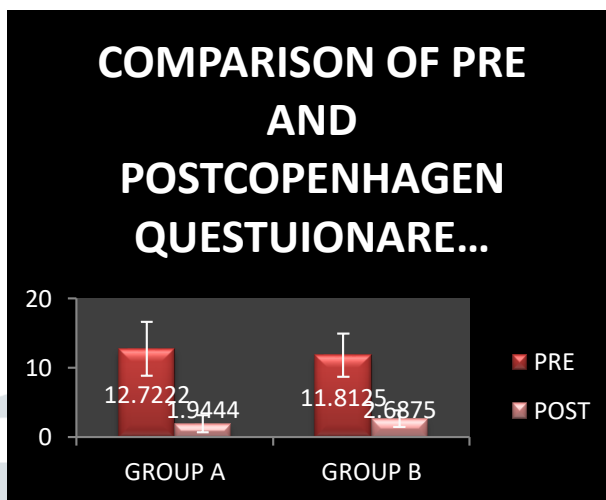


Fig 5.2:



Within group analysis for Flexion ROM it was found significant for Group A (p=0.000) and for Group B (0.000). (Table3).

TABLE 3: WITHIN GROUP ANALYSIS FOR FLEXION ROM

VARIABLE	MEAN		SD		t	p
	PRE	POST	PRE	POST		
GROUP A	51.3333	76.1111	7.79894	6.764	-15.986	.000
GROUP B	45.9375	69.688	8.79749	8.0558	-10.512	.000

Within group analysis for Extension ROM it was found significant for Group A (p=0.000) and for Group B (0.000). (Table4).

TABLE 4: WITHIN GROUP ANALYSIS FOR EXTENSION ROM

VARIABLE	MEAN		SD		T	p
	PRE	POST	PRE	POST		
GROUP A	55	80.3889	8.91133	9.50628	-16.368	.000
GROUP B	54.6875	79.0625	12.03727	9.52519	-10.929	.000

Fig 5.3

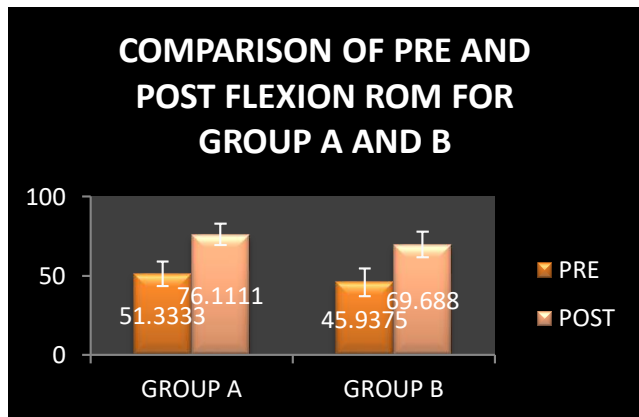
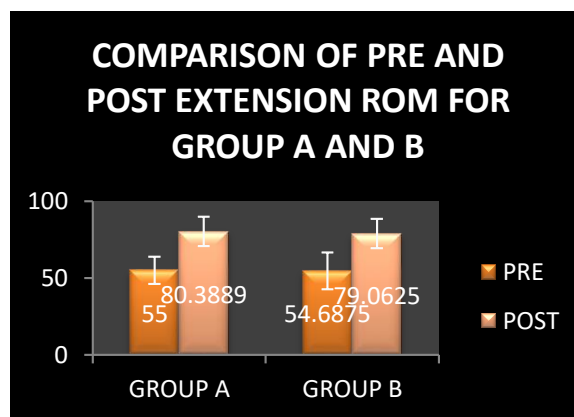


Fig 5.4



Within group analysis for Right Lateral Flexion ROM it was found significant for GroupA (p=0.000) and for GroupB (0.000). (Table5).

TABLE 5.5: WITHIN GROUP ANALYSIS FOR RT LAT FLEXION

VARIABLE	MEAN		SD		t	p
	PRE	POST	PRE	POST		
GROUP A	38.2222	46.9444	4.31898	2.50816	-8.815	.000
GROUP B	38.4375	43.75	3.966	2.88675	-9.604	.000

Within group analysis for Left Lateral Flexion ROM it was found significant for GroupA (p=0.000) and for GroupB (0.000). (Table6)

TABLE 6 : WITHIN GROUP ANALYSIS FOR LT LAT FLEXION

VARIABLE	MEAN		SD		t	p
	PRE	POST	PRE	POST		
GROUP A	37.8333	46.6667	3.56865	2.42536	-9.293	.000
GROUP B	38.75	44.375	4.28174	3.0957	-9.000	.000



Fig 5.6:

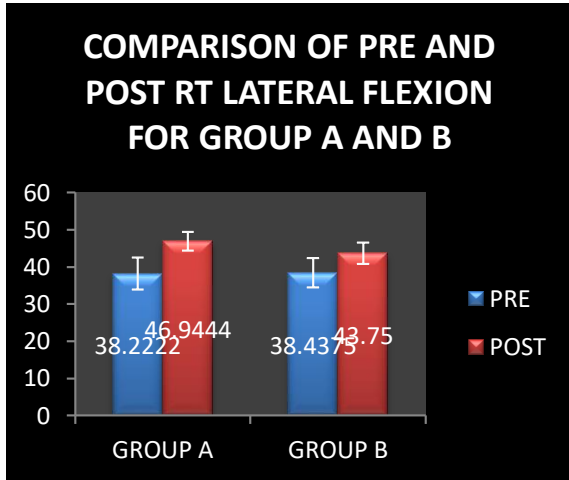
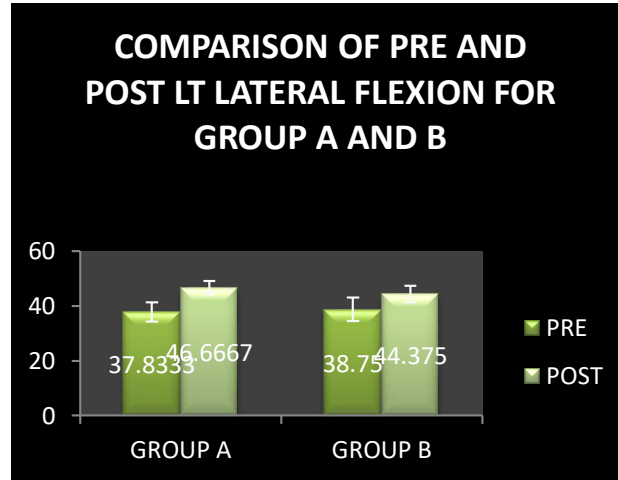


Fig 5.6:



Within group analysis for Right Rotation ROM it was found significant for Group A (p=0.000) and for Group B (0.000). (Table7).

TABLE 5.7: WITHIN GROUP ANALYSIS FOR RT ROTATION ROM

VARIABLE	MEAN		SD		T	p
	PRE	POST	PRE	POST		
GROUP A	53.3333	76.2778	8.22478	4.76267	-12.512	.000
GROUP B	51.5625	71.5625	11.50634	9.07722	-11.711	.000

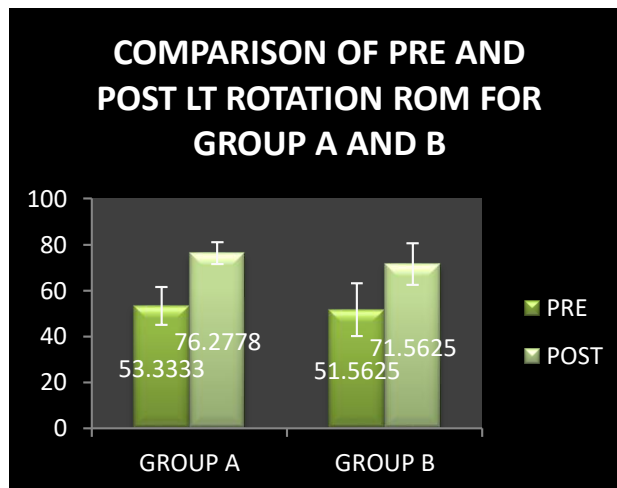
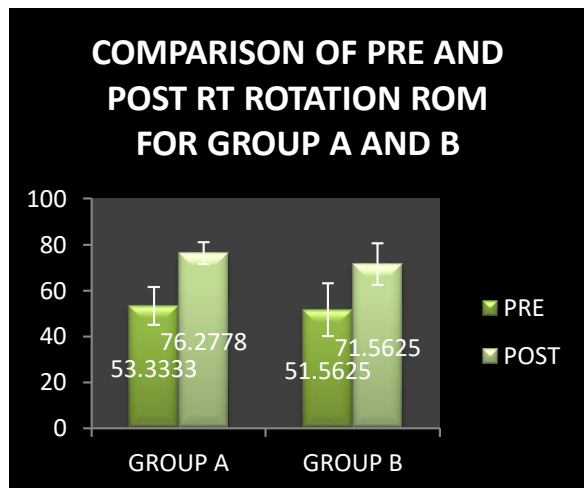
Within group analysis for Left Rotation ROM it was found significant for GroupA (p=0.000) and for GroupB (0.000). (Table8).

TABLE 8: WITHIN GROUP ANALYSIS FOR LT ROTATION ROM

VARIABLE	MEAN		SD		T	p
	PRE	POST	PRE	POST		
GROUP A	53.6111	76.4444	7.30945	3.68179	-12.162	.000
GROUP B	53.4375	71.875	10.11908	9.97914	-12.957	.000

Fig 5.7:

Fig 5.8:



T test was done to compare the data between the groups. Between group analysis for VAS it was found non significant (p=0.510) (Table9).

TABLE 9: BETWEEN GROUP ANALYSIS FOR VAS

VARIABLE	MEAN		SD		T	p
	GROUP A	GROUP B	GROUP A	GROUP B		
PRE	4.4167	3.8625	1.13721	0.83974	1.628	.120
POST	0.9889	0.8688	0.591	0.43775	.666	.510

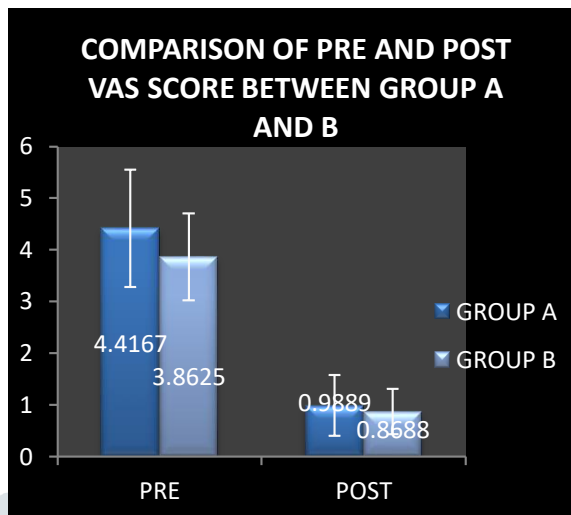
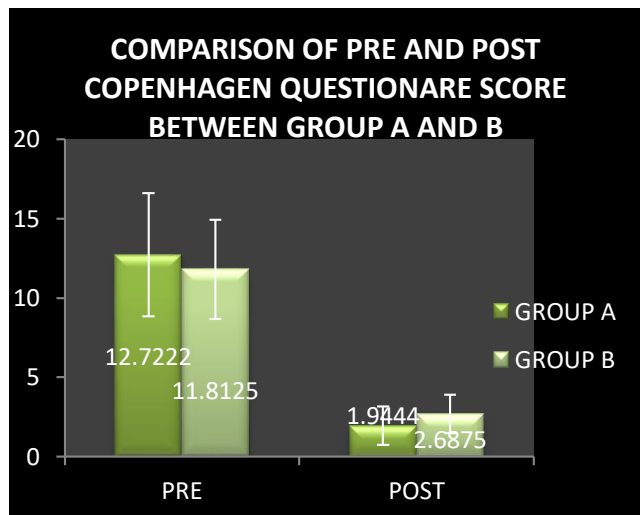
Between group analysis for CNFDS it was found non significant (p=0.082) (Table10).

TABLE 10: BETWEEN GROUP ANALYSIS FOR CNFDS

VARIABLE	MEAN		SD		T	p
	GROUP A	GROUP B	GROUP A	GROUP B		
PRE	12.7222	11.8125	3.89276	3.1245	.755	.462
POST	1.9444	2.6875	1.21133	1.19548	-1.796	.082

Fig 5.9:

Fig 5.10:



Between group analysis for Flexion ROM it was found significant between Group A and Group B ( $p=0.017$ ). (Table11).

TABLE 11: BETWEEN GROUP ANALYSIS FOR FLEXION ROM

VARIABLE	MEAN		SD		T	p
	GROUP A	GROUP B	GROUP A	GROUP B		
PRE	51.3333	45.9375	7.79894	8.79749	1.882	.067
POST	76.1111	69.688	6.764	8.0558	2.527	.017

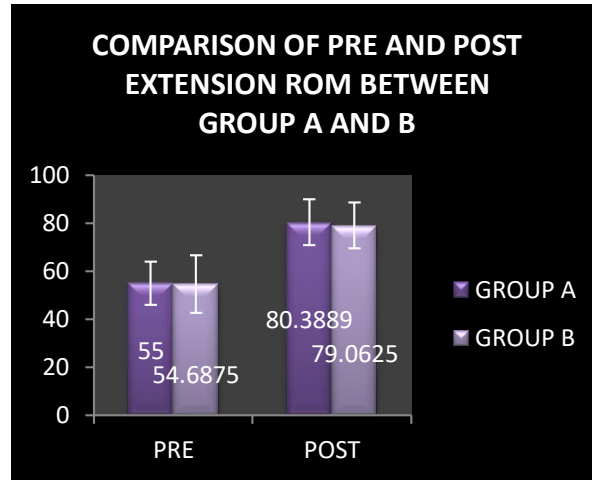
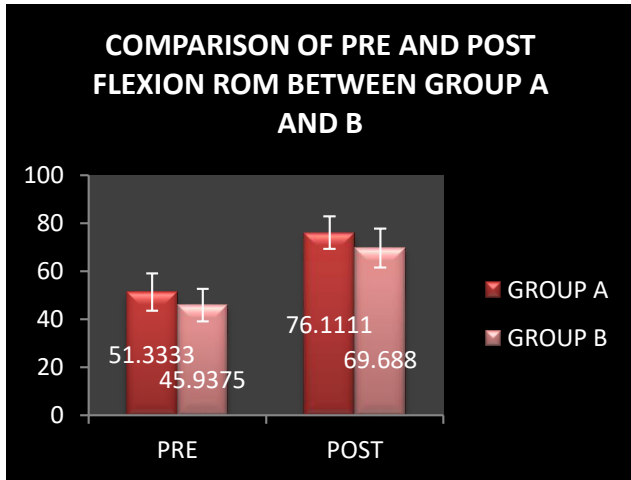
Between group analysis for Extension ROM it was found non significant between Group A and GroupB ( $p=0.688$ ). (Table12).

TABLE 12: BETWEEN GROUP ANALYSIS FOR EXTENSION ROM

VARIABLE	MEAN		SD		T	p
	GROUP A	GROUP B	GROUP A	GROUP B		
PRE	55	54.6875	8.91133	12.03727	.085	.931
POST	80.3889	79.0625	9.50628	9.52519	.406	.688

Fig 5.11:

Fig 5.12:



Between group analysis for Right Lateral Flexion ROM it was found significant between Group A and GroupB (p=0.002). (Table13).

TABLES 13: BETWEEN GROUP ANALYSIS OF RT LAT FLEXION

VARIABLE	MEAN		SD		T	p
	GROUP A	GROUP B	GROUP A	GROUP B		
PRE	38.2222	38.4375	4.31898	3.966	-.151	.881
POST	46.9444	43.75	2.50816	2.88675	3.453	.002

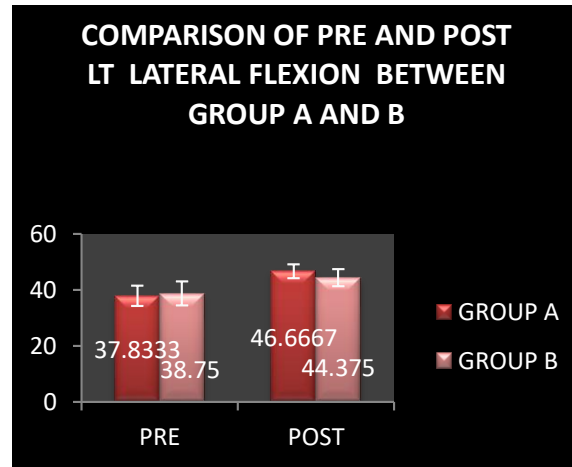
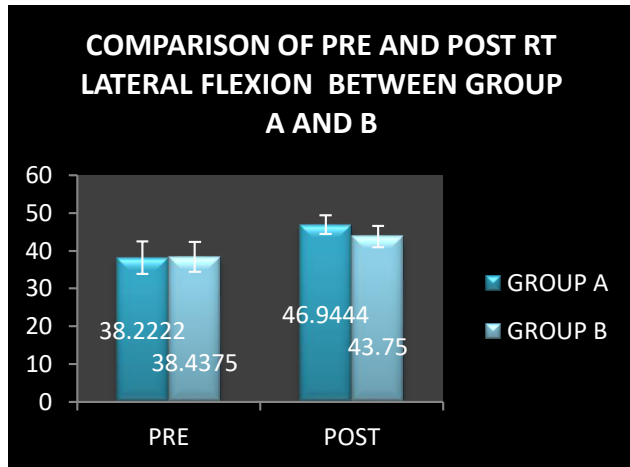
Between group analysis for Leftt Lateral Flexion ROM it was found significant between Group A and GroupB (p=0.022). (Table14).

TABLE 14 : BETWEEN GROUP ANALYSIS OF LT LAT FLEXION

VARIABLE	MEAN		SD		T	p
	GROUP A	GROUP B	GROUP A	GROUP B		
PRE	37.8333	38.75	3.56865	4.28174	-.681	.501
POST	46.6667	44.375	2.42536	3.0957	2.417	.022

Fig 5.13:

Fig 5.14:



Between group analysis for Right Rotation ROM it was found non significant between Group A and GroupB (p=0.063). (Table15).

TABLE 5.15: BETWEEN GROUP ANALYSIS FOR RT ROTATION

VARIABLE	MEAN		SD		T	p
	GROUP A	GROUP B	GROUP A	GROUP B		
PRE	53.3333	51.5625	8.22478	11.50634	.510	.606
POST	76.2778	71.5625	4.76267	9.07722	1.928	.063

Between group analysis for Left Rotation ROM it was found non significant between Group A and GroupB (p=0.079). (Table16).

TABLE 16: BETWEEN GROUP ANALYSIS FOR LT ROTATION

VARIABLE	MEAN		SD		t	p
	GROUP A	GROUP B	GROUP A	GROUP B		
PRE	53.6111	53.4375	7.30945	10.11908	.057	.954
POST	76.4444	71.875	3.68179	9.97914	1.812	.079

Fig 5.15:

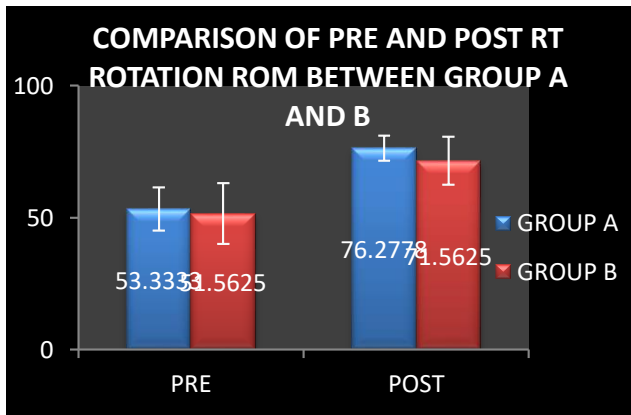
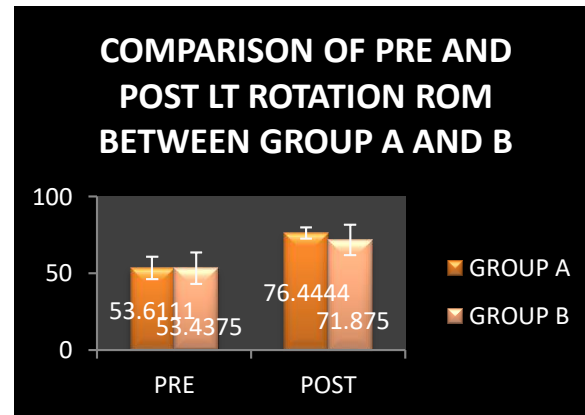


Fig 5.16:



## Discussion

The aim of this study was to find out the changes in non-specific neck pain, active cervical range of motion and related neck functional disability after the interventions of McKenzie treatment and Inhibitive Distraction and to compare the effects.

Two-group analysis revealed no significant differences between the group on pain intensity and disability. The significant difference ( $p < 0.05$ ) detected on cervical flexion, Right lateral flexion and Left lateral flexion ROM in McKenzie group than Inhibitive Distraction group.

The result of present study showed that McKenzie treatment and Inhibitive Distraction, both were found to have significant effect for non specific neck pain. However, McKenzie treatment was slightly more effective than Inhibitive Distraction, but most of the differences between group were not statistically significant.

The McKenzie method of care has been successful in the treatment of neck pain in the short term.<sup>13</sup> It divides conditions by syndromes based on symptoms and their response to loading. On postural syndrome that exhibits neck pain without physical findings. The patient demonstrates a full range of motion and an unremarkable examination. It is thought that normal tissues are placed in a position of prolonged or excessive stretch, with pain ceasing when the offending tension is removed. The dysfunction syndrome whose hypothesized pathoanatomy is adaptively shortened tissue due to scarring or fibrosis of the ligamentous structure in the spine. Overpressure or

sustained loading may increase pain at the end range of motion. The patient exhibits intermittent pain and the symptoms resolve once the stress on the affected tissues is removed.<sup>20,26</sup>

Mckenzie method of treatment i.e. neck retraction exercises produces flexion in the upper cervical segments and simultaneously increases extension in the lower segments. Retraction of the head reverses any anterior shear or translation forces may develop during prolonged end range positioning with head and neck flexed. Thus the restraining ligaments, the apophyseal joint capsules and the posterior annulus are relaxed.<sup>20</sup>

Kjellman G, Oberg B. et al study showed that McKenzie treatment was more favorable than general exercise and the ultrasound in control group, with a more rapid improvement in neck pain intensity during the first 3 weeks and for post treatment neck function.

The procedure of Inhibitive Distraction includes a combination of direct fascial technique and manual traction. The therapist supports the patients occiput in his or her palms, with the second through fifth digits making contact with the skull over the inferior nuchal line and the occiput is distracted away from C1 by pulling it along the table in a cephalward direction toward the therapist. This separation of the occiput from the atlas creates more space at the occiput-atlantal junction, and is repeated several times until the tissue slack has been removed<sup>18</sup>. This procedure supports the mechanism for improvement in range of motions as the tissue slack had been removed. So, this concept supports the results of our study, where the cervical range of motions increased after the intervention of four week Inhibitive Distraction protocol.

## Conclusion

In this study, McKenzie treatment and Inhibitive distraction were both proved to have significant improvement on non specific neck pain. Although between group differences were not particularly large for all outcome measures, mckenzie treatment seems to be a favorable treatment for patients with non specific neck pain and Mckenzie treatment is used as an more effective, in increasing cervical range of motion.

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