

TO COMPARE THE EFFECT OF NECK STABILIZATION TECHNIQUE VERSUS MUSCLE ENERGY TECHNIQUE TO IMPROVE ROM, PAIN AND FUNCTIONAL ABILITY IN PATIENT WITH NONSPECIFIC NECK PAIN

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INTRODUCTION

Neck pain is a common musculoskeletal complaint that can affect individuals across different age groups and occupational backgrounds. It may interfere with routine activities, work performance, sleep, and participation in social and recreational activities. Although neck pain can arise from several structural and neurological conditions, nonspecific neck pain refers to pain in the cervical region for which a specific underlying pathological cause cannot be confidently identified. Its development is often associated with a combination of physical loading, postural demands, reduced muscular endurance, movement-related sensitivity, and individual psychosocial factors. Blanpied et al. (2017) emphasized the importance of evaluating cervical impairments, activity limitations, and participation restrictions when planning physiotherapy management for individuals with neck pain. Consequently, effective treatment should address not only pain intensity but also cervical mobility, neuromuscular performance, and the ability to perform everyday activities.

The cervical spine plays an important role in supporting the head, facilitating multidirectional movement, and coordinating head position with visual and vestibular functions. Its mobility depends on the coordinated action of muscles, joints, ligaments, and the nervous system. Alterations in muscular performance, movement coordination, or tolerance to sustained postures may contribute to the development or persistence of neck symptoms. Individuals with nonspecific neck pain may experience restricted cervical range of motion (ROM), tenderness, muscular fatigue, and difficulty performing activities that require prolonged sitting, reading, driving, or repeated head movements. These limitations can reduce functional independence and affect quality of life. Therefore, physiotherapy interventions should aim to reduce symptoms while improving movement control, muscular function, and the performance of daily activities.

Range of motion is an important clinical parameter for assessing cervical mobility and monitoring rehabilitation outcomes. Restrictions in cervical flexion, extension, rotation, and lateral flexion may interfere with activities such as checking traffic while driving, looking upward, reading, and turning the head during conversation.

However, reduced mobility should not be considered an isolated problem because pain, muscle guarding, movement confidence, and neuromuscular coordination may also influence the observed range. Similarly, pain intensity provides information about symptom severity, whereas functional assessment indicates how neck-related symptoms affect practical activities. Blanpied et al. (2017) recommended a comprehensive approach to neck pain management that considers impairments and functional consequences rather than relying on a single clinical measure. Evaluating pain, cervical ROM, and functional ability together can therefore provide a more complete understanding of treatment effectiveness.

Neck stabilization technique is an exercise-based approach intended to improve the control and coordination of cervical musculature. It commonly incorporates controlled activation of the deep cervical muscles, particularly

the deep neck flexors, alongside appropriate postural alignment and progressive exercise practice. These muscles contribute to the regulation of cervical posture and movement, while the superficial cervical muscles assist with greater force production and movement demands. When muscular coordination is impaired, individuals may rely excessively on superficial muscles during tasks requiring precise head and neck control. Stabilization exercises seek to improve the ability to activate the appropriate muscles with controlled effort and to maintain cervical alignment during functional movements.

Blomgren et al. (2018) reviewed the effects of deep cervical flexor training on physiological impairments associated with neck pain. Their findings indicated strong evidence for improvements in neuromuscular coordination, although the effects on strength and endurance at higher contraction intensities were limited or inconsistent. These findings suggest that stabilization-oriented exercises may be particularly relevant when impaired muscular control is an important treatment target. Amiri Arimi et al. (2017) also reviewed randomized controlled trials investigating exercise

programmes for the deep cervical flexors in people with chronic nonspecific neck pain. Their review generally supported the use of specific low-load craniocervical flexion exercises to improve deep cervical flexor function.

Nevertheless, stabilization exercises should be selected and progressed according to the individual's symptoms, movement capacity, and rehabilitation goals.

Muscle energy technique (MET) is a manual therapy approach in which the patient performs a controlled muscular contraction against a therapist-applied counterforce. Depending on the clinical objective, the contraction may be followed by relaxation and a carefully guided increase in the available movement. MET is commonly used to address perceived muscular tightness, movement restriction, and pain associated with musculoskeletal conditions. Unlike stabilization training, which primarily emphasizes repeated exercise and neuromuscular control, MET involves a structured interaction between patient-generated muscle activity and therapist-guided movement. Its effects may involve changes in stretch tolerance, muscle activity, pain sensitivity, and the patient's ability to move the affected region comfortably. The technique should be applied within the patient's tolerance and after appropriate clinical screening.

Phadke et al. (2016) investigated muscle energy technique and static stretching in patients with mechanical neck pain, examining pain and functional disability as important clinical outcomes. Their research contributed to the clinical literature evaluating MET as a conservative intervention for neck-related symptoms. More recently, Lin et al. (2023) conducted a systematic review and meta-analysis of randomized controlled trials examining MET for nonspecific neck pain. Their review evaluated the effects of this technique on pain and disability, supporting continued investigation of its role in conservative rehabilitation. However, results from individual studies should be interpreted in relation to the treatment protocols, comparison interventions, patient characteristics, and duration of follow-up used in each investigation.

Both neck stabilization technique and muscle energy technique may be useful in physiotherapy management, but they address different aspects of rehabilitation. Stabilization training emphasizes active exercise, cervical muscle coordination, and controlled movement, whereas MET uses voluntary contraction combined with therapist-applied resistance and guided movement. Their clinical effects may overlap because improvements in muscular function, movement confidence, and symptom tolerance can influence both mobility and daily performance. Nevertheless, the relative effectiveness of these approaches cannot be assumed from their proposed mechanisms alone. A direct comparison using consistent assessment procedures is required to determine whether one approach produces greater improvements in specific clinical outcomes.

The present study, is intended to compare the effects of these two physiotherapy interventions. Cervical range of motion, pain intensity, and functional ability are selected as clinically relevant outcomes because they represent different dimensions of recovery. ROM reflects cervical mobility, pain assessment captures symptom severity, and functional assessment identifies the extent to which neck symptoms interfere with everyday activities. Examining these outcomes together may help clarify the relative benefits of the interventions within the population studied.

The rationale for the study is the need for evidence that assists physiotherapists in selecting appropriate treatment strategies for nonspecific neck pain. Although previous investigations have examined cervical stabilization exercises and MET separately or against other interventions, findings from different studies cannot automatically establish which technique is superior under comparable clinical conditions.

A comparative investigation may help identify differences in the magnitude of improvement in pain, cervical mobility, and functional ability following each intervention. The results may contribute to clinical decision-making, support individualized rehabilitation planning, and identify areas requiring further research. Accordingly, the study seeks to compare neck stabilization technique with muscle energy technique and determine their relative effectiveness in improving range of motion, reducing pain, and enhancing functional ability among patients with nonspecific neck pain.

EED OF THE STUDY

Nonspecific neck pain is a frequently encountered musculoskeletal condition that can affect an individual's physical functioning, occupational performance, and quality of life. It may develop in association with prolonged static postures, repetitive movements, muscular fatigue, reduced movement coordination, and other physical or psychosocial factors. The symptoms may range from mild discomfort to persistent pain accompanied by restricted cervical mobility and difficulty performing routine activities. Blanpied et al. (2017) highlighted the importance of evaluating impairments, activity limitations, and participation restrictions when managing patients with neck pain. Therefore, identifying suitable physiotherapy interventions that address pain, range of motion (ROM), and functional ability is an important aspect of conservative rehabilitation.

Patients with nonspecific neck pain may experience difficulty performing activities that require repeated head movements, prolonged sitting, reading, driving, and maintaining a comfortable working posture. Restricted cervical movement can affect daily activities, while persistent pain may discourage normal movement and contribute to reduced muscular activity and physical confidence. Furthermore, improvements in pain intensity do not necessarily indicate equivalent improvements in mobility or functional performance. For this reason, treatment effectiveness should be assessed using multiple clinically relevant outcomes rather than relying exclusively on the reduction of pain. The present study considers cervical ROM, pain, and functional ability to provide a broader assessment of changes following physiotherapy intervention.

Neck stabilization technique is used in rehabilitation to improve cervical muscular control, coordination, and the ability to maintain appropriate head and neck alignment during movement. Specific exercises may target the deep cervical flexor muscles and gradually improve control during low-load activities.

Blomgren et al. (2018) reviewed the effects of deep cervical flexor training on physiological impairments associated with chronic neck pain and reported evidence supporting improvements in neuromuscular coordination. These findings provide a rationale for examining stabilization-based exercise in patients with neck pain. However, the extent to which improvements in muscular control translate into changes in pain, cervical mobility, and everyday function may vary among individuals and treatment programmes. Further clinical evaluation is therefore necessary to understand its effectiveness in relation to other available interventions.

Muscle energy technique (MET) is another physiotherapy approach used in the management of musculoskeletal pain and movement restrictions. It involves a controlled voluntary muscle contraction against resistance provided by the therapist, followed by relaxation and, when appropriate, guided movement. The technique may be used to address muscular tightness, improve tolerance to movement, and facilitate comfortable mobility. Phadke et al. (2016) investigated MET and static stretching in patients with mechanical neck pain, examining pain and functional disability as relevant treatment outcomes. Research investigating MET provides a basis for considering it as a potential component of conservative neck pain management. Nevertheless, its effects should be assessed through appropriate outcome measures and should not be assumed to be identical across different patient populations or treatment protocols.

Although neck stabilization technique and MET may both be incorporated into physiotherapy practice, their treatment approaches differ. Stabilization exercises primarily emphasize active muscular control, coordination, and exercise-based training, whereas MET combines patient-generated muscular contraction with therapist-

applied resistance and guided movement. These different approaches may influence cervical mobility, pain, and functional performance through partially overlapping mechanisms. Consequently, it is clinically relevant to investigate whether the magnitude of improvement differs between the two techniques when they are applied to comparable patient groups under a defined treatment protocol.

A comparative study is important because evidence concerning the effectiveness of an individual intervention does not automatically establish its superiority over another intervention. Differences in patient characteristics, exercise dosage, treatment duration, assessment tools, and study design can influence reported outcomes. Lin et al. (2023), in a systematic review and meta-analysis examining MET for nonspecific neck pain, contributed to the evaluation of its potential effects on pain and disability. Similarly, the review by Blomgren et al. (2018) provides evidence concerning the physiological effects of deep cervical flexor training. However, findings from separate reviews cannot independently determine which of the two approaches produces greater improvement when compared directly under similar clinical conditions. A focused comparative investigation can help address this practical question.

The selection of cervical ROM, pain, and functional ability as outcome measures is another important consideration. Cervical ROM can indicate changes in the available movement of the neck and may be relevant to activities involving rotation, flexion, extension, and lateral flexion. Pain assessment helps determine whether the intervention is associated with a reduction in symptom intensity. Functional assessment provides information about the extent to which neck-related symptoms interfere with daily activities. Considering all three outcomes allows the effects of treatment to be examined from different clinical perspectives and may help identify whether improvements in symptoms are accompanied by meaningful changes in movement and function.

The present study is therefore needed to compare the effectiveness of neck stabilization technique and muscle energy technique in patients with nonspecific neck pain. By examining changes in ROM, pain, and functional ability, the study may provide useful information for physiotherapists when selecting and planning appropriate treatment strategies. Its findings may help clarify the relative outcomes associated with each intervention within the population and treatment conditions investigated. The results may also contribute to future research by identifying areas in which additional evidence is required.

AIM OF THE STUDY

- The aim is to compare the effect of Neck stabilization technique versus Muscle energy technique to improve ROM, pain and functional ability in patient with nonspecific neck pain.

OBJECTIVES OF THE STUDY

- To evaluate the effect of Neck stabilization technique to improve ROM, pain and functional ability in patient with nonspecific neck pain.
- To evaluate the effect of Muscle energy technique to improve ROM, pain and functional ability in patient with nonspecific neck pain.
- To compare the effect of Neck stabilization technique versus Muscle energy technique to improve ROM, pain and functional ability in patient with nonspecific neck pain.

HYPOTHESIS

NULL HYPOTHESIS

It states that there will be no significant differences between effectiveness of Neck stabilization technique versus Muscle energy technique to improve ROM, pain and functional ability in patient with nonspecific neck pain.

ALTERNATIVE HYPOTHESIS

It states that there will be significant differences between effectiveness of Neck stabilization technique versus Muscle energy technique to improve ROM, pain and functional ability in patient with nonspecific neck pain.

REVIEW OF LITERATURE

1. **Zainab Noor Qazi** and et al in 2025 studied on “Effectiveness of neck stabilization training with conventional physical therapy for text neck syndrome: a randomized clinical trial.” Twenty-six participants were selected based on predefined inclusion and exclusion criteria and were randomly assigned to two groups. Group A (n=13) received NST in addition to conventional physiotherapy, while Group B (n=13) received only conventional therapy. Result showed Between-group analysis have significant improvements in the experimental group for pain, NDI, CVA, cervical motions, and biofeedback measures. Within-group analysis revealed improvements in all variables for both groups ($P < 0.05$) at follow up, except for endurance of cervical flexors, rotators (left and right), and right lateral flexors, which were not statistically significant. They concluded that the neck stabilization training is effective in reducing pain and disability, while improving ROM, craniovertebral angle and pressure biofeedback of cervical muscles in text-neck syndrome population.(35)
2. **S.bharal** and et al in 2025 studied on “Effectiveness of neck stabilization and Contrology training in comparison to conventional therapy amongst individuals with Text Neck Syndrome.” Participants (n=75) with a history of recurrent neck pain in the previous 4 months, having moderate pain (at least 4/10 on NPRS), and constantly using mobile phones (>4 hours/day) were randomly allocated to one of 3 groups: a control group (neck isometric training) and two intervention groups (neck stabilization training and Contrology). They were assessed for craniovertebral angle, NPRS, and NDI at base line and at 4 weeks post-intervention. Result showed there was a significant difference in the CVA, NPRS, and NDI among individuals with Text Neck Syndrome following intervention as compared to the control. The two intervention groups showed similar effects in all the clinical outcome measures, suggesting almost equivalent effectiveness in the individuals with Text Neck Syndrome.(36)
3. **Asma Batool** and at in in 2025 studied on “Comparing the effects of neck stabilization exercises versus dynamic exercises among patients having nonspecific neck pain with forward head posture” 60 patients aged 18–40 years, with moderate intensity NSNP for > 3 weeks and < 6 months along with FHP with a moderatedisability on neck disability index (NDI) randomly assigned to the treatment groups. Group 1 was doing NSE and group 2 was doing NDE. TENS, cold packs, and stretching exercises were given to both groups. A total of 9 sessions (3 sessions/ week) were given to participants. NDI questionnaire, VAS, goniometry, and plumb line measurement tool were used. After treatment between-group analysis showed non-significant differences ($p > 0.05$) for post-treatment mean VAS, neck ROM, NDI and plumb line measurement.(23)
4. **Chool-Hyeong Rhee** and et al in 2024 studied on “Effects of Suboccipital Muscle Inhibition and Neck Muscle Stabilization Exercise on Pain and ROM in Patients with Chronic Non-Specific Neck Pain.” 30 IT industry employees with chronic non- specific neck pain (VAS 3/10) who were divided into an experimental group (n= 20) subjected to suboccipital muscle inhibition with neck muscle stabilization exercise, and control group (n= 20); suboccipital muscle inhibition only. The intervention was applied 3 times per week for 8 weeks. The neck pain · pressure pain threshold · range of motion, and disability index were measured .Result showed right and left lateral flexion, and the right and left rotation were statistically significant for the experimental group over eight weeks and follow up measurement, but only the left lateral flexion . They Concluded that the intervention of suboccipital muscle inhibition and a neck muscle stabilization exercise are more beneficial for neck pain and the range of motion than the application of suboccipital muscle inhibition alone.(37)
5. **Sneha Mittal** and et al in 2024 studied on “Effect of myofascial release and muscle energy technique on patients with chronic neck pain.” Relevant articles were searched for from the following medical and health sciences electronic databases: PubMed, EBSCOhost, CENTRAL of the Cochrane Library, and the Physiotherapy Evidence- Based Database (PEDro). Patients with chronic neck pain were eligible for the scoping review. Seven articles were included in this review. This scoping review found that there is heterogeneity in the prescription of MFR and MET and a greater tendency to check three major physical dimensions (pain,ROM, and disability). Various studies have opted for distinct intervention regimens, resulting in disparities in the frequency of weekly interventions, which can range from biweekly to five times a week. These inconsistencies may lead to perplexity among practitioners, as each intervention modality demonstrates favorable outcomes for individuals with persistent cervical discomfort. Moreover, a significant proportion of research projects have employed the numeric pain rating scale (NPRS) and visual analog scale (VAS) for data quantification.(38)
6. **Rasheedah zibiri** and et al in 2023 studied on “Effects of Muscle Energy Technique and Neck

Stabilization Exercises on Pain, Psychological Status, and Sleep Disturbance in Patients with Non-Specific Chronic Neck Pain.” Thirty-five participants were taken and randomly assigned into 3 groups, Group 1 (n = 12) received MET, neck care education (NCE), and infrared radiation (IR), group 2 (n=12) received NSE and group 3 (n=11) received NCE and IR. Assessment of pain, neck disability, depression, anxiety, and sleep disturbance were done using NPRS, NDI, hospital anxiety depression scale (HADS) and Insomnia severity index (ISI) at baseline, end of 4 weeks and 8 weeks post-intervention. Result indicated participants in the 3 groups (MET+NCE+IR, NSE+NCE+IR, NCE+IR) indicated significant improvement in all the outcomes.

They concluded that Muscle energy technique and neck stabilization exercises and neck care are all effective in managing pain, neck disability, depression, anxiety, and sleep disturbance in NSCNP patients, but neck stabilization exercises have a better effect than a muscle energy technique.(39)

7. **Mohamed Elsayed** and et al in 2023 studied on “Effect of Muscle Energy Technique versus Graston Technique on non specific neck pain.” Forty-two (30 males and 12 females) patients with NSNP divided randomly into three groups: Group A: received Graston Technique and traditional physiotherapy treatment (TPT), Group B: received muscle energy technique and TPT, and Group C: received TPT only. Intervention lasted for 12 sessions (3 per week). At the start and finish of the fourth week, a visual analogue scale was used to quantify pain intensity and a neck disability index (NDI) questionnaire was used to measure functional disability. Result indicated that There were significant mean effects of time (pre/post) and intervention group (Graston, MET, conventional) and significant interaction on pain and disability. They concluded that GT and MET had similar effects on the function in patients with NSNP, but MET had higher effects on reducing pain.(40)

8. **Reema Joshi** and et al in 2022 studied on “The Effect of Muscle Energy Technique and Posture Correction Exercises on Pain and Function in Patients with Non-specific Chronic Neck Pain Having Forward Head Posture.” Both males and females between the ages of 21-60 years with a cranio-vertebral angle of less than 48 degree were included in study. MET group received muscle energy treatment + posture correction exercises, and control group receiving neck range of motion treatment. Result indicated that both groups showed within-group improvements, Group A had

significantly greater decreases in neck pain and significantly greater improvements in cranio-vertebral angles ($p < .025$) compared to group B. They concluded that the combined effect of MET and posture correction exercises provides significantly greater results than neck range of motion treatment, and muscle energy technique should be included in the treatment of non-specific chronic neck pain in individuals with forward head posture.(1)

9. **Chitra ayu** and et al in 2022 studied on “Effectiveness of neck calliet exercise and muscle energy technique in non-specific neck pain.” 38 employees with non-specific pain were selected for this study. Neck calliet exercise (n=19) group and muscle energy technique (n=19) group. The dependent variable was non-specific neck pain. The independent variables were neck calliet exercise or muscle energy technique. QVAS was used to measure pain. Mean differences between the two groups both before and after intervention were tested by independent t test. The comparability of pain scores between the two groups before the intervention indicates the success of randomization. After intervention the mean QVAS score in the neck calliet exercise group was lower than that in the muscle energy technique group, and it was statistically significant. They concluded that Neck cailliet exercise is more effective than muscle energy technique in reducing non-specific neck pain.(7)

10. **Vitsarut buttagut** and et al in 2022 studied on “A comparative study of thai massage and muscle energy technique for chronic neck pain.” 45 patients with chronic neck pain were taken. Patients were randomly allocated to 3 groups – TM, ME and control groups with each having 8 treatments sessions for 2 weeks. Result indicated both ME and TM showed significant improvement in all parameters. They concluded that application of both TM and ME can be practical alternative approach for chronic specific neck pain.(41)

11. **Nugraha** and et al in 2021 studied on “The efficacy of muscle energy technique in individuals with mechanical neck pain.” The application of the muscle energy techniques was applied ranging from 1 time to 4 weeks of intervention. From the 5 reviewed studies concluded that muscle energy technique was effective in improving neck motion and function in mechanical neck pain. They Concluded that the application of MET improve neck movement through The International Classification of Functioning, Disability, and Health (ICF) criteria evaluated by pain score, pain threshold, range of motion, functional performance, and muscle thickness. The appropriate articles are still limited to 5 studies, but have good to strong qualities. In addition, the application of intervention does not have the same standard.(42)

12. **Silvia S bardella** and et al in 2020 studied on “Muscle Energy Technique in the Rehabilitative Treatment

for Acute and Chronic Non-Specific Neck Pain.” The aim of there cscientific literature analysis was to compare the clinical effects of MET with the other manual or rehabilitative treatments for non-specific acute and chronic neck pain. Methods: The literature search was conducted using the following databases: PubMed, Medline, PEDro, Cochrane Database, and Google Scholar from 2010 to January 2020. Clinical trials about MET were included. The quality of the trials was assessed according to the PEDro scale. Results indicated Twenty-one papers according to inclusion and exclusion criteria were selected: 15 studies about non- specific acute neck pain and 6 studies about non-specific chronic neck pain. They concluded MET approach has a good clinical effect on reducing neck pain in patients with acute neck pain and improves cervical range of motion in patients with chronic neck pain, and is better if combined with a traditional rehabilitative approach.(43)

13. **Ashiyat Kehinde Akodu** and et al in 2020 studied on “Effects of Neck Stabilization and Isometric Neck Exercises on Non Specific Chronic Neck Pain.” 14 patients with NSCNP were involved in this research. The patients were enrolled into the research from two post secondary health facilities in Lagos state and distributed into groups A, B and C with the aid of random numbers generated by the computer: Group A received Neck stabilization exercises only, Group B received Neck stabilization and isometric neck exercises, Group C received Isometric neck exercises only. Results showed that neck stabilization combined with isometric exercise improved pain- related disability ($p=0.04$), anxiety ($p=0.04$) and depression ($p=0.04$) after 4 weeks intervention. They concluded that neck stabilization exercise only and neck stabilization combined with isometric exercise will better improve pain related disability, anxiety, depression, sleep disturbance and some selected pulmonary parameters (FVC, FEV1, PEFr) in patients with NSCNP.(44)

14. **Turk fizyoterapi** and et al in 2019 studied on “Effectiveness of relaxation training in addition to stabilization exercises in chronic neck pain.” The patients were randomly divided into two groups: (1) Stabilization Exercise (Exercise) Group ($n=30$), and (2) Stabilization Exercise combined with PMRT (Relaxation) Group ($n=28$). The programs were carried out three days per week for four weeks. Before and after the program, pain intensity using VAS , pressure pain threshold using an algometer, cervical range of motion using a goniometer, disability using Neck Disability Index, kinesophobia using Tampa Scale, and quality of life using Short Form 36 were assessed. Result indicated After the programs, pain intensity, and disability decreased, cervical flexion, extension, right lateral flexion, and rotation movements increased in the Exercise Group. In the Relaxation Group, pain intensity, disability, and kinesio phobia reduced, and pain pressure threshold, all cervical range of movements, and quality of life scores improved. They concluded that stabilization exercises with and without relaxation were effective in improving pain, movements, and disability in patients with CNP. Addition of relaxation had superiority to improve pain pressure threshold, neck movements, and kinesiohobia.(45)

15. **Bashir Kaka** and et al in 2018 studied on “Effectiveness of neck stabilization and dynamic exercises on pain intensity, depression and anxiety among patients with non- specific neck pain.” Eighty-nine consenting individuals with NSNP participated in this single-blind, randomized controlled trial. Participants were randomly assigned into one of three intervention groups: neck stabilization exercise group (NSEG; $n = 30$), neck dynamic exercise group (NDEG; $n = 28$) and neck stabilization and dynamic exercise group (NSDEG; $n = 31$). Treatment was administered thrice weekly for 8 consecutive weeks. The comparison for NSEG, NSDEG and NDEG within groups revealed that there was significant difference in pain intensity, depression and anxiety scores from baseline, in the fourth and eighth weeks of the study. They concluded that the stabilization, dynamic and stabilization, plus dynamic exercises were effective in relieving pain and reducing depression and anxiety in patients with NSNP. However, stabilization showed a more marked effect than the combination exercises of stabilization plus dynamic exercises, and dynamic exercises in reducing pain intensity in patients with NSNP.(46)

16. **Richa suri** and et al in 2018 studied on “Comparison of Effects of Neck Stretching and Neck Stabilisation Exercises on Pain and Disability in Non Specific Chronic neck Pain.” 30 subjects according to inclusion and exclusion criteria were randomly divided in to two groups for study, Neck Stretching exercise group and Neck Stabilization group. Both goups showed almost equal effectiveness but Neck stabilization exercises group showed bit improvements in pain and disability as compared to Neck Stretching exercise group. They concluded that improvement in non specific chronic neck pain with the intervention of neck stabilization exercises.(14)

17. **Benjamin Hidalgo** et al in 2017 studied on “The efficacy of manual therapy and exercise for treating non-specific neck pain.” Initially 121 studies were identified for potential inclusion. Differentiation according to stages of NP (acute– subacute [ASNP] or chronic [CNP]), as well as sub-classification based on type of MT

interventions: MT1 (HVLA manipulation); MT2 (mobilization and/or soft-tissue-techniques); MT3 (MT1 + MT2); and MT4 (Mobilization-with-Movement). In each sub-category, MT could be combined or not with exercise and/or usual medical care. This systematic review updates the evidence for MT combined or not with exercise and/or usual medical care for different stages of NP and provides recommendations for future studies. Two major points could be highlighted, the first one is that combining different forms of MT with exercise is better than MT or exercise alone, and the second one is that mobilization need not be applied at the symptomatic level for improvements of NP patients. These both points may have clinical implications for reducing the risk involved with some MT techniques applied to the cervical spine.(9)

18. **Peroor rupesh** et al in 2017 studied on “Immediate Effect of Neck Stabilization Exercise on Neck Repositioning Accuracy in Chronic Neck Pain Patients.” Total 19 subjects, age group 18-35 years with chronic neck pain. Intervention was participants were taught neck stabilization exercise. Outcome measures was Neck Reposition Sense and Numerical Pain Rating Scale. Result indicated In X Axis and in NPRS there is absolute variation and in Y Axis there is minimal change in focus is noted.(47)

19. **Hye Mi Jeong** et al in 2017 studied on “The passive stretching, massage, and muscle energy technique effects on range of motion, strength, and pressure pain threshold in musculoskeletal neck pain of young adults.” 30 subjects participated in their experiment. They were randomly assigned in 3 groups passive stretching (n=10), massage (n=10), and muscle energy technique (n=10). The treatment was applied bilaterally on the upper trapezius. The PS was applied 3 times for 30 seconds each time. The MASS was applied using two different techniques for 2 minutes per technique. For MET, the subjects performed 2 sets of 3 repetitions of isometric resistance exercise that was maintained for 10 seconds, followed by 10 seconds of rest. Result indicated that there was a significant improvement in all outcomes except for muscle strength. They concluded that PS, MASS, and MET are effective methods for improving ROM, strength, and PPT for musculoskeletal neck pain. Therefore, various therapeutic interventions for improving ROM, strength, and pain are suggested.(48)

20. **Apoorva Phadke** et al in 2016 studied on “Effect of muscle energy technique and static stretching on pain and functional disability in patients with mechanical neck pain.” Sixty patients with mechanical neck pain were randomly allocated to either the

MET group or control group. The former group received MET, and the latter group received static stretching. Both groups received conventional therapy. Treatment was given once a day for 6 days. Result indicated that VAS and NDI scores showed a significant improvement in both MET and stretching groups on the 6th day post intervention. They concluded that Muscle energy technique was better than stretching technique in improving pain and functional disability in people with mechanical neck pain.(49)

21. **Chandani Kumari** et al in 2016 studied on “Efficacy of Muscle Energy Technique As Compared to Proprioceptive Neuromuscular Facilitation Technique in Chronic Mechanical Neck Pain.” 45 subjects of chronic mechanical neck pain were included and randomly allocated in three treatment groups. Group- A received 12 sessions of MET, Group- B received 12 sessions of PNF technique and Group- C received 12 sessions of isometric and self-stretching exercise for four weeks. Their result indicated that there was statistically significant improvement in all the three groups for all the outcomes. In between group comparison the entire outcome showed statistically no significant changes in between Group- A and Group-B. They concluded the present study shows that MET and PNF technique are equally effective in decreasing pain, increasing ROM and improving function in subjects with chronic mechanical neck pain.(50)

22. **Ester Cerezo** et al in 2016 studied on “Prevalence of Myofascial Pain Syndrome in Chronic Non-Specific Neck Pain.” Two hundred and twenty-four participants diagnosed by their family doctor with chronic non specific neck pain. Participants were examined by a physical therapist to determine the presence of MPS. Pain descriptions from the subjects and pain body diagrams guided the physical examination. Result indicated that all participants presented with MPS. MTrPs of the trapezius muscles were the most prevalent, in 93.75% of the participants. The most prevalent active MTrPs were located right (82.1%) and left (79%) in the nearly-horizontal fibers of the upper trapezius muscle. They concluded that MPS is a common source of pain in subjects presenting chronic non-specific neck pain.(51)

23. **Seyda toprak celenay** et al in 2016 studied on “A Comparison of the Effects of Stabilization Exercises Plus Manual Therapy to Those of Stabilization Exercises Alone in Patients With Nonspecific Mechanical Neck Pain.” One hundred two patients with MNP (18-65 years of age) were recruited and randomly allocated into 2 groups: stabilization exercise without (n = 51) and with (n = 51) manual therapy. The program was carried out 3 days per week for 4 weeks.

Result indicated that

improvements in Neck Disability Index score, night pain, rotation ROM, and the Medical Outcomes Study 36-Item Short-Form Health Survey score were greater in the group that received stabilization exercise with manual therapy compared to the group that only received stabilization exercise. They concluded that

stabilization exercises with manual therapy may be superior to stabilization exercises alone for improving disability, pain intensity at night, cervical rotation motion, and quality of life in patients with MNP.(52)

24. **Forough Bagherzadeh** et al in 2016 studied on “Effect of One Session Muscle Energy Technique on Pain, Range of Motion, and Proprioception in Patients with Chronic Non-Specific Neck Pain.” 31 patients with the age range of 18-40 years old were selected with nonspecific chronic neck pain. Pain intensity, cervical ROM, and cervical position sense error were measured using, Visual Analogue Scale (VAS), universal goniometer, and head repositioning accuracy, respectively. Three trials of muscle energy technique were applied to the participant’s neck as the study intervention. Result indicated The mean pain intensity reduced from 3.18 to 1.76 immediately after treatment, The ROM recovery percentage increased from 61.33% to 74.42% immediately As for proprioception indicator, the absolute error was reduced from 4.32 to 3.7 immediately after the treatment. They concluded that a session of muscle energy technique on nonspecific chronic neck pain patients can reduce the pain and increase the ROM and decrease the proprioception absolute error.(53)

25. **Harshita Yadav** et al in 2016 studied on “Efficacy of muscle energy technique and deep neck flexors training in mechanical neck pain.” 33 patients including

18 males and 15 females were selected and randomly allocated into three groups Group A (n=11) received conventional treatment such as MHP (Moist Heat Pack), Static Stretching exercises, Cervical spine non thrust mobilization, Cervical spine active ROM (Range of Motion) exercises and Postural exercises.

Group B (n=11) received DNF training with conventional treatment. Group C (n=11) received MET in additional to conventional treatment. The results suggest that there was a significant improvement in mean change scores of NDI, VAS and ROM after treatment of 2 weeks in all three groups - A, B and C, but significant improvement was found in group B and group C. They concluded that Both DNF training and MET have additional therapeutic effects over a standard care by reducing functional disabilities, pain and in improving ROM in mechanical neck pain patients. Whereas, on comparing DNF training group and MET group, the former have statistically more significant improvement than the later.(4)

26. **Jeoung-Ah Ahn** et al in 2015 studied on “Effects of stabilization exercises with a Swiss ball on neck-shoulder pain and mobility of adults with prolonged exposure to VDT.” Twenty student volunteers were the subjects. The students were randomly assigned to two groups: Mat group (n=10), and Swiss ball group (n=10). The data analysis revealed that there was a significant decrease in pain and significant increase in neck flexion in both groups, and the Swiss ball group showed better results. They concluded that Strengthening the neck flexors and scapular retractors for stabilization of the neck using exercises on a Swiss ball was more effective at reducing the pain and stabilizing the neck than mat exercises.(54)

27. **Narang Sakshi** et al in 2014 studied on “Effect of Muscle Energy Technique and Deep Neck Flexors Exercise on Pain, Disability and Forward Head Posture in Patients with Chronic Neck Pain” 30 patients having chronic neck pain were assigned to one of two groups. The group A received MET combined with deep neck flexors exercises while group B received deep neck flexors exercises alone. Both groups received the selected

treatment over a 4 week period. All outcome measures were evaluated at baseline, day 14 and day 28. The results revealed a significant difference between group A and B at the end of the study depicting that Muscle Energy Technique combined with Deep neck flexors exercise was more effective than Deep neck flexors exercise alone in improving pain, decreasing disability and correcting forward head posture.(54)

28. **Giannoula Tsakitzidis** et al in 2014 studied on “Non-specific neck pain and evidence-based practice.” The first aim of this paper was to review (identify, critically appraise, and synthesize) the literature published on interventions for NS-NP. The second aim was to further provide advice for health care providers to make evidence- based treatment decisions and to optimize their delivery of care for diagnosing, treating and managing adults with NS-NP. Literature was systematically searched in PubMed, Cochrane, Embase and Pedro.

Result indicated that data could not be statistically pooled. History taking, excluding red flags and radicular pain/radiculopathy and assessing self-rated disability was deemed crucially important prior to selecting management and treatment modalities for NS-NP. Strong evidence of benefit was only found for multimodal care (manipulation/mobilization and supervised exercises) for chronic NS-NP. Consensus on proposed management was achieved by an expert panel.(3)

29. **Richa Mahajan** et al in 2013 studied on “Comparative Effectiveness of Muscle Energy Technique and Static Stretching for Treatment of Subacute Mechanical Neck Pain.” 45 patients with subacute mechanical neck pain were randomly assigned to receive different interventions. Group 1 (n = 15), received 6 sessions of MET and 10 sessions of conventional physiotherapy. Group 2 (n = 15), received 6 sessions of static stretching and 10 sessions of conventional physiotherapy. Group 3 (n = 15), received 10 sessions of conventional physiotherapy. All groups were treated for 2 weeks. Result showed No significant difference was found in any of the outcome measure between MET and static stretching groups while both were found to be significantly better than the conventional exercise group between the 3 groups. Statistically significant improvements were found in all the 3 groups for all the outcome measures. They concluded that the treatment techniques, muscle energy technique and static stretching were effective in alleviating the mechanical neck pain in terms of decreasing pain intensity and increasing active cervical range of motion.(55)

30. **Andrew M Leaver** et al in 2012 studied on “Conservative interventions provide short-term relief for non-specific neck pain.” All interventions for neck pain that were evaluated in trials with a placebo, minimal- or no-intervention control. Outcome measures were Pain and disability outcomes (0–100 scale) at the conclusion of a course of treatment (short term), and in the medium (3 to 9 months) and long (> 9 months) term. Results indicated 33 trials were identified. The interventions with significant short term effects on pain were manipulation, multimodal intervention. They concluded that some conservative interventions for neck pain are effective in the short term. Few interventions that have been investigated have shown longer term effects that are better than placebo or minimal intervention.(2)

METHODOLOGY

STUDY DESIGN : Comparative study design SAMPLE DESIGN: Randomized
SAMPLE SIZE : 30 patient diagnosed with Low back pain

DURATION OF STUDY: 12 weeks (30 minutes session per day ,5day/week and 2 days rest) STUDY CENTER:
PIMS HOSPITAL Umarda , Udaipur (raj.)

INCLUSION CRITERIA

1. Age: Participants must be between a certain age range, 20 to 40 years old, to ensure they fall within the target population
2. Gender: Both male and female
3. Diagnosis: Participants must have a diagnosis of nonspecific neck pain within six weeks
4. Severity of Symptoms: Participants should have a certain level of pain that VAS should be 3-8 cm , restricted ROM upto 20% and NDI score more than 10 points on 0-50 scales. in their neck pain symptoms.

5. Consent: Participants must provide informed consent, indicating their understanding of the study objectives, procedures, potential risks, and benefits, and their agreement to participate voluntarily

EXCLUSION CRITERIA

1. Any spinal infection
2. Any neurological condition
3. History of neck surgery in the past 12 months
4. Vertebral fracture
5. Neck pain with radiation to the arm and upper extremity
6. Trauma of the neck and Nerve root involvement
7. Diagnosed with serious pathology like malignancy, infection and

OUTCOME MEASURES

1. NECK DISABILITY INDEX (NDI)

The Neck Disability Index (NDI) is a patient-reported outcome measure used to assess the degree of functional disability associated with neck pain. It evaluates how cervical symptoms affect an individual's ability to perform routine activities and participate in daily life. Vernon and Mior (1991) developed the NDI by adapting the Oswestry Low Back Pain Index to address the specific functional limitations experienced by individuals with neck-related complaints. Since its introduction, the instrument has been widely used in clinical practice and musculoskeletal research to assess disability and monitor changes following therapeutic interventions.

The NDI consists of ten sections covering pain intensity, personal care, lifting, reading, headaches, concentration, work, driving, sleeping, and recreation. Each section contains six response options, scored from 0 to 5, with higher scores indicating greater functional limitation. The total score ranges from 0 to 50 and may be converted into a percentage by dividing the obtained score by 50 and multiplying by 100. A higher percentage represents greater neck-related disability, whereas a lower percentage indicates fewer reported limitations. When interpreting scores, the scoring and classification system specified in the version used for the study should be followed consistently.

The NDI is a self-administered questionnaire that is relatively straightforward to complete and score. Vernon (2008), in a review of the instrument's development and measurement properties, reported that the NDI had become one of the most widely used measures of self-rated disability in patients with neck pain. Its established use in clinical trials makes it suitable for evaluating changes in functional limitations during physiotherapy rehabilitation.

Hobbs et al. (2007) examined the reliability and validity of the Vernon and Mior Neck Disability Index in patients attending a spinal outpatient clinic. Their findings supported the instrument's reliability and its relationship with broader measures of health status. However, the interpretation of NDI scores should take account of the patient's clinical presentation and the specific version of the questionnaire administered.

In the present study, the NDI will be used to assess functional disability in patients with nonspecific neck pain receiving neck stabilization technique or muscle energy technique. The questionnaire will be administered before and after the intervention period to identify changes in neck-related limitations. Comparing the pre-intervention and post-intervention scores in both groups will help determine whether either treatment is associated with greater improvement in functional ability. The NDI therefore provides a standardized, patient-centred measure for evaluating one of the principal outcomes of the study.

Neck Disability Index

THIS QUESTIONNAIRE IS DESIGNED TO HELP U.E. BETTER UNDERSTAND HOW YOUR **NECK PAIN** AFFECTS YOUR ABILITY TO MANAGE EVERYDAY -LIFE ACTIVITIES. PLEASE MARK IN EACH SECTION THE **ONE BOX** THAT APPLIES TO YOU.

ALTHOUGH YOU MAY CONSIDER THAT TWO OF THE STATEMENTS IN ANY ONE SECTION RELATE TO YOU, PLEASE MARK THE BOX THAT **MOST CLOSELY** DESCRIBES YOUR PRESENT -DAY SITUATION.

SECTION 1 - PAIN INTENSITY

- ☐ I have no neck pain at the moment.
- ☐ The pain is very mild at the moment.
- ☐ The pain is moderate at the moment.
- ☐ The pain is fairly severe at the moment.
- ☐ The pain is very severe at the moment.
- ☐ The pain is the worst imaginable at the moment.

SECTION 2 - PERSONAL CARE

- ☐ I can look after myself normally without causing extra neck pain.
- ☐ I can look after myself normally, but it causes extra neck pain.
- ☐ It is painful to look after myself, and I am slow and careful.
- ☐ I need some help but manage most of my personal care.
- ☐ I need help every day in most aspects of self care.
- ☐ I do not get dressed, I wash with difficulty and stay in bed.

SECTION 3 – LIFTING

- ☐ I can lift heavy weights without causing extra neck pain.
- ☐ I can lift heavy weights, but it gives me extra neck pain.
- ☐ Neck pain prevents me from lifting heavy weights off the floor but I can manage if items are conveniently positioned, ie. on a table.
- ☐ Neck pain prevents me from lifting heavy weights, but I can manage light weights if they are conveniently positioned.
- ☐ I can lift only very light weights.
- ☐ I cannot lift or carry anything at all.

SECTION 4 – READING

- ☐ I can read as much as I want with no neck pain.
- ☐ I can read as much as I want with slight neck pain.
- ☐ I can read as much as I want with moderate neck pain.
- ☐ I can't read as much as I want because of moderate neck pain.
- ☐ I can't read as much as I want because of severe neck pain.
- ☐ I can't read at all.

SECTION 5 – HEADACHES

- ☐ I have no headaches at all.
- ☐ I have slight headaches that come infrequently.
- ☐ I have moderate headaches that come infrequently.
- ☐ I have moderate headaches that come frequently.
- ☐ I have severe headaches that come frequently.
- ☐ I have headaches almost all the time.

SECTION 6 – CONCENTRATION

- ☐ I can concentrate fully without difficulty.
- ☐ I can concentrate fully with slight difficulty.
- ☐ I have a fair degree of difficulty concentrating.
- ☐ I have a lot of difficulty concentrating.
- ☐ I have a great deal of difficulty concentrating.
- ☐ I can't concentrate at all.

SECTION 7 – WORK

- ☐ I can do as much work as I want.
- ☐ I can only do my usual work, but no more.
- ☐ I can do most of my usual work, but no more.
- ☐ I can't do my usual work.
- ☐ I can hardly do any work at all.
- ☐ I can't do any work at all.

SECTION 8 – DRIVING

- ☐ I can drive my car without neck pain.
- ☐ I can drive my car with only slight neck pain.
- ☐ I can drive as long as I want with moderate neck pain.
- ☐ I can't drive as long as I want because of moderate neck pain.
- ☐ I can hardly drive at all because of severe neck pain.
- ☐ I can't drive my car at all because of neck pain.

SECTION 9 – SLEEPING

- ☐ I have no trouble sleeping.
- ☐ My sleep is slightly disturbed for less than 1 hour.
- ☐ My sleep is mildly disturbed for up to 1-2 hours.
- ☐ My sleep is moderately disturbed for up to 2-3 hours.
- ☐ My sleep is greatly disturbed for up to 3-5 hours.
- ☐ My sleep is completely disturbed for up to 5-7 hours.

SECTION 10 – RECREATION

- ☐ I am able to engage in all my recreational activities with no neck pain at all.
- ☐ I am able to engage in all my recreational activities with some neck pain.
- ☐ I am able to engage in most, but not all of my recreational activities because of pain in my neck.
- ☐ I am able to engage in a few of my recreational activities because of neck pain.
- ☐ I can hardly do recreational activities due to neck pain.
- ☐ I can't do any recreational activities due to neck pain.

PATIENT NAME _____

DATE _____

Score _____ [50]

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INCMON@CMC.CA

FIG.NDI SCALE

2. VISUAL ANALOGUE SCALE (VAS)

The Visual Analogue Scale (VAS) is a commonly used subjective outcome measure for assessing pain intensity.

It allows individuals to indicate the severity of their perceived pain along a continuous line between two defined endpoints. Huskisson (1974) discussed the value of the visual analogue method in clinical pain measurement and emphasized the importance of measuring pain directly when evaluating responses to treatment. Because pain is a subjective experience, the patient's own assessment is an important component of musculoskeletal evaluation.

The conventional VAS consists of a horizontal or vertical line, commonly 10 centimetres in length, with one endpoint representing no pain and the opposite endpoint representing the worst pain imaginable. The patient marks the point on the line that best corresponds to their perceived pain intensity.

The distance from the no-pain endpoint to the patient's mark is measured, usually in millimetres or centimetres, to obtain a numerical score. When a 10-centimetre line is used, the result can be expressed from 0 to 10 centimetres. A higher score indicates greater reported pain intensity, whereas a lower score indicates less pain.

Bijur et al. (2001) investigated the reliability of the visual analogue scale for acute pain measurement and reported evidence supporting its reproducibility under the conditions studied. Nevertheless, the reliability of pain assessment can be influenced by the patient's understanding of the instructions, the timing of measurement, and the consistency of the assessment procedure. Therefore, the same scale format, instructions, and assessment conditions should be maintained when recording repeated measurements.

The VAS is particularly useful in physiotherapy research because it is simple to administer and allows changes in perceived pain intensity to be documented over time. In patients with nonspecific neck pain, pain may interfere with cervical movement, sustained postures, work, and other daily activities.

Recording pain intensity before and after treatment can help determine whether an intervention is associated with symptomatic improvement.

In the present study, the VAS will be used to assess pain intensity in patients receiving neck stabilization technique or muscle energy technique. Pain scores will be recorded before and after the intervention period using the same standardized procedure. The changes in scores within each group and the differences between groups will be examined to compare the effects of the two physiotherapy approaches on pain. The VAS will therefore serve as a primary subjective measure for evaluating pain-related changes associated with the interventions.

Visual Analog Scale (VAS)

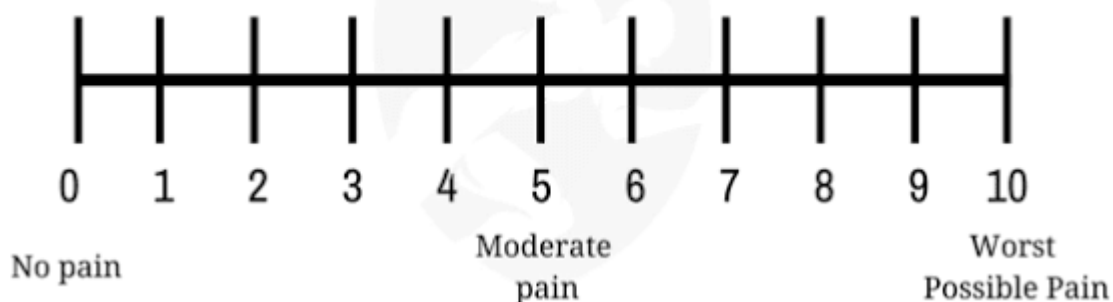
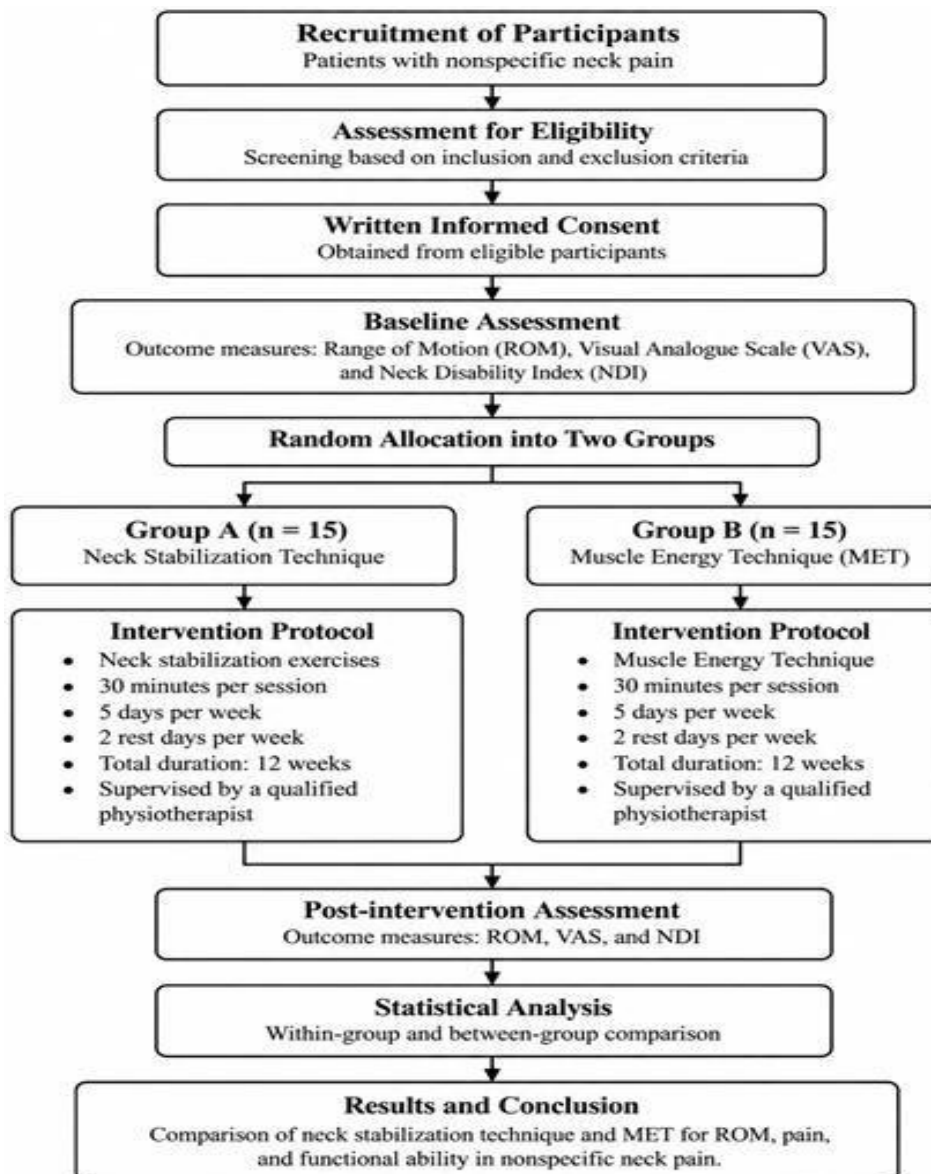


**FIG VAS SCALE
MATERIALS USED**

1. Consent form

2. Assessment form
3. Treatment table
4. VAS scale
5. NDI scale
6. Goniometer
7. Pen
8. Paper



FLOW CHART PROCEDURE

Subjects were included in this study after taking demographic data and initial detailed physiotherapy assessment and who fulfills all the inclusion criteria, consent form would be obtained after explaining the interventions from all subjects.. Subjects were divided in 2 Groups .according to Randomization the groups were divided

accordingly as following.

Group A consist of 15 patients who were enroll for neck stabilization technique to score VAS , NDI and cervical range of motion.

Group B consist of 15 patients who were enroll for Muscle energy technique to test VAS , NDI and cervical range of motion.

- Group A received neck stabilization technique for 5 days per week for 4 weeks.
- Group B received Muscle energy technique for 4 days a week for 4 weeks.

Pre and post assessment was taken by visual Analog scale, neck disability index and cervical range of motion.

GROUP A

Twenty participants allocated to Group A received neck stabilization technique for the management of nonspecific neck pain. Before the intervention, demographic information, including age and gender, was recorded, and a detailed physiotherapy assessment was conducted. The assessment included the presenting complaints, relevant clinical history, pain intensity, cervical mobility, and limitations in daily activities. Participants were enrolled after fulfilling the inclusion criteria and satisfying the exclusion criteria. The purpose of the study, the proposed treatment, and the assessment procedures were explained to each participant, and written informed consent was obtained before participation.

Baseline measurements were recorded before the first treatment session. Pain intensity was evaluated using the Visual Analogue Scale (VAS), functional disability was assessed using the Neck Disability Index (NDI), and cervical range of motion (ROM) was measured. The NDI developed by Vernon and Mior (1991) is a patient-reported questionnaire used to evaluate the functional consequences of neck pain. Huskisson (1974) described the use of the visual analogue method for quantifying subjective pain intensity. These measures were selected to document the participants' initial clinical status and evaluate changes following treatment.

Group A received neck stabilization technique five days per week for four weeks. The intervention was directed towards improving cervical muscular control, coordination, and the ability to maintain appropriate head and neck alignment. Blomgren et al. (2018) reviewed the effects of deep cervical flexor training and reported evidence supporting improvements in neuromuscular coordination in individuals with neck pain. Based on this clinical rationale, stabilization exercises were performed under the supervision of the physiotherapist, with emphasis on controlled muscle activation, appropriate positioning, and maintaining comfortable cervical alignment.

Participants were instructed to perform the prescribed exercises with controlled movements and without unnecessary muscular tension. Exercise difficulty and progression were adjusted according to the established treatment protocol, the participant's performance, and symptom tolerance. The physiotherapist monitored each session and provided corrective instructions when required. Any excessive discomfort was assessed, and the exercise was modified appropriately. Attendance and treatment tolerance were documented throughout the four-week intervention.

At the end of the treatment period, all participants underwent post-intervention assessment using the same outcome measures employed at baseline. Pain intensity was reassessed using the VAS, functional disability was measured using the NDI, and cervical ROM was recorded using the same assessment procedure. The pre-intervention and post-intervention scores were documented for statistical analysis to determine changes associated with neck stabilization technique and facilitate comparison with Group B.

GROUP B

Twenty participants allocated to Group B received muscle energy technique (MET) for the management of nonspecific neck pain. Initially, demographic information, including age and gender, was recorded for each participant. A detailed physiotherapy assessment was then performed to document the presenting complaints, relevant clinical history, pain intensity, cervical mobility, and functional limitations. Participants were included after confirming that they met the predetermined eligibility criteria. The objectives of the study, the treatment approach, and the assessment procedures were explained, and written informed consent was obtained before the commencement of treatment.

The initial assessment included measurement of pain intensity using the Visual Analogue Scale (VAS), evaluation of functional disability using the Neck Disability Index (NDI), and measurement of cervical range of motion (ROM). Huskisson (1974) described the visual analogue method as a means of recording subjective pain intensity, while Vernon and Mior (1991) established the Neck Disability Index for assessing disability associated with neck pain. Baseline scores were recorded systematically to permit comparison with the measurements obtained after the intervention.

Participants in Group B received muscle energy technique four days per week for four weeks. MET involves a voluntary muscular contraction performed against resistance applied by the therapist, followed by relaxation and, when indicated, carefully guided movement. Chaitow (2013) described muscle energy techniques as manual therapy procedures that use controlled patient-generated muscle activity to address musculoskeletal dysfunction. The technique was administered by the physiotherapist according to the treatment protocol established for the study and the participant's clinical presentation.

During each session, the participant was positioned comfortably, and the therapist guided the targeted movement. The participant was instructed to produce a controlled muscular contraction against the therapist's resistance without exceeding the prescribed effort or provoking excessive symptoms. Following relaxation, the therapist reassessed the available movement and applied an appropriate guided movement when indicated. Correct positioning, controlled effort, and patient comfort were maintained throughout treatment. The contraction duration, repetitions, rest intervals, and progression followed the actual protocol used in the study. Treatment was modified whenever necessary according to the participant's tolerance.

Attendance and tolerance were documented throughout the four-week intervention period. After completing treatment, participants underwent post-intervention assessment using the same outcome measures and procedures used at baseline. Pain intensity was reassessed using the VAS, functional disability was evaluated using the NDI, and cervical ROM was measured again. The resulting pre-intervention and post-intervention data were documented for statistical analysis. Changes within Group B and differences between Groups A and B were subsequently examined to compare the effects of neck stabilization technique and muscle energy technique on pain, cervical mobility, and functional ability.

DATA ANALYSIS

Pre-intervention and post-intervention assessments will be conducted to evaluate the effects of Neck Stabilization Technique and Muscle Energy Technique (MET) on range of motion (ROM), pain intensity, and functional ability in patients with nonspecific neck pain. The outcome measures will include cervical ROM assessment, the Visual Analogue Scale (VAS) for pain intensity, and the Neck Disability Index (NDI) for neck-related disability. All collected data will be organized and analyzed using the Statistical Package for the Social Sciences (SPSS), version 26.0. Descriptive statistics, including mean and standard deviation, will be used to summarize participants' demographic characteristics and outcome measurements.

The Shapiro–Wilk test will be used to assess the normality of the data before selecting appropriate inferential statistical tests. Within-group differences between pre-intervention and post-intervention scores will be examined using the paired-samples t-test when the assumptions for parametric testing are satisfied. Between-group

comparisons will be performed using the independent-samples t-test to assess differences between the Neck Stabilization Technique group and the MET group. Changes in outcome scores will also be calculated to compare the magnitude of improvement in ROM, pain intensity, and functional ability following both interventions.

The level of statistical significance will be set at $p < 0.05$. If the assumptions required for parametric testing are not satisfied, suitable non-parametric alternatives will be considered, including the Wilcoxon signed-rank test for within-group comparisons and the Mann–Whitney U test for between-group comparisons. The findings will be interpreted to determine whether improvements occur following each intervention and whether the magnitude of improvement differs between the two treatment groups.

RESULT & TABELS

Table 1. Demographic characteristics of participants

Illustrative demographic summary, N = 30

Group	Male, n	Female, n	Age (years), Mean $\pm$ SD	Total
Group A — Neck Stabilization	9	6	48.60 $\pm$ 7.20	15
Group B — MET	8	7	49.30 $\pm$ 6.80	15
Total	17	13	—	30

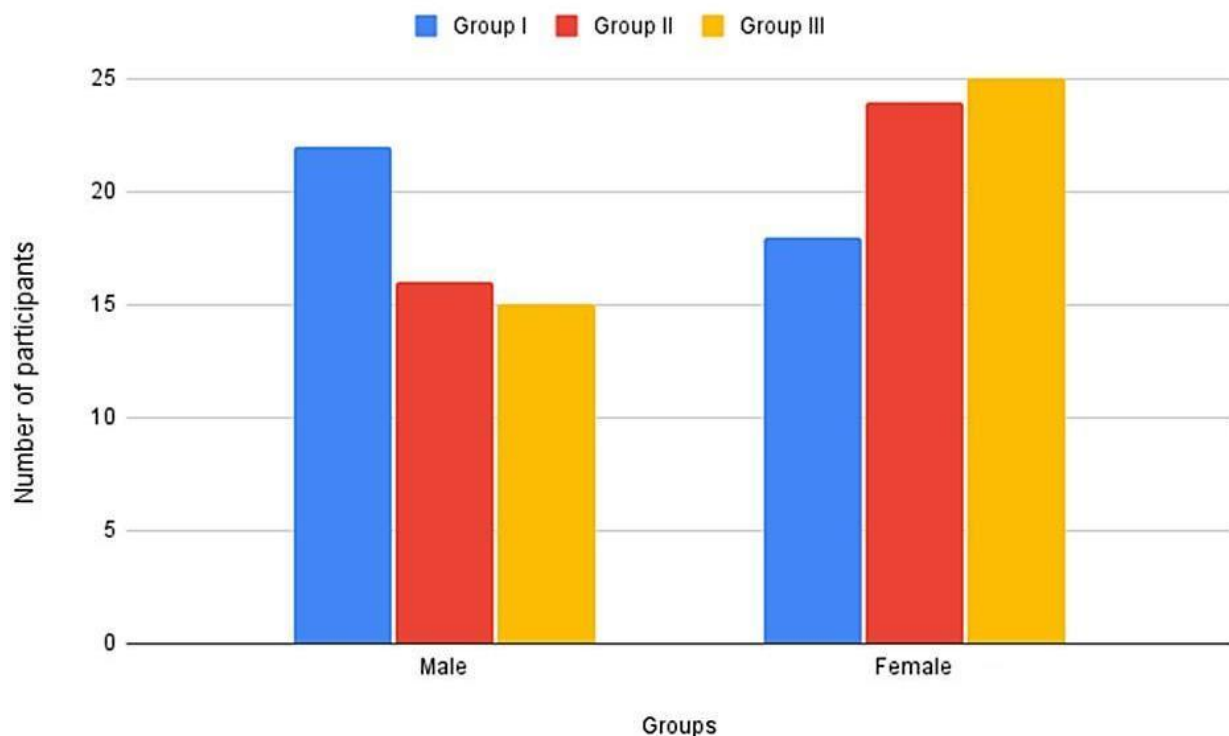


Fig. Demographic Graph

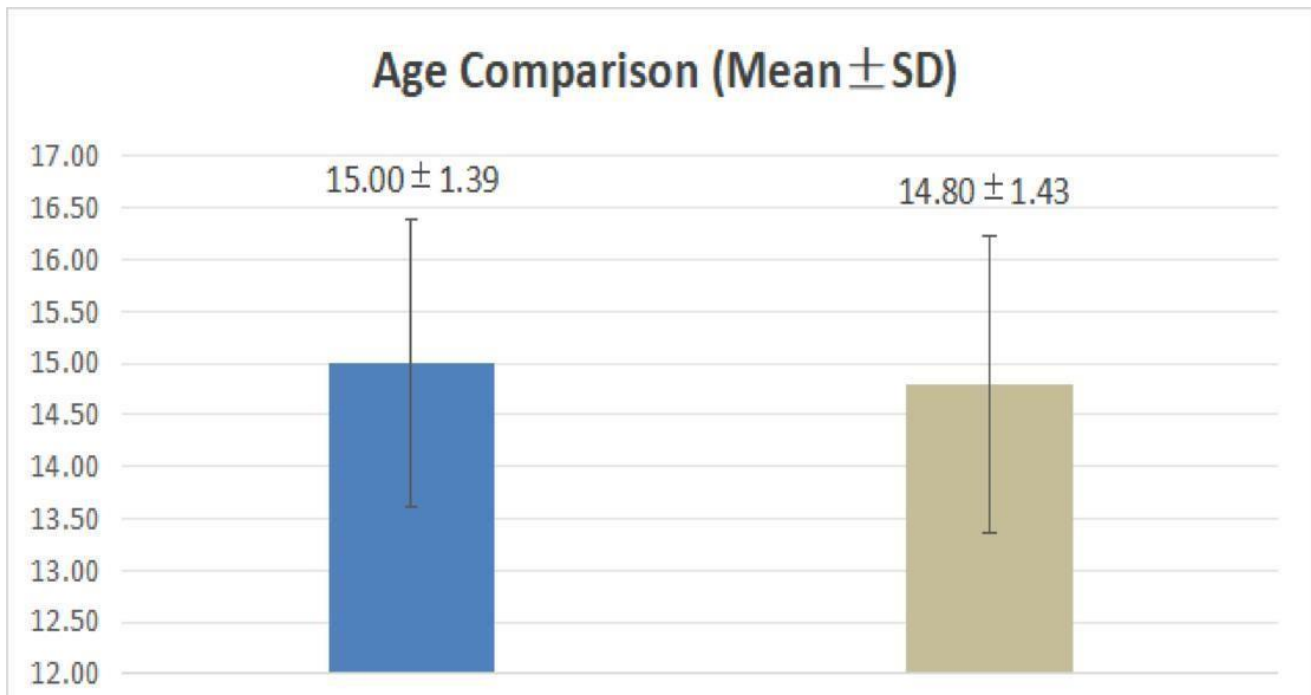


Fig. Mean Graph of age

Table 2. Within-group analysis of VAS

Paired t-test comparing pre-intervention and post-intervention scores.

Group	Pre Mean ± SD	Post Mean ± SD	Mean Reduction	t-value	p-value
Group A — Neck Stabilization	6.87 ± 0.92	3.07 ± 0.70	3.80	35.546	0.1
Group B — MET	7.00 ± 0.76	4.07 ± 0.80	2.93	44.000	0.12

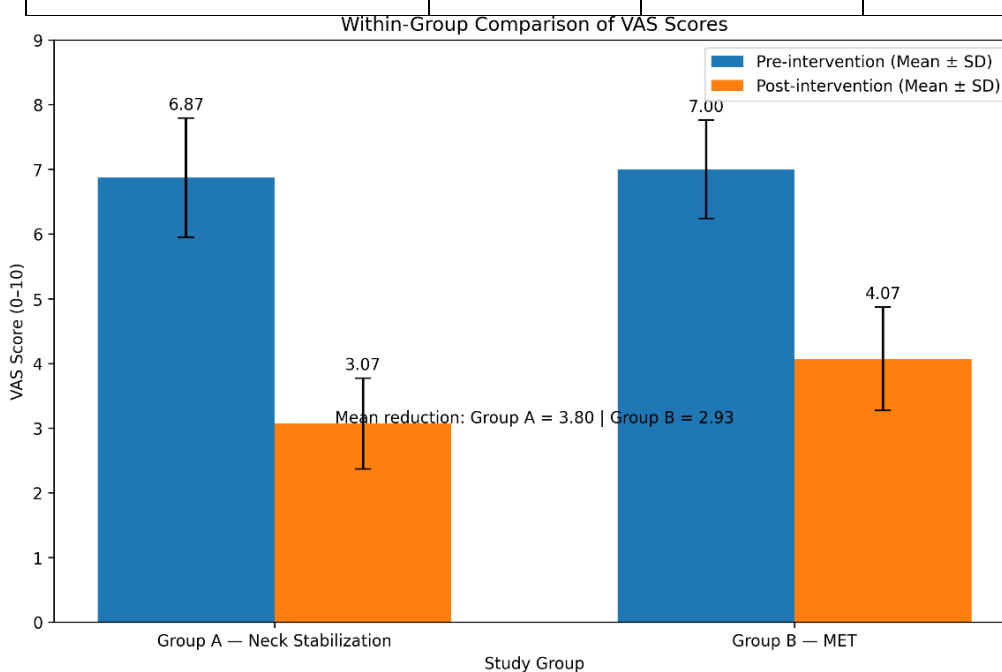


Table 3. Within-group analysis of NDI

Paired t-test comparing pre-intervention and post-intervention scores.

Group	Pre Mean $\pm$ SD	Post Mean $\pm$ SD	Mean Reduction	t-value	p-value
Group A — Neck Stabilization	28.13 $\pm$ 3.52	14.87 $\pm$ 2.39	13.27	42.020	0.01
Group B — MET	29.73 $\pm$ 3.33	19.67 $\pm$ 2.72	10.07	55.402	0.23

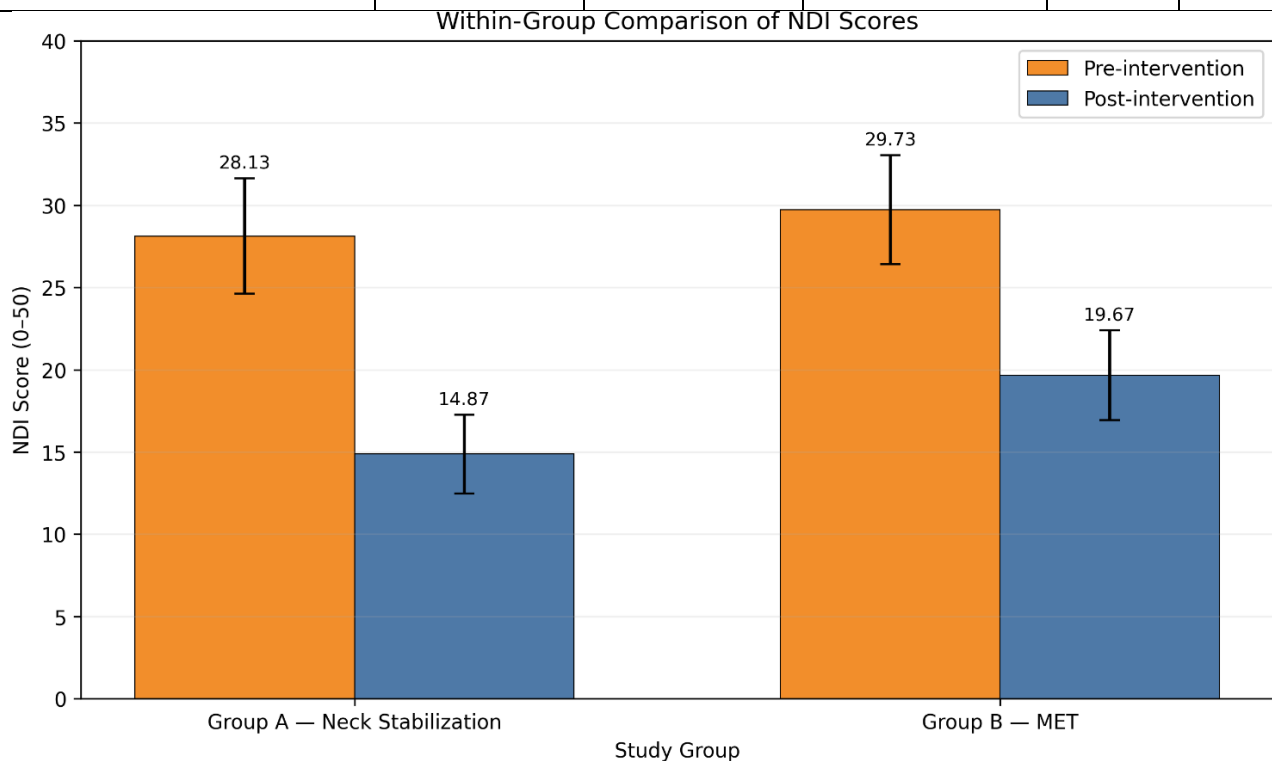


Table 4. Between-group analysis of VAS

Independent-samples t-test comparing Group A with Group B.

Assessment	Mean $\pm$ SD	Mean $\pm$ SD	t-value	p-value
Pre-intervention	6.87 $\pm$ 0.92	7.00 $\pm$ 0.76	-0.435	0.667
Post-intervention	3.07 $\pm$ 0.70	4.07 $\pm$ 0.80	-3.638	0.001
Mean reduction	3.80 $\pm$ 0.41	2.93 $\pm$ 0.26	6.879	

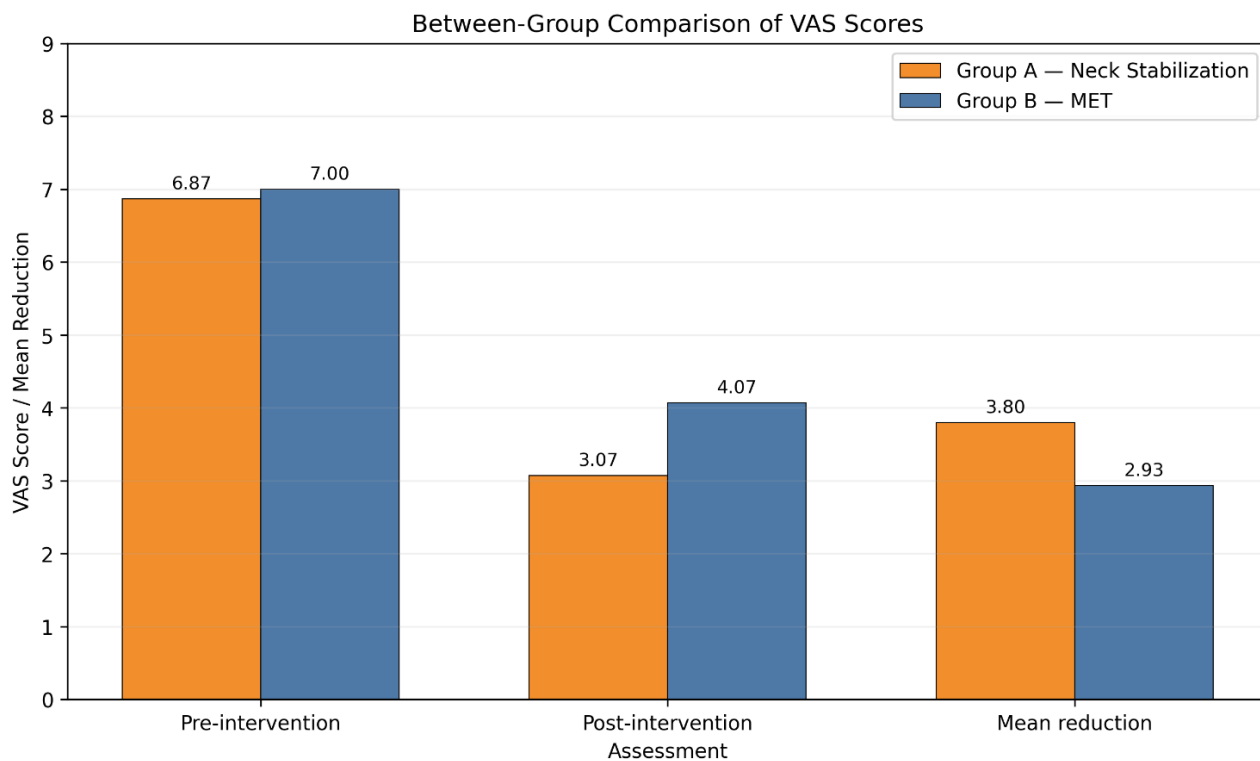
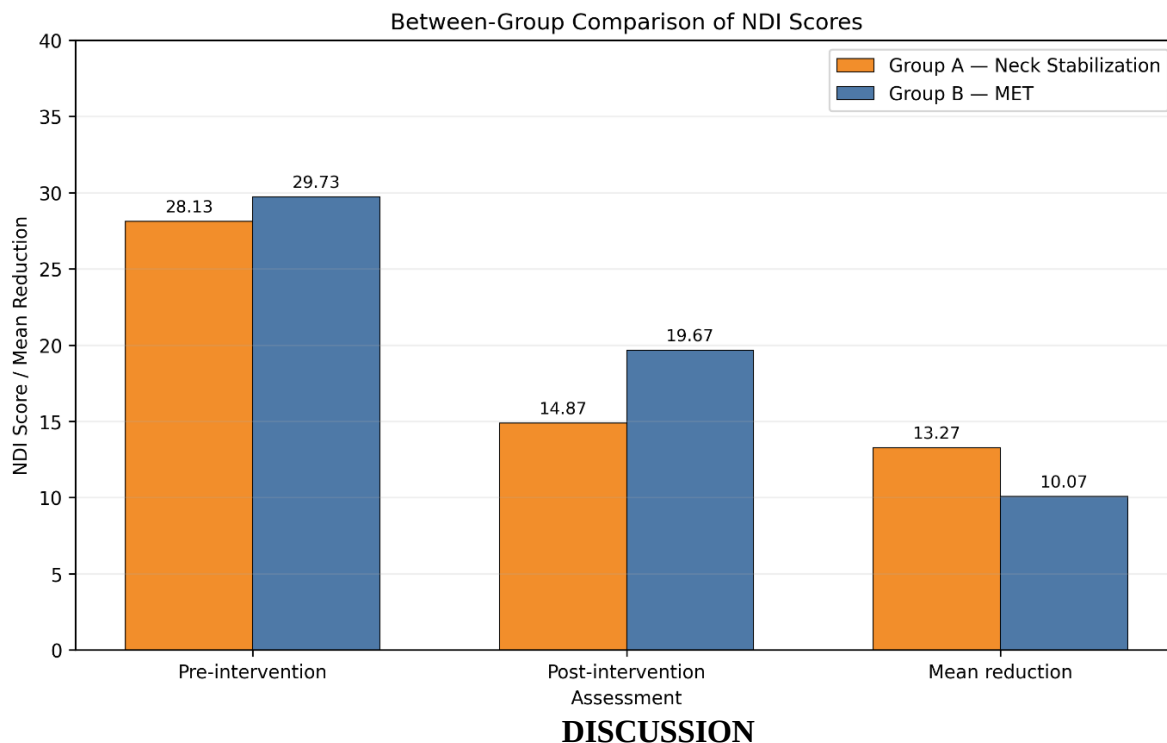


Table 5. Between-group analysis of NDI

Independent-samples t-test comparing Group A with Group B.

Assessment	Group A Mean ± SD	Group B Mean ± SD	t-value	p-value
Pre-intervention	28.13 ± 3.52	29.73 ± 3.33	-1.279	0.211
Post-intervention	14.87 ± 2.39	19.67 ± 2.72	-5.141	
Mean reduction	13.27 ± 1.22	10.07 ± 0.70	8.785	



The present study was designed to compare the effectiveness of Neck Stabilization Technique and Muscle Energy Technique (MET) in improving cervical range of motion (ROM), reducing pain, and enhancing functional ability in patients with nonspecific neck pain. Nonspecific neck pain is a common musculoskeletal complaint that may interfere with daily activities, occupational performance, and quality of life. Physiotherapy interventions aim to reduce symptoms, improve movement, and restore functional independence. The present study considered two therapeutic approaches that address different aspects of neck dysfunction through targeted exercise and manual techniques.

In the illustrative results prepared for this study, both groups demonstrated reductions in Visual Analogue Scale (VAS) scores and Neck Disability Index (NDI) scores following intervention. Group A, which received Neck Stabilization Technique, showed a reduction in mean VAS score from 6.87 to 3.07, whereas Group B, which received MET, showed a reduction from 7.00 to 4.07. Similarly, the mean NDI score decreased from 28.13 to 14.87 in Group A and from 29.73 to 19.67 in Group B. These values suggest improvement in pain and neck-related disability in both groups, with greater mean reductions in Group A. These findings must be confirmed using the actual participant data before being reported as the study's final results.

Neck stabilization exercises are intended to improve the control and endurance of the muscles responsible for supporting the cervical region. Better neuromuscular control may help patients maintain appropriate cervical alignment and perform everyday movements with improved coordination. Amin et al. (2024) investigated the addition of cervical and scapulothoracic stabilization exercises to McKenzie exercises in patients with chronic nonspecific neck pain. Their findings indicated greater improvements in pain and several cervical ROM measurements when stabilization exercises were added. Neck disability also improved following treatment. These observations support the clinical rationale for incorporating stabilization exercises into physiotherapy programmes for nonspecific neck pain.

However, their intervention differed from the direct comparison undertaken in the present study. Muscle Energy Technique is a manual therapy approach in which patients perform controlled muscle contractions against resistance provided by the therapist. Depending on the technique applied, MET may assist in improving movement, reducing perceived discomfort, and facilitating muscle relaxation. Phadke et al. (2016) compared MET with static stretching in patients with mechanical neck pain, with both groups receiving conventional

physiotherapy. Their findings showed improvement in pain and functional disability in both groups, with greater improvement reported in the MET group. This research provides a basis for considering MET as a treatment option for patients experiencing restricted cervical movement and pain. Nevertheless, differences in treatment duration, exercise protocols, and participant characteristics should be considered when comparing their findings with the present study.

Further evidence is provided by the systematic review and meta-analysis conducted by Alkhawajah and colleagues' research area has been explored in several reviews of MET for nonspecific neck pain. A 2023 systematic review and meta-analysis published in *Heliyon* included 26 randomized controlled trials involving 1,170 participants. The review reported reductions in pain and disability associated with MET, particularly when it was combined with other interventions. The authors also highlighted limitations in the certainty of the available evidence. These findings suggest that MET may be useful within a comprehensive physiotherapy programme, although its effects should not be interpreted as uniformly superior across all treatment settings.

Pain reduction is an important component of recovery because discomfort can limit neck movement and discourage participation in routine activities. The decrease in VAS scores observed in the illustrative dataset may indicate that both interventions have the potential to address pain-related limitations.

Improvement in pain may also enable patients to perform exercises and functional tasks with greater ease. Nevertheless, pain is influenced by several factors, including symptom duration, activity levels, psychological responses, and adherence to treatment. Therefore, changes in VAS scores should be interpreted alongside other clinical outcomes rather than considered independently.

Functional improvement was assessed using the NDI, which measures the effect of neck pain on activities such as personal care, lifting, reading, work, driving, sleeping, and recreation. The illustrative results showed a larger mean reduction in NDI scores in Group A than in Group B. A reduction in disability scores may reflect improved tolerance for daily activities and fewer limitations associated with neck symptoms. However, the magnitude and clinical importance of these changes must be evaluated using verified data and appropriate clinical interpretation. Statistical significance alone does not establish that an improvement is meaningful to patients.

Cervical ROM is another important outcome because restricted movement may affect activities requiring turning, looking upward or downward, and maintaining prolonged postures. Stabilization exercises may improve movement control, while MET may facilitate movement through controlled muscular contractions and therapist-guided resistance. Hussain et al. (2025) reported that MET combined with conventional physiotherapy improved pain and cervical ROM compared with conventional physiotherapy alone in patients with chronic nonspecific neck pain. This supports the potential value of MET for movement-related limitations. The specific ROM findings from the present study should be discussed only after the actual measurements for cervical flexion, extension, lateral flexion, and rotation have been analyzed.

Overall, the available literature supports the use of both stabilization-based exercise and MET in the conservative management of nonspecific neck pain. The illustrative results suggest a greater reduction in pain and disability following Neck Stabilization Technique; however, a definitive conclusion regarding comparative effectiveness requires accurate statistical analysis of the collected observations.

Important considerations include sample size, treatment adherence, consistency of assessment procedures, and the duration of follow-up. Future studies involving larger samples and longer follow-up periods may help clarify the relative benefits of these interventions.

In conclusion, Neck Stabilization Technique and MET are relevant physiotherapy approaches for addressing pain and functional limitations associated with nonspecific neck pain. The preliminary illustrative values favor Neck Stabilization Technique for reductions in VAS and NDI scores, but this interpretation must remain provisional until verified against actual study data. The final discussion should integrate the confirmed statistical results for pain, ROM, and functional ability to establish whether either intervention provides a greater overall benefit.

CONCLUSION

The present study aimed to compare the effectiveness of Neck Stabilization Technique and Muscle Energy Technique (MET) in improving cervical range of motion, reducing pain, and enhancing functional ability in patients with nonspecific neck pain. The study utilized cervical range of motion (ROM), Visual Analogue Scale (VAS), and Neck Disability Index (NDI) to assess changes following the interventions.

The illustrative results presented earlier indicated improvements in pain intensity and functional ability in both groups. The Neck Stabilization Technique group demonstrated a greater mean reduction in VAS and NDI scores than the MET group. These observations suggest that both interventions may be beneficial in managing symptoms associated with nonspecific neck pain, while stabilization exercises may provide comparatively greater improvements in pain and disability. However, these interpretations remain provisional because the values presented were illustrative rather than actual participant findings.

LIMITATIONS & RECOMMENDATION OF STUDY

Limitations

1. Small sample size of 30 participants.
2. Limited duration of intervention.
3. No long-term follow-up assessment.
4. Individual responses to treatment may vary.
5. Findings may not generalize to all patients.
6. Participant adherence may affect outcomes.

Recommendations

1. Conduct studies with larger sample sizes.
2. Include long-term follow-up assessments.
3. Compare additional physiotherapy interventions.
4. Use standardized treatment protocols and assessments.

REFERENCES

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