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To Compare The Effectiveness Of Mckenzie Technique Versus Deep Transverse Friction Massage With Conventional Therapy In Mechanical Neck Pain

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Abstract:

BACKGROUND: Mechanical neck pain is a prevalent musculoskeletal condition that affects daily functioning and quality of life. Physical therapy interventions such as the McKenzie technique and deep transverse friction massage (DTFM) are commonly employed, yet their comparative effectiveness remains unclear. This study aims to compare the effectiveness of the McKenzie Technique and Deep Transverse Friction Massage (DTFM) combined with conventional therapy in reducing mechanical neck pain.. **METHODS:** A randomized controlled trial was conducted with 40 participants diagnosed with mechanical neck pain. Participants were randomly assigned into two groups: Group A received the McKenzie technique along with conventional therapy, while Group B received DTFM with the same conventional therapy. Treatment was administered over eight weeks. Outcome measures included the numeric pain rating scale (NPRS) for pain intensity, Fuctional rating scale(FRI) for functional status, and WHO QOL BREF, recorded at baseline, mid and post-intervention. **RESULT:** Both groups showed significant improvements in pain and functional status post-intervention ($p < 0.05$). However, Group B (DTFM) demonstrated greater reduction in NPRS and FRI scores compared to Group A (MCKENZIE), with statistically significant differences ($p < 0.05$). WHO-QOL Bref improved in both groups, but the DTFM group showed more notable gains.

CONCLUSION: The Study concluded that the DTFM technique combined with conventional therapy is more effective than Mckenzie technique with conventional therapy in managing mechanical neck pain. It should be considered a preferable approach for reducing pain and disability in clinical practice.

Keywords: Mechanical neck Pain, McKenzie Technique, Deep Transverse Friction Massage, Numerical Pain Rating Scale, Functional Rating Index, Quality Of Life- B

Introduction:

Mechanical neck pain affects a large portion of the population, leading to reduced function and quality of life. Among various physiotherapy approaches, the McKenzie Technique emphasizes self-treatment through repeated spinal movements and postural education, while DTFM focuses on breaking down scar tissue and promoting soft tissue healing. This study investigates which technique, when added to conventional therapy (e.g., hot packs, isometric exercises), is more effective.One in ten people in the general population suffers from mechanical neck discomfort, one of the most common musculoskeletal disorders. Usually brought on by small sprains and strains, this ailment is closely linked to bad posture, particularly while engaging in lengthy activities like reading, using a computer, or using a smartphone. According to , the pain often lasts shorter than three months and may be accompanied by other symptoms such headaches and shoulder pain.Poor posture, neck strain, and repetitive sports or work-related activities are common etiological variables . Hormonal shifts, degenerative changes, and postpartum depression are more likely in women . People with neck pain often have impairments in the superficial and deep cervical extensors, as in addition to the deep cervical flexors.

The McKenzie technique and deep transverse friction massage are two popular therapeutic modalities. The McKenzie approach, which was first presented in Sweden in 1985 by Robin McKenzie, is centered on mechanical diagnosis and treatment as well as posture adjustment. Neck retraction exercises are particularly useful for treating derangement syndrome, which is characterized by inter-vertebral disc displacement **(Sayalee B. Dhane et al., 2023)**.One of the most prevalent musculoskeletal conditions is neck discomfort, which affects most of the general population and working population each year. Specifically, chronic mechanical neck pain.[**RAGIA M. KAMEL et al.2023]**Mechanical neck pain is frequently linked to bad posture and is most likely caused by mild sprains and strains. Pain that has persisted for less than three months is referred to as mechanical neck pain.

James Cyriax created the Cyriax method, also known as deep transverse friction massage, empirically. Because of its therapeutic effects on connective tissues, this approach is frequently used in sports medicine and rehabilitation settings to target soft tissue structures including tendons (**Anshika Singh et al., 2020)**.

In general, the cornerstone for successful postural correction, targeted exercises, and manual treatment are utilized to treat mechanical neck pain and having symptoms like shoulder pain along with headache and neck pain.(**Sayalee B. Dhane et al.2023 July29.)**In comparison to men, women experience neck pain more often due to hormonal changes, degenerative changes and postpartum depression. It is often acknowledged that patients experiencing neck pain have impairments in their Both the superficial and deep extensors of the cervical spine, as well as the Deep Cervical Flexor .One of the most prevalent musculoskeletal conditions is neck discomfort, which affects most of the general population and working population each year. Specifically, chronic mechanical neck pain.[**RAGIA M. KAMEL et al.2023]**Mechanical neck pain is frequently linked to bad posture and is most likely caused by mild sprains and strains. Pain that has persisted for less than three months is referred to as mechanical neck pain.

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Aim of the Study

The study aims to compare the effectiveness of deep transverse friction massage and the McKenzie technique with traditional therapy for mechanical neck discomfort.

Objective Of Study

To evaluate how well the Mackenzie approach works for participants' mechanical neck discomfort.
To assess how well Deep transverse Friction Massage relieves participants' mechanical neck discomfort.
To assess how well the McKenzie Technique and Deep Transverse Friction Massage work in conjunction with traditional therapy for mechanical neck pain

Materials And Methodology:

ETHICAL CONSIDERATION
Ethical consideration

Ethical approval was obtained from the Institutional Ethical Committee (IEC) to the commencement of the study (SGRR/IEC/22/25). It has also registered in **Clinical Trial Registry of India** registration (CTRI/2025/05/086106) and **Copyright Office Government of India (Registration No. LD-25614/2025-CO)** was done and lastly, written informed consent was obtained from all participants. The study was conducted in Shri Mahant Indiresh Hospital, Patel Nagar, Dehradun NOC of Medical Superintendent of Hospital

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Study design and settings
The comparative experimental study was conducted in the Department of Physiotherapy, Shri Guru Ram Rai University, and Shri Mahant Indiresh Hospital, Dehradun. The sample size was determined using G*Power version 3.1.9.7. A total of 40 participants, aged between 20 and 40 years, were recruited using random sampling. Individuals were excluded if they had Ankylosis Spondylosis, Spondylolisthesis,Congenital and Acquired deformity i.e Torticolis, Kyphosis, Scoliosis. After screening the eligibility criteria the participants divided into two groups.

Study duration and time: six months December To May
Treatment Duration: 45 minutes per session 3 Days / week
Study Groups & Duration:

GROUPS	TREATMENTS	OUTCOME MEASUREMENT	TREATMENT DURATION
Group A	McKenzie Exercise with Moist Heat Pack.	NPRS Scale FRI Scale QOL Questionnaire	3 Days /week for 8 Weeks
Group B	DTFM with Moist Heat Pack.		

Two groups were made Group A and Group B with equal distribution of participants in both the groups.
Group A: The McKenzie Technique with a moist heat pack were administered to Group A. Three days a week, for an overall of eight weeks, the treatment was administered for 45 minutes per session. Participants were complete out a pre- and post- questionnaire .Following collection, the data was computed using SPSS. In order to determine whether strategy is more efficient than the other for treating mechanical neck discomfort data analysis was done in accordance with the results.
The participants will received McKenzie cervical exercises including

Neck extension in sitting
Procedure: In the McKenzie technique for the neck extension starting position is in sitting in which the practitioner should ask the subject to sit in a upright position with good posture and then slowly tilting the head backward to look upward, extending the cervical spine while keeping the shoulders relaxed, to assess or treat neck pain by observing changes in symptom location or intensity**. Amin, D. I., Mohamed, G. I., & El Melanie, M. M et al.**

Repetition: 5 set with 10 second hold

Figure 1. Neck extension in sitting

Neck Flexion in Sitting

Procedure: In the McKenzie technique, for the starting position in the head flexion procedure involves in which the practitioner should ask the subject sitting or standing upright while gently tucking the chin toward the chest, as if trying to create a "double chin," without bending the upper back, in order to promote cervical spine flexion and assess or treat mechanical neck pain by centralizing symptoms or reducing pain**.(Chaiyawijit, S., & Kanlayanaphotporn, R et al.)**

Repetition: 5 set with 10 second hold

Figure 2. Neck Flexion in Sitting

Left and right lateral bending

Procedure: In McKenzie technique, procedure for left and right lateral bending exercise involves in which practitioner should ask the subject to sit in the upright with good posture and then slowly bending the neck sideways—first to the left, bringing the left ear toward the left shoulder, and then to the right—while keeping the shoulders relaxed and avoiding forward or backward tilting, in order to assess or treat mechanical neck pain and observe changes in symptom intensity or location**.Baumann, A., Orellana, K., Landis, L et al.**

Repetition: 5 sets with 10 second hold

Figure 3. Right side bending

Figure 4. Left side bending

Chin tucks in sitting

Procedure: In the McKenzie technique for the chin tuck starting position, procedure involves in which the practitioner should ask the subject to sit in or standing upright with good posture and then gently drawing the chin straight backward, as if trying to make a double chin, without tilting the head up or down, to promote cervical spine alignment and help centralize or reduce neck symptoms .**Baumann, A. N., Orellana, K., Landis, et al**.

Repetition: 5 sets with 10 second hold

Figure 5 . Chin tucks in sitting

Shoulder Shrugging

Procedure: In the McKenzie technique, for the starting position the shoulder shrugging procedure in the sitting position involves where the practitioner should ask the subject to sitting upright with a straight back and then slowly lifting both shoulders upward toward the ears in a shrugging motion, holding briefly, and then lowering them back down.**(Karthikeyan, S., Subramanian, A., Ramanathan et al.)**

Repetition: 5 set with 10 second hold.

Figure 6 . Shoulder shrugging

Group B : will receive a DTFM and a moist heat pack. Three day a week for total of eight week, treatment sessions will last forty-five minutes each. The data was collected using a pre- and post-questionnaire. Patients will sign consent documents. Calculations was performed using SPSS after data collection. Data analysis was carried out in accordance with the findings to ascertain whether one technique was more effective than the other for mechanical neck ache.

Hot Pack : Procedure: The procedure of applying a hot pack involves placing a warm, moist heat pack—usually wrapped in a towel or cover on affected area for 15 to 20 minutes to help relax muscles, improve blood flow, and reduce pain or stiffness**.(Türken, A., & Arca, M et al.)**

Figure 7. Hot Pack

TENS: Procedure: The procedure for TENS (Trans - Cutaneous Electrical Nerve Stimulation) placement in neck pain involves cleaning the skin, then placing two or four electrode pads on or around the painful area of the neck—typically on either side of the spine—avoiding bony prominence, and connecting them to the TENS unit, which is then set to a comfortable intensity to help reduce pain through electrical stimulation (**Toopchizadeh, V., Izadseresht, B., Eftekharsadat, B et al.)**

Figure 8. TENS

DTFM Technique

Procedure: The procedure of DTFM involves , therapist locating the affected tendon, ligament, or muscle and then applying firm, repetitive pressure across the grain of the tissue using the fingers or thumb, typically for 5–10 minutes, to break down adhesion's, promote circulation, and aid tissue healing while monitoring the patient's tolerance throughout the session**.(Singh, M. T., Anumula, M. S. K., Beku et al.)**

Figure 9 DTFM Technique

Figure 10 DTFM Technique

RESULT:

STATISTICAL SOFTWARE:

Statistical analysis was conducted both manually and using statistical software, including SPSS version 23. Microsoft Word and Excel were also utilized for generating tables, graphs, and other visual representations. A range of statistical metrics, including one-way ANOVA, standard deviation and mean was used to examine the scores of all participants included in the study.

Groups Comparison

An independent t-test was used to compare the effects on NPRS, FRI scale, and QOL (BERF) measures between Groups A and Group B. Based on the results, the group showing greater improvement was identified

Table 1 : To Analysis the difference in NPRS Scale between Group A and Group B

Duration	Group A Mean ±SD	Duration	Group B Mean ±SD	t-value	P- Value	Result
Baseline	5.65 ± 0.933	Baseline	5.55 ± 1.35	0.459	0.670	Insignificant
4 week	5.10 ± 0.852	4 week	4.50 ± 1.10			
8 week	3.150 ± 0.988	8 week	2.10 ± 1.07			

Table-1: Comparison between Group A and B showing Mean ±SD of **NPRS Scale** at 1 Day, week 4 and week 8 measurement.

To analyze the difference in the **NPRS Scale** between groups A and B, independent t test was used. The difference in all the intervention in group A at baseline, 4 week & 8 week Scores 5.65 ± 0.933, 5.10 ± 0.852, 3.150 ± 0.988 and group B are 5.55 ± 1.35, 4.50 ± 1.10, 2.10 ± 1.07 for baseline , 4 week and 8 week measurement.

The p-value was found to be larger than 0.05, suggesting no discernible change in NPRS pain scores between Groups A and B at baseline, week 4, and week 8. This suggests a statistically insignificant difference in NPRS assessments across the time points, leading to the accepting of e null hypothesis (H_0) and rejecting alternative hypothesis (H_1).However, based on mean scores Group B at baseline, weeks four and eight consistently showed lower values compared to Group A. This suggests that,Group B did not show a statistically significant difference, but demonstrated better pain reduction outcomes than Group A.

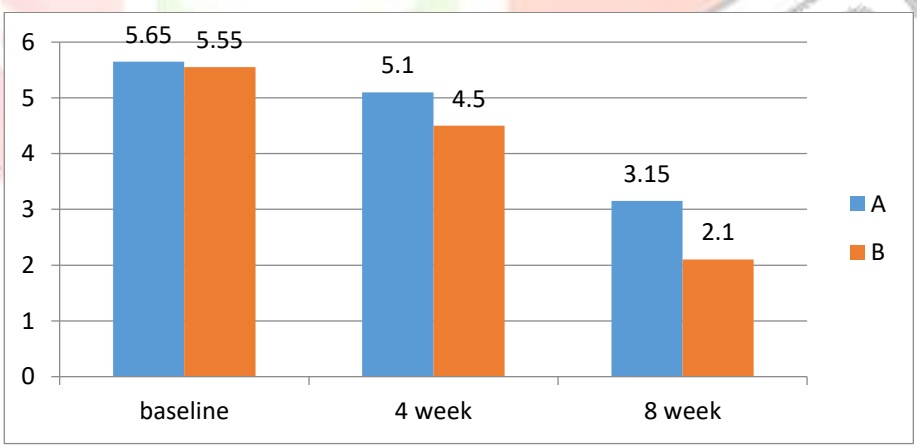

Figure.11 : Graphical representation of mean difference of NPRS Scale between Group A and Group B in baseline, week 4 and week 8

Table 2 :To Analysis the difference between FRI Scale in Group A and Group B

Duration	Group A Mean ±SD	Duration	Group B Mean ±SD	t-value	P- Value	Result
Baseline	2.15 ± 0.489	Baseline	2.35 ± 0.745	0.133	0.901	Insignificant
4 week	1.80 ± 0.523	4 week	1.90 ± 0.552			
8 week	1.10 ± 0.552	8 week	1.00 ± 0.561			

Table-2: Comparison between Group A and B showing Mean ±SD of FRI Scale at baseline, week 4 and week 8 measurement.

To analyze the difference in the **FRI Scale** between groups A and B independent t test were used. difference in all intervention in group A at baseline, 4 week & 8 week Scores 2.15 ± 0.489, 1.80 ± 0.523, 1.10 ± 0.552 and group B are 2.35 ± 0.745, 1.90 ± 0.552, 1.00 ± 0.561 for baseline , 4 week and 8 week measurement.

The p-value was found to be greater than 0.05, indicating no statistically significant improvement in pain scores of the FRI Scale between Groups A and B at baseline, week 4, and week 8. This suggests that difference observed between groups is statistically insignificant, leading to the accepting null hypothesis (H_0) and rejecting alternative hypothesis (H_1).

However, based on the mean scores recorded at baseline, week 4, and week 8, Group B consistently showed lower values across all interventions compared to Group A. This suggests that, despite the lack of statistical significance, Group B demonstrated better functional outcomes than Group A.

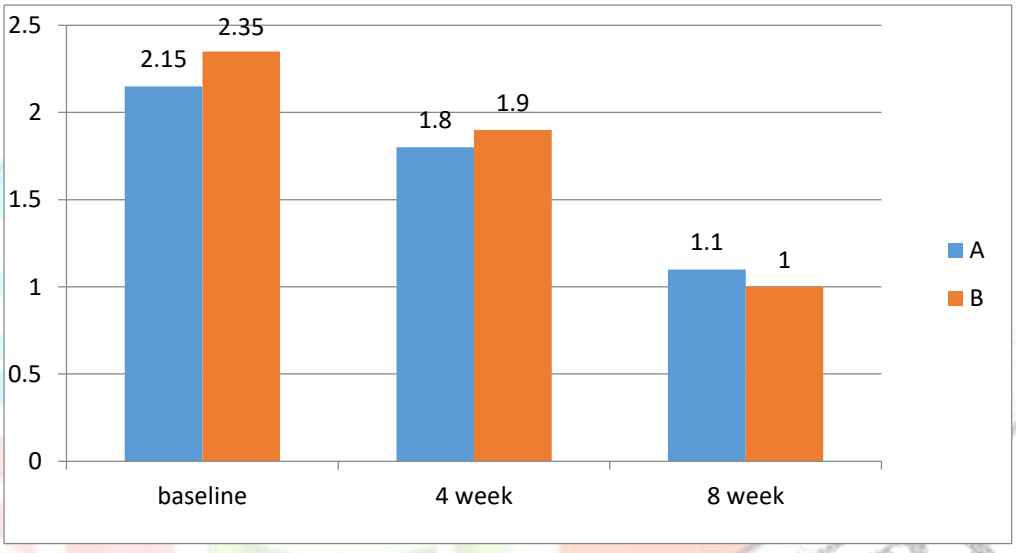

Figure 12 : Graphical representation of mean difference of FRI Scale between Group A and Group B in baseline, week 4 and week 8

Table 2:To Analysis the difference in QOL (BERF) measure between Group A and B .

Duration	Group A Mean ±SD	Duration	Group B Mean ±SD	t-value	P- Value	Result
Baseline	16.93 ± 1.683	Baseline	18.74 ± 2.99	0.676	0.536	Inignificant
4 week	21.11 ± 1.684	4 week	24.80 ± 3.75			
8 week	31.85 ± 2.77	8 week	44.52 ± 4.84			

Table-3: Comparing Groups A and B, the Mean ±SD of QOL is displayed. **(BERF) measure** at baseline, week 4 and week 8 measurement.

To analyze the difference in the Quality Of Life - BREF **measure** between group A and B, independent t test were used. Difference in all intervention in group A at baseline, 4 week & 8 week Scores 16.93 ± 1.683, 21.11 ± 1.684, 31.85 ± 2.77 and group B are 18.74 ± 2.99, 24.80 ± 3.75, 44.52 ± 4.84for baseline , 4 week and 8 week measurement.

The p-value was found to be greater than 0.05, indicating The pain scores did not differ statistically significantly. of the QOL (BERF) measure between Groups A and B at baseline, week 4, and week 8. This suggests that difference observed between groups is statistically insignificant, leading to accepting null hypothesis (H_0) and rejecting alternative hypothesis (H1).

However, based on the mean scores at baseline, week 4, and week 8, Group B consistently showed higher average values across all interventions compared to Group A. This suggests that, despite the lack of statistical significance, Group B demonstrated better outcomes than Group A in terms of improvement.

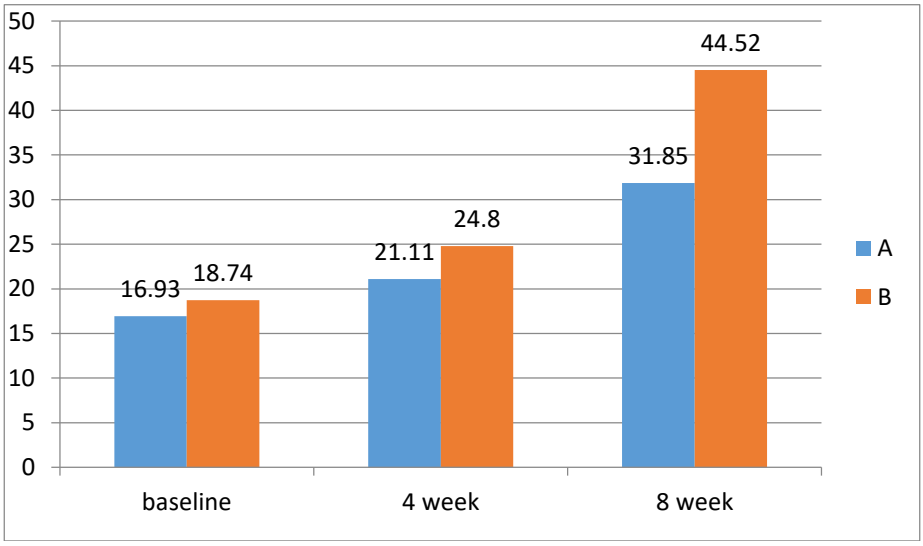

Figure 13: Graphical representation of mean difference of (QOLBREF) Scale between Group A and Group B in baseline, week 4 and week 8

DISCUSSION:

Mechanical One common musculoskeletal problem that often occurs is neck pain. brought on by poor posture, repetitive strain, and muscle imbalances, especially in individuals engaged in sedentary lifestyles or desk-bound occupations. It is typically characterized by localized neck discomfort, restricted range of motion, and functional limitations, but without neurological involvement. Effective management strategies are crucial to reduce disability, improve quality of life, and prevent chronicity.

The present study aim to compare the effectiveness of Mckenzie Technique versus Deep Transverse Friction Massage with conventional therapy in mechanical neck pain . A Total 40 participants were recruited based on the inclusion and exclusion criteria and the result was collected through the NPRS, FRI and WHO- QOL

In present study NPRS, FRI and QOL scores were obtained from the participants with mechanical neck pain in both Groups A and Group B. After obtaining the data , the treatment was given to participants according to their groups and then again after 4 week in mid treatment data were collected in data sheet then again after 8 the data were collected in data sheet and by comparing the two groups, the analysis were done.

A comparative study was done by **Khyati Varshney et al** stating that A comparative study has been done to see the comparative effect of positional release therapy and deep transverse friction massage to reduce pain and disability at cervical spine. The study was done on 30 patients were equally divided in to two groups (Group A and Group B). The NPRS and NDI were used for measuring the pain and disability at cervical region of spine. Total duration was 4 weeks while pre and post measurement had taken 1st day and 28th day respectively. Within the group pre and post values were assessed by unpaired t' test in both the groups which has mentioned in (Table- 3). In group A, P-value was significant i.e. $P<0.05$ with NPRS score as well as NDI score (0.001) and (0.003) respectively whereas group B shows P-value i.e. $P<0.05$ with NPRS score as well NDI score (0.053) and (0.081) respectively seeing the values the study shows that this technique found more improvement to increase in reducing pain and disability as compared to that technique. This study concluded that both therapies were effective in reducing pain and disability, but on comparison, positional release therapy was more effective than deep transverse friction massage in term of improvement of pain and disability at the level of 5% significance.

In comparision to previous studies the current findings support the view that manual soft tissue techniques play a key role in early-stage symptom management and functional recovery.46 people in all were first signed up for the study; however, 6 participants dropped out due to various reasons, including non-compliance and loss to follow-up. The final analysis was conducted on 40 participants who completed the intervention based on the mean scores assessed at baseline, week 4, and week 8, Group B (DTFM group) consistently demonstrated higher average improvements across all outcome measures, including pain (NPRS), functional disability (FRI) and activities of daily living, compared to Group A (McKenzie group). Although the results did not reach statistical significance which mean the p value is greater than 0.05, the trend suggests that Group B experienced relatively better clinical outcomes.

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FINANCIAL SUPPORT AND SPONSORSHIP
Nil
CONFLICT OF INTEREST
Conflicting Interest (If present, give more details): - Nil

CONCLUSION:

This study's goal was to assess the effectiveness of of deep transverse friction massage and the McKenzie technique in treating mechanical neck discomfort when used in conjunction with conventional therapy. One treatment out performed the other in terms of lowering pain intensity, increasing cervical range of motion, and improving functional capacity, according to the results, which show a distinction between the two that is statistically significant procedures. In order Patients with mechanical neck discomfort can have less pain and better function. The DTFM technique in conjunction with conventional therapy is found to be more effective then McKenzie Technique in conjunction with conventional therapy. Thus, in practical practice, the DTFM approach might be regarded as a better way to manage mechanical neck pain.

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