

Comparison of sternocleidomastoid and trapezius muscle stretches in the management of symptomatic non specific cervical pain

Comparación de los estiramientos de los músculoesternocleidomastoideo y trapecio en el tratamiento del dolor cervical sintomático no específico

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Abstract

Introduction: Non-specific cervical pain is a frequent musculoskeletal condition that impairs quality of life and daily activities, and may be caused by Poor posture, muscle strain, stress, prolonged sitting, repetitive movements, or sleeping in an awkward position. The relative efficacy of sternocleidomastoid (SCM) and trapezius muscle stretching is still unknown, despite the fact that muscle stretching is frequently used to relieve pain. Their effects on pain intensity and functional impairment are assessed and contrasted in this study.

Methods: A quasi-experimental study was conducted with 60 participants diagnosed with nonspecific cervical pain. They were randomly assigned to two groups: Group 1 (SCM muscle stretching) and Group 2 (trapezius muscle stretching). Each group performed their respective stretching exercises, repeated 5 times, twice a week, for 4 weeks, with intervals of 0.5-10 seconds rest from one stretch to another. Outcome measures included the Numerical Pain Rating Scale (NPRS) for pain assessment and the Neck Disability Index (NDI) for functional evaluation. Result: Both stretching interventions led to a significant reduction in pain and improved functional ability (p < 0.001). However, the trapezius stretching group showed greater improvements in pain reduction and functional scores compared to the SCM stretching group. Conclusion: Both SCM and trapezius stretches effectively reduce pain and disability in pan sne

Conclusion: Both SCM and trapezius stretches effectively reduce pain and disability in non-specific cervical pain. However, trapezius stretching provides superior benefits, suggesting it may be a more effective intervention.

Keywords

Non-specific cervical pain, sternocleidomastoid stretching, trapezius stretching, pain management, functional disability, musculoskeletal disorders.

Resumen

Introducción: El dolor cervical inespecífico es una afección musculoesquelética frecuente que afecta la calidad de vida y las actividades cotidianas, y puede estar causada por mala postura, distensión muscular, estrés, estar sentado durante períodos prolongados, movimientos repetitivos o dormir en una posición incómoda. La eficacia relativa del estiramiento de los músculos esternocleidomastoideo (ECM) y trapecio aún se desconoce, a pesar de que el estiramiento muscular se utiliza con frecuencia para aliviar el dolor. En este estudio se evalúan y contrastan sus efectos sobre la intensidad del dolor y el deterioro funcional.

Métodos: Se realizó un estudio cuasiexperimental con 60 participantes diagnosticados con dolor cervical inespecífico. Se asignaron aleatoriamente a dos grupos: Grupo 1 (estiramiento del ECM) y Grupo 2 (estiramiento del trapecio). Cada grupo realizó sus respectivos ejercicios de estiramiento, repetidos 5 veces, dos veces por semana, durante 4 semanas, con intervalos de 0,5 a 10 segundos de descanso entre un estiramiento y otro. Las medidas de resultado incluyeron la Escala Numérica de Calificación del Dolor (NPRS) para la evaluación del dolor y el Índice de Discapacidad Cervical (NDI) para la evaluación funcional.

Resultado: Ambas intervenciones de estiramiento condujeron a una reducción significativa del dolor y una mejora de la capacidad funcional (p < 0,001). Sin embargo, el grupo de estiramiento de trapecio mostró mayores mejoras en la reducción del dolor y las puntuaciones funcionales en comparación con el grupo de estiramiento de ECM.

Conclusión: Tanto los estiramientos de ECM como los de trapecio reducen eficazmente el dolor y la discapacidad en el dolor cervical inespecífico. Sin embargo, el estiramiento de trapecio proporciona mayores beneficios, lo que sugiere que podría ser una intervención más eficaz.

Palabras clave

Dolor cervical inespecífico, estiramiento del esternocleidomastoideo, estiramiento del trapecio, manejo del dolor, discapacidad funcional, trastornos musculoesqueléticos





Introduction

Non-specific cervical pain is a prevalent musculoskeletal condition affecting individuals worldwide, with significant implications for daily functioning and quality of life. It is often associated with poor posture, occupational demands, and musculoskeletal imbalances. The global prevalence of neck pain ranges from 14% to 71%, with an annual incidence rate of approximately 11% to 18% (Ezzati et al., 2021; Paksaichol et al., 2012). In Asia, particularly in countries such as India, the burden of neck pain is rising due to the increasing use of electronic devices, sedentary work culture, and lack of ergonomic awareness (Rosa et al., 2024). Among working-age individuals, non-specific cervical pain contributes significantly to disability, absenteeism, and reduced productivity (Dudoniene et al., 2024). Non-specific cervical pain presents with a range of symptoms, including persistent dull or sharp pain, muscle stiffness, restricted range of motion, and referred pain to the shoulders and upper extremities. Neurological symptoms, such as tingling, numbness, or weakness, may also be present in cases with nerve involvement (Jeong et al., 2024).

One of the major contributing factors to non-specific cervical pain is muscular imbalance, particularly in the sternocleidomastoid (SCM) and trapezius muscles. Prolonged poor posture, such as forward head posture, leads to adaptive shortening and increased tension in these muscles, resulting in pain and functional limitations (Sarig Bahat et al., 2023). The underlying pathophysiology involves mechanical stress, ischemia, and myofascial trigger points, which contribute to altered neuromuscular control and decreased cervical stability (Ibrahim Elnaggar et al., 2022). Stretching interventions targeting the trapezius and sternocleidomastoid muscles have been widely explored as effective non-pharmacological strategies for alleviating non-specific cervical pain. Trapezius stretching helps to reduce muscle tension, improve flexibility, and decrease pain intensity by alleviating myofascial restrictions and enhancing blood circulation (Kang & Kim, 2022). Similarly, SCM stretching has been shown to relieve cervical muscle tightness, enhance cervical range of motion, and contribute to improved postural alignment (Büyükturan et al., 2021).

Combined with massage techniques, stretching interventions lead to greater pain relief, reduced kinesiophobia, and improved functional outcomes (Daher & Dar, 2024). Research supports that incorporating these stretches into rehabilitation protocols enhances neuromuscular efficiency and postural control, particularly when combined with therapeutic exercises (Chen et al., 2023). Studies indicate that individuals receiving stretching-based interventions experience significant reductions in pain and disability, with improvements noted in endurance and range of motion (El-Khateeb et al., 2022). Furthermore, therapeutic stretching techniques, when performed consistently, contribute to long-term benefits in terms of reduced recurrence of non-specific cervical pain and enhanced musculoskeletal resilience (Osama & Shakil Ur Rehman, 2020).

Evaluating the effectiveness of interventions for non-specific cervical pain requires the use of standardized outcome measures. The Numeric Pain Rating Scale (NPRS) is a widely used tool for assessing pain intensity, providing a reliable and straightforward method for quantifying pain on a scale of 0 to 10 (Moses et al., 2019). Additionally, the Neck Disability Index (NDI) serves as a crucial measure of functional impairment, assessing the impact of neck pain on daily activities such as personal care, work, and recreation (Young et al., 2019). Both NPRS and NDI have been validated in various populations and are commonly used in clinical and research settings to track treatment outcomes and guide rehabilitation strategies (Karcioglu et al., 2018).

The primary aim of this study is to compare the effectiveness of stretching interventions, specifically trapezius and sternocleidomastoid (SCM) muscle stretches, in improving pain relief and functional ability in individuals with non-specific cervical pain (Maissan et al., 2020). This study seeks to determine the impact of these stretching techniques on pain intensity, disability, range of motion, and overall quality of life in affected individuals. Non-specific cervical pain is a prevalent musculoskeletal condition affecting a large proportion of the global population, with significant implications for work productivity and daily activities. Despite numerous interventions available for managing cervical pain, stretching exercises targeting the trapezius and SCM muscles have shown promising results in reducing muscle tension and improving mobility. However, there remains a gap in research regarding the comparative effectiveness of these specific stretching techniques. This study is essential to provide evidence-based





recommendations for physiotherapeutic management of non-specific cervical pain, thereby improving clinical decision-making and patient outcomes.

Method

This study follows a quasi-experimental design to assess the effectiveness of sternocleidomastoid (SCM) and trapezius muscle stretching in individuals with non-specific cervical pain. For this study, the sample size was determined through OpenEpi. A total of 60 participants, aged between 18 and 60 years, will be recruited based on specific inclusion and exclusion criteria. Participants must have experienced non-specific cervical pain for at least four weeks, have no history of cervical spine pathology such as disc herniation or fractures, and be physically able to engage in exercise. Individuals with a history of severe trauma, auto accidents, neck surgery, cervical spinal cord compromise, cancer, infections, inflammatory diseases, or fractures will be excluded from the study.

To ensure unbiased allocation, participants will be randomly assigned to two intervention groups using Random.org. Group 1 (n=30) will receive sternocleidomastoid muscle stretching, while Group 2 (n=30) will undergo trapezius muscle stretching. The intervention will be administered under supervised conditions to maintain consistency and accuracy in execution.

Study procedure

All participants provided written informed consent prior to their inclusion in the study, in accordance with the ethical standards of the institutional research committee and the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Eligible participants will receive a detailed explanation of the study, and written informed consent will be obtained. Baseline assessments, including Numerical Pain Rating Scale (NPRS) for pain intensity and the Neck Disability Index (NDI) for functional disability, will be conducted before the intervention.

Participants will then be randomly allocated into two groups using a computer-generated randomization list:

Group 1 (n=30) - Sternocleidomastoid (SCM) muscle stretching

Group 2 (n=30) – Trapezius muscle stretching

Each participant will undergo supervised stretching interventions over 4 weeks, with sessions conducted twice a week. Each exercise will be repeated 5 times per session, with rest intervals of 0.5-10 seconds between stretches.

Intervention

Sternocleidomastoid (SCM) Stretching (Group 1)

The participant will be seated in a neutral position.

To stretch the right SCM, the participant will tilt their head to the left side, rotate their head upward to the right, and extend the neck slightly.

The stretch will be held for 20–30 seconds and repeated 5 times per session.

The same procedure will be followed for the left SCM, which will be tilted to the right and rotated upward to the left.

Trapezius Muscle Stretching (Group 2)

The participant will be seated in a neutral position with the spine upright.

To stretch the right upper trapezius, the participant will tilt their head toward the left shoulder while keeping the right shoulder down.

The stretch will be gently assisted by placing the left hand on the head to deepen the stretch.

The stretch will be held for 20–30 seconds and repeated 5 times per session.

The same procedure will be followed for the left trapezius by tilting toward the right shoulder.





Session Protocol

Frequency: Twice a week for 4 weeks

Repetitions: 5 times per session

Rest Intervals: 0.5–10 seconds between stretches

Stretch Duration: 20–30 seconds per repetition

Aforementioned procedures were performed by the principal investigator under the supervisión of the guide.

Outcome measure

The Numerical Pain Rating Scale (NPRS) is a subjective tool for assessing pain intensity on a 0-10 scale, where 0 indicates no pain and 10 represents the worst possible pain. It is widely used due to its simplicity, reliability, and sensitivity to change.

The Neck Disability Index (NDI) is a self-reported questionnaire that evaluates the impact of cervical pain on daily activities through 10 domains, including pain intensity, personal care, work, and recreation. Scores range from 0 (no disability) to 50 (maximum disability), with higher scores indicating greater impairment. Both NPRS and NDI will be recorded at baseline and post-intervention to assess changes in pain and functional disability following SCM and trapezius muscle stretching.

Results

SPSS version 27 was utilized for the statistical analysis. A total of 60 participants were randomly assigned to two groups: SCM stretching (n=30) and trapezius stretching (n=30).

Table 1. Pre-test and post-test s	cores for the SCM Stret	ching Group (n=30)		
Measure	Pre-Test Mean (SD)	Post-Test Mean (SD)	t	р
Numerical Pain Rating Scale (NPRS)	6.43 (1.17)	3.97 (1.33)	15.00	<.001
Neck Disability Index (NDI)	18.57 (2.16)	13.20 (1.86)	14.51	<.001

Note. SCM = Sternocleidomastoid; SD = Standard Deviation.

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Measure	Pre-Test Mean (SD)	Post-Test Mean (SD)	t	р
Numerical Pain Rating Scale (NPRS)	6.17 (1.32)	2.70 (0.99)	16.28	<.001
Neck Disability Index (NDI)	18.60 (2.42)	6.17 (1.37)	28.01	<.001

Table 3. Post-test comparison between SCM and Trapezius Stretching Groups				
Measure	SCM Group Mean (SD)	Trapezius Group Mean (SD)	t	р
Numerical Pain Rating Scale (NPRS)	3.97 (1.33)	2.70 (0.99)	4.20	<.001
Neck Disability Index (NDI)	13.20 (1.86)	6.17 (1.37)	16.67	<.001

A comparison of post-values between the SCM stretching group and the Trapezius stretching group reveals significant differences in NPRS and NDI. The Trapezius stretching group recorded a lower mean score of 2.70 ± 0.99 for NPRS and also 6.17 ± 1.37 for NDI, with a p value of <0.001, which indicates the Trapezius group shows decreased pain and decreased functional neck disability compared to the SCM group.





Discussion

The findings of this study indicate that trapezius muscle stretching was more effective than sternocleidomastoid (SCM) stretching in reducing pain intensity and improving functional ability in individuals with non-specific cervical pain. Both interventions resulted in significant improvements in Numerical Pain Rating Scale (NPRS) and Neck Disability Index (NDI) scores. However, participants in the trapezius stretching group showed greater reductions in pain and disability, suggesting its superior therapeutic benefits (Tatsios et al., 2022). The trapezius muscle plays a crucial role in postural stabilization and scapular control, making it a key contributor to cervical spine biomechanics. Chronic tension in this muscle, often due to prolonged sitting, poor ergonomics, and repetitive upper limb activities, leads to increased strain on the cervical spine, contributing to pain and dysfunction (Jeong et al., 2024). Several studies have reported that upper trapezius tightness is strongly associated with cervical pain and postural misalignments, reinforcing the need for targeted interventions to address these issues (El-Khateeb et al., 2022; Mendes-Fernandes et al., 2021). The greater effectiveness of trapezius stretching can be attributed to its ability to reduce myofascial restrictions, enhance scapular mobility, and relieve muscle tension, leading to improved cervical function and better postural control. Research has shown that trapezius muscle dysfunction contributes to compensatory patterns in adjacent muscles, including the SCM, leading to increased muscle stiffness and pain (Ibrahim Elnaggar et al., 2022). By stretching the trapezius, tension is alleviated in the surrounding musculature, resulting in greater overall improvements in pain relief and functional recovery (Dueñas et al., 2021).

While SCM stretching also provided significant benefits, its impact on overall cervical mobility and pain reduction was comparatively lower. The SCM muscle is primarily involved in cervical flexion and rotation, but its involvement in chronic neck pain syndromes is often secondary to postural imbalances and muscular compensations (Chauhan, 2019). Although stretching the SCM improves muscle relaxation and flexibility, it may not have the same direct impact on scapular stability and upper back function as trapezius stretching. Previous research suggests that SCM dysfunction is commonly associated with forward head posture and increased cervical loading, but trapezius muscle tightness remains a more dominant factor in musculoskeletal neck pain (Kim & Kim, 2019). This supports the notion that trapezius stretching should be prioritized in rehabilitation programs targeting non-specific cervical pain, as it addresses both cervical and scapular dysfunctions simultaneously. Studies have demonstrated that trapezius stretching, when combined with postural correction exercises, results in superior pain relief and improved neuromuscular control compared to SCM stretching alone (Shaheen et al., 2018). Additionally, individuals with upper trapezius tightness often experience radiating pain to the head and shoulders, which can further exacerbate musculoskeletal dysfunction if left unaddressed (Moses et al., 2019). By reducing muscle stiffness and enhancing mobility, trapezius stretching contributes to a more comprehensive approach to cervical pain management.

The clinical implications of these findings highlight the importance of trapezius stretching as a primary intervention in physiotherapy programs for non-specific cervical pain. Given its ease of implementation, accessibility, and effectiveness, it can be incorporated into both clinical rehabilitation protocols and home exercise programs (Sun et al., 2024). The results suggest that addressing upper trapezius tightness should be a key focus in cervical pain management strategies, particularly in individuals with chronic postural strain and occupational-related neck pain (Young et al., 2019). Previous studies have shown that therapeutic stretching of the trapezius, when combined with strengthening exercises, provides long-term relief and prevents pain recurrence (Uthaikhup et al., 2011). Furthermore, integrating trapezius-focused interventions into routine clinical practice can enhance functional recovery, postural alignment, and overall quality of life for individuals suffering from chronic neck pain conditions (Moses et al., 2019).

Despite its strengths, this study has some limitations. The short follow-up period limits the ability to assess long-term outcomes, and future research should incorporate extended monitoring to evaluate the sustainability of improvements. Additionally, while both groups followed a structured stretching protocol, individual factors such as baseline muscle tightness, work-related postural habits, and adherence to home exercise programs may have influenced the results. Future studies should explore the





synergistic effects of trapezius stretching with other therapeutic modalities, such as strengthening exercises, manual therapy, and postural re-education, to determine the most effective multimodal approach for long-term cervical pain management.

Conclusions

This study demonstrates that trapezius stretching is more effective than SCM stretching in reducing pain intensity and disability in individuals with non-specific cervical pain. The significant improvements in NPRS and NDI scores reinforce the importance of trapezius muscle flexibility in cervical rehabilitation. These findings support the integration of trapezius-focused stretching protocols into routine physio-therapy interventions for enhanced pain relief, postural stability, and functional recovery. Future research should explore the combined effects of trapezius stretching with strengthening exercises for long-term cervical pain management.

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Author contributions

Conceptualization, J.R, S.M and S.S.; Methodology J.R and S.S.; Validation, S.A and N.B.; Writing – Original Draft Preparation, J.R., S.M., and S.S., Writing—Review & Editing, K.R., F.A., and S.A.; Supervision, S.S., and Project Administration, S.V

Conflicts of Interest

All authors clearly stated that they do not have any conflict of interest.

Data availability

Usually, the data sets are created during and/or analyzed throughout the entire study and are available from the corresponding author upon reasonable request.

Ethics approval

Obtained from the Saveetha College of Physiotherapy 465/07/2024/ISRB/UGSR/SCPT





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