

MCKENZIE APPROACH AS A TREATMENT FOR CHRONIC PAIN IN INDIVIDUALS WITH CERVICAL SYNDROME – A CASE STUDY

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Abstract: The aim of this case study is to examine the effectiveness of the McKenzie approach in treating a female patient diagnosed with chronic neck pain due to cervical syndrome. The subject is a 40-year-old woman with a sedentary lifestyle and a body mass index of 28.3, diagnosed with a dysfunction-type cervical syndrome. The intervention comprised a total of 30 sessions, including 10 sessions of active McKenzie exercises, 10 sessions of manual mobilization based on the McKenzie concept, and 10 sessions focused on home exercises and education aimed at promoting functional daily habits and a healthier lifestyle.

The effectiveness of the intervention was evaluated at three time points: pre-treatment, mid-treatment, and post-treatment. The assessment tools used included Manual Muscle Testing (MMT) for muscle strength evaluation, Range of Motion (ROM) measurements for cervical spine mobility, and the Visual Analog Scale (VAS) for assessing pain during movement. Additionally, the Spurling test was administered to assess for possible radicular irritation. Questionnaires were also employed to assess functional disability and quality of life: the Neck Disability Index (NDI), the SF-36 Health Survey, and a sedentary behavior questionnaire, administered both at the beginning and end of the intervention.

The results demonstrated a marked reduction in pain, improvement in muscle strength, increased range of motion, and enhancement of both physical and psychological functioning, as well as healthier lifestyle behaviors. This case study supports the potential benefits of the McKenzie approach in managing chronic cervical syndrome.

Keywords: McKenzie approach, cervical syndrome, chronic neck pain, NDI, SF-36, VAS, physiotherapy, case study.

1. INTRODUCTION

Cervical syndrome refers to a set of symptoms associated with degenerative, inflammatory, or mechanical changes in the cervical (neck) region of the spine. Pain is the predominant symptom, often accompanied by restricted mobility, stiffness, and decreased functionality (Petkovska & Zivkovic, 2025).

It is estimated that 30–50% of adults experience neck pain each year, and in 50–85% of these individuals, the pain becomes chronic (Carroll et al., 2008; Côté et al., 2008; Aydogmus et al., 2022). Chronic pain is defined as pain lasting longer than six months—beyond the typical course of acute illness—and is often associated with persistent pathological processes (Manchikanti et al., 2009).

Multiple factors contribute to the development of chronic pain, including biological (e.g., aging), psychological (e.g., anxiety, depression), and occupational elements such as poor posture, prolonged sitting, and excessive computer use (Calderon et al., 2020; Linton, 2000; Cagnie et al., 2007).

Although a variety of pharmacological and non-pharmacological treatment options exist—including massage, acupuncture, yoga, and hydrotherapy—the choice of an effective approach depends largely on the type and underlying cause of the pain (Kazeminasab et al., 2022; Chou et al., 2007). One of the most widely used and well-researched biomechanical approaches is the McKenzie method, which emphasizes self-management, active participation, and postural correction (Pillastrini et al., 2016; Kuppusamy et al., 2013).

Research has demonstrated that the McKenzie method is effective in reducing pain and improving functionality in patients with cervical syndrome (Rutuja, Sandeep & Sayalee, 2023). The exercises employed have both diagnostic and therapeutic value, centered on identifying the mechanical classification of the condition and applying targeted movements to centralize the symptoms (Long et al., 2004; Sahrman et al., 2017).

According to the McKenzie classification, three primary syndromes exist: postural syndrome, dysfunction syndrome, and derangement syndrome. Each requires a tailored therapeutic approach, ranging from postural correction to decompression and extension exercises (Kumar, Praveen, & Kumar, 2021; Owen et al., 2020).

The McKenzie approach is a highly individualized treatment model, based on a detailed assessment of the patient's response to repeated movements and postural changes. It not only alleviates pain but also empowers the patient to

take an active role in the rehabilitation process—an essential element in the long-term management of chronic conditions.

2. METHODOLOGY

This research was designed as a single-subject case study with pre- and post-intervention assessments involving a 40-year-old female patient diagnosed with chronic cervical dysfunction syndrome and exhibiting a sedentary lifestyle. The diagnosis was established at the Department of Physical Medicine and Rehabilitation at the Clinical Hospital “Dr. Trifun Panovski” – Bitola. The patient voluntarily participated and signed an informed consent form prior to the start of treatment.

With a Body Mass Index (BMI) of 28.3 (overweight), the patient was selected due to reporting the highest pain intensity at rest (VAS = 8), making her a representative case for evaluating the effect of the McKenzie approach. The decision to measure pain during movement stemmed from previous observations indicating that most patients did not report pain exceeding VAS 5 at rest, allowing for broader applicability of the findings in future studies. The intervention consisted of a total of 30 treatment sessions, structured in three distinct phases:

Phase I: 10 sessions of active McKenzie exercises (self-directed under supervision).

Chin Tucks in a seated position – hold for 10 seconds, 10 repetitions

Retraction with Extension – seated position, 10 repetitions

Lateral Flexion – seated, 10 repetitions per side

Neck Rotation – seated, 10 repetitions per side

Neck Flexion with Assisted Stretch – 10 repetitions

Breathing Exercise with Shoulder Elevation – inhale with shoulder raise, exhale with shoulder release, 10 repetitions

Phase II: 10 sessions of manual mobilization following the McKenzie method, performed by a certified kinesiotherapist (the researcher).

In a supine position with the head extending beyond the edge of the treatment table, the therapist performed manual retraction of the neck, followed by retraction with extension, lateral flexion, and rotation towards the affected side—executed slowly and carefully. Subsequently, the patient was instructed to reproduce the same movements using their own hands for self-assistance.

Phase III: 10 sessions focused on education, instruction in home exercise routines, and personalized lifestyle modification recommendations tailored to the patient’s habits and physical capacity.

Outcome Measures

Clinical assessments included:

- **Manual Muscle Testing (MMT):** to evaluate cervical muscle strength
- **Range of Motion (ROM):** measurement of cervical spine mobility in flexion, extension, lateral flexion, and rotation
- **Visual Analog Scale (VAS):** subjective measure of pain intensity during movement
- **Spurling Test:** to assess potential radicular pain (nerve root irritation)
- **Body Mass Index (BMI):** to assess weight in relation to height

Standardized questionnaires included:

- **Neck Disability Index (NDI):** to assess functional limitations before and after intervention
- **SF-36 Health Survey:** to evaluate general health and quality of life
- **Sedentary Behavior Questionnaire:** to track changes in physical activity and lifestyle habits

Timeline and Measurement Points

The intervention spanned six weeks, with five sessions conducted weekly. Assessments were carried out at three time points:

- **Baseline Assessment:** prior to treatment initiation
- **Midpoint Assessment:** after 15 sessions (mid-intervention)
- **Final Assessment:** following the 30th session

Questionnaires were administered twice—at the beginning and at the end of the intervention—to measure changes in function, health status, and behavior.

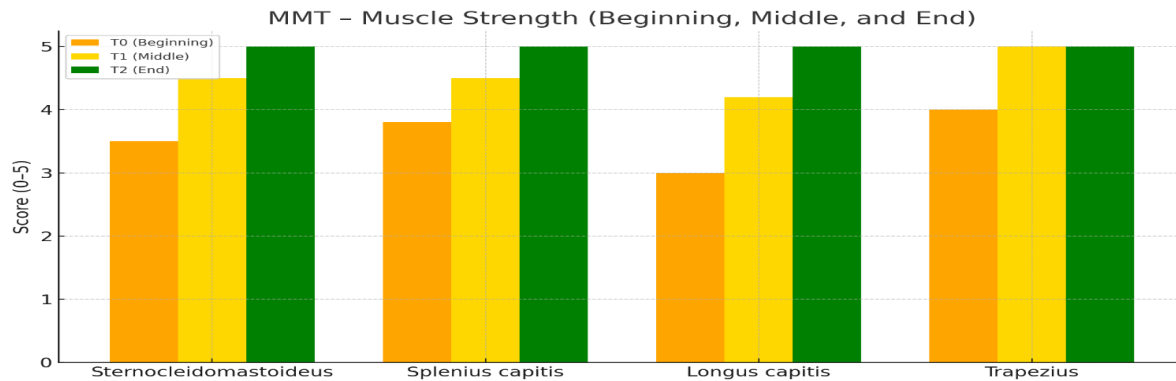
3. RESULTS

This section presents the findings from the clinical assessments and standardized questionnaires conducted at three time points: baseline (T0), mid-intervention (T1), and post-intervention (T2) of the McKenzie treatment. The

analysis encompasses the following parameters: pain intensity, muscle strength, range of motion, functional disability, quality of life, Body Mass Index (BMI), and sedentary behavior. The data were analyzed descriptively and are illustrated graphically to facilitate a clearer understanding of the observed changes. Emphasis is placed on the differences between the initial and final values, with a detailed discussion of each parameter and its clinical implications.

Results from Clinical Measurements

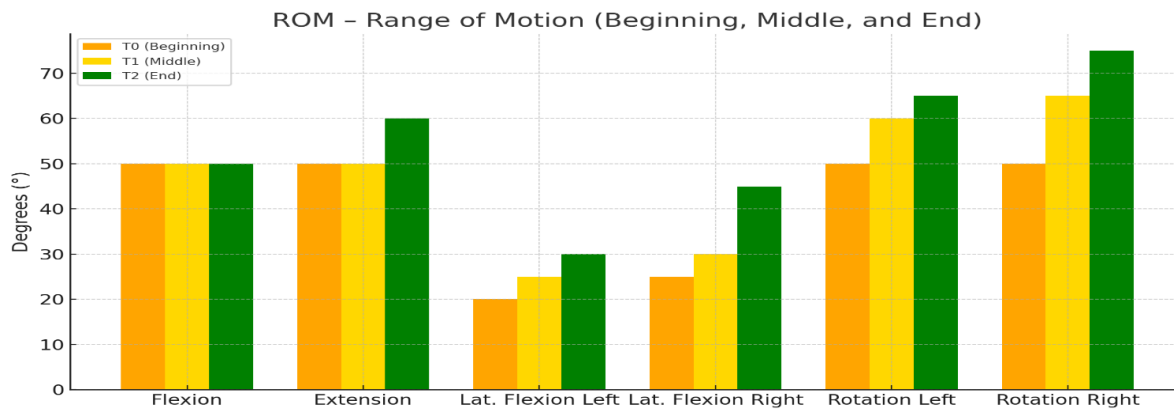
Figure 1. Manual Muscle Testing (MMT).



Source: Authors' research

Discussion: The muscle strength chart demonstrates a clear progression from initial values between 3 and 4 to maximum values (5) upon completion of the treatment. This indicates a re-establishment of stability and support in the cervical region, as well as the effectiveness of the McKenzie method in strengthening the local musculature—particularly through the phase involving active exercises.

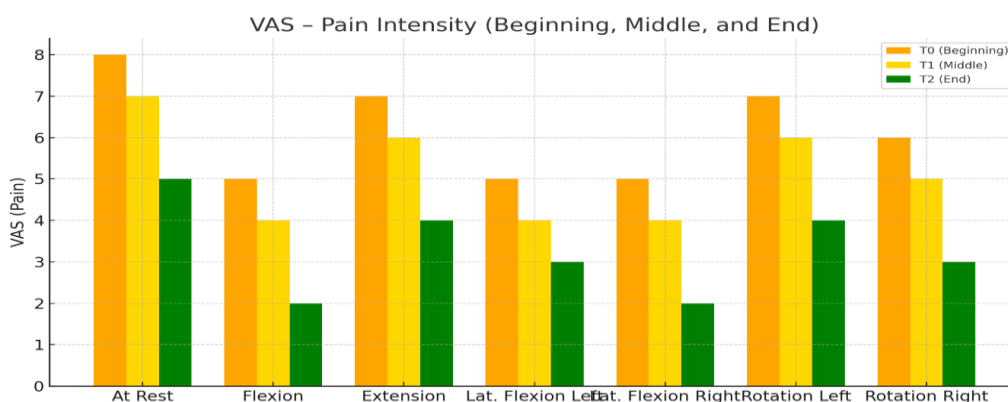
Figure 2. Range of Motion (ROM).



Source: Authors' research

Discussion: The ROM chart demonstrates increased mobility across all axes of the cervical spine. Flexibility improved most significantly in rotation and lateral flexion, particularly on the right side (from 30° to 45°). These improvements indicate a reduction in muscular stiffness and an enhancement of the biomechanical function of the joints and soft tissues. The intervention led to the restoration of physiological movement values, thereby improving daily functional capacity.

Figure 3. Visual Analog Scale (VAS).

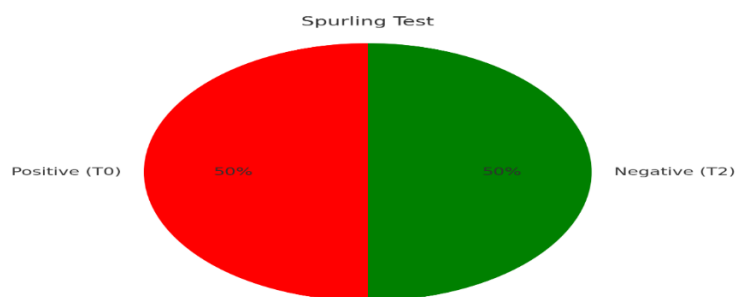


Source: Authors' research

Discussion:

The VAS (Visual Analog Scale) chart illustrates a progressive reduction in pain across the three time points. At rest, pain decreased from 8 (T0) to 7 (T1) and further to 4 (T2), while all active movements showed a reduction of at least 2–3 points. The most significant improvement was observed during neck rotation and flexion to the right, whereas the left side showed less progress. This suggests successful mechanical decompression and postural stabilization achieved through the McKenzie approach, though maximal outcomes were not fully reached. These findings align with the principle of pain centralization, which is a key therapeutic effect of the McKenzie method.

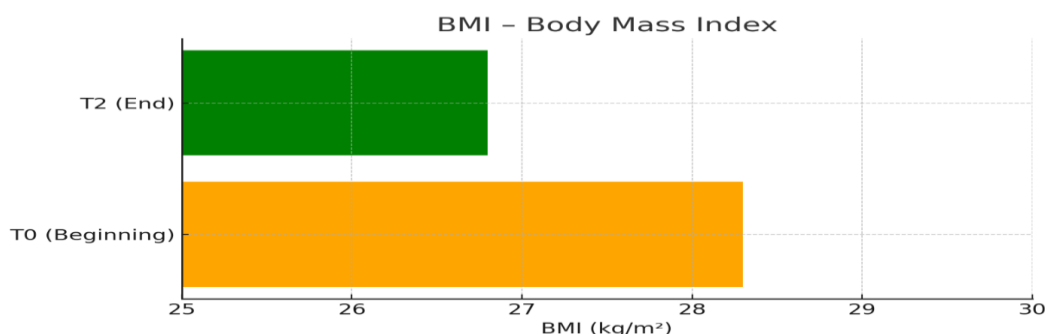
Figure 4. Spurling Test – Assessment of Potential Radicular Pain (Nerve Root Irritation).



Source: Authors' research

The test, which was positive at the beginning, turned negative by the end of the intervention. This outcome can be attributed to the professional and targeted application of the McKenzie approach.

Figure 5. BMI – Body Mass Index



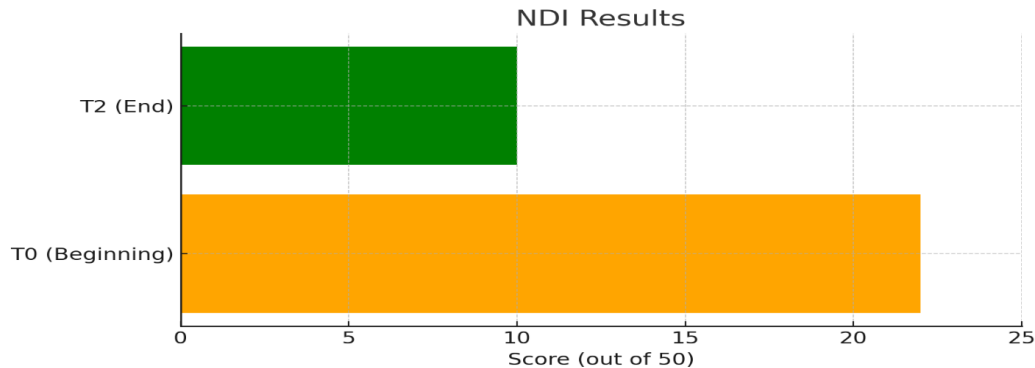
Source: Authors' research

Discussion:

The chart shows a slight decrease in Body Mass Index (BMI) from 28.3 at baseline (T0) to 26.8 at the end of the intervention (T2). Although modest, this reduction suggests the beginning of positive lifestyle changes, likely influenced by the education and physical activity components of the McKenzie-based rehabilitation. Maintaining and further reducing BMI could enhance long-term outcomes and reduce the mechanical load on the cervical spine.

Results from Standardized Questionnaires

Figure 6. Neck Disability Index (NDI).

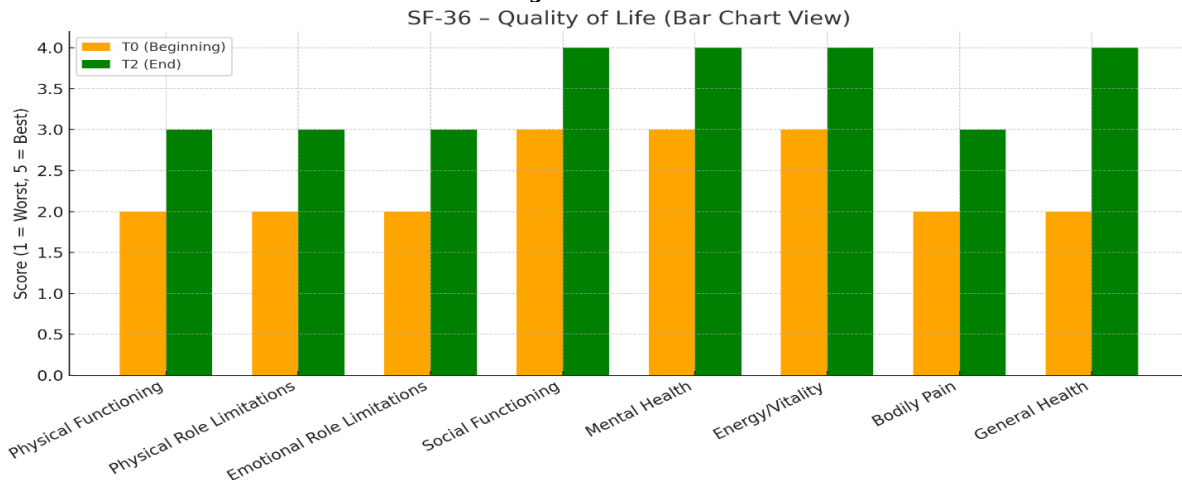


Source: Authors' research

Discussion:

The horizontal chart for NDI shows a reduction in functional limitation from 22 to 10 points, representing a 54.5% decrease. This result indicates a significant improvement in the patient's daily functioning. The combination of active exercises, manual mobilization, and lifestyle education played a key role in enhancing work capacity, sleep quality, and participation in recreational activities.

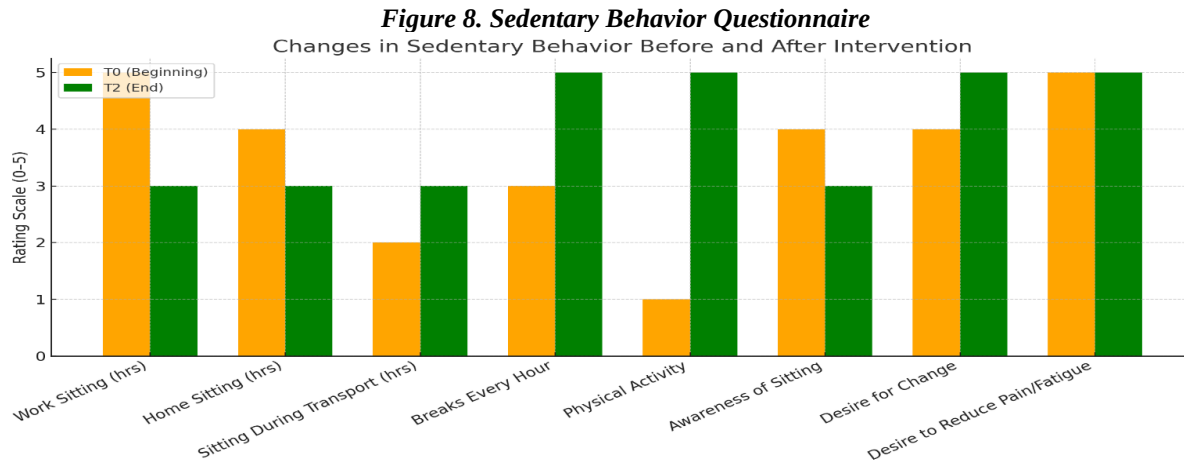
Figure 7. SF-36.



Source: Authors' research

Discussion:

The SF-36 data indicate improvements across all eight domains, reflecting a shift from moderate or unsatisfactory conditions to good levels of functioning. Particularly notable are the gains in mental health, energy/vitality, and general health. The patient demonstrated a more active role in her own rehabilitation, and the self-management component—central to the McKenzie approach—had a positive impact on her overall psychophysical status.



Source: Authors' research

Discussion:

The results from the Sedentary Behavior Questionnaire indicate a significant shift in the patient's daily lifestyle following the McKenzie intervention. At the initial assessment, the patient reported sitting for 8 or more hours daily at work, an additional 1–3 hours at home, and taking rare or no breaks during prolonged sitting. The most notable improvements were observed in the adoption of regular breaks, reduction in home sitting time, and an increase in daily physical activity.

Furthermore, the patient reported engaging in daily physical activity aimed at reducing the negative effects of prolonged sitting, along with increased awareness and motivation to change harmful habits.

These findings highlight that the third phase of the McKenzie approach—focused on education and lifestyle adaptation—has a meaningful impact on patient behavior beyond the therapeutic setting. The functional orientation of the method and the active involvement of the patient contribute not only to pain reduction and increased mobility but also to the long-term modification of harmful habits, which is a crucial step toward sustainable rehabilitation.

4. DISCUSSION

The results obtained from this case study indicate a significant therapeutic effect of the McKenzie approach in a patient with chronic cervical syndrome. The reduction in pain (VAS), improvement in mobility (ROM), muscle strength (MMT), and functional status (NDI and SF-36) confirm the clinical effectiveness of the intervention.

Clinical significance of the results:

Pain intensity at rest decreased from 8 to 4, and during active movements, a reduction of more than 50% was observed.

The range of motion—particularly in rotation and lateral flexion—reached reference values, indicating a restoration of normal biomechanics. Muscle strength was restored to normal levels (5/5) in all cervical segment muscles, which is critical for stabilization and postural correction. The Spurling test, which was initially positive, became negative, suggesting a reduction in radicular symptoms.

These findings are consistent with the research of Long et al. (2004), Kuppusamy et al. (2013), and Rutuja et al. (2023), which demonstrate that the McKenzie approach leads to symptom centralization, improved functionality, and enhanced pain control. As noted by Pillastrini et al. (2016), the inclusion of education and self-management plays a key role in the long-term stabilization of the condition—confirmed in our patient as well.

Additionally, the Sedentary Behavior Questionnaire points to positive lifestyle changes, including the introduction of regular physical activity and work breaks, supporting the psychophysical improvements measured by SF-36 and NDI.

The NDI score was reduced by 54.5%, representing a clinically significant improvement, while the SF-36 showed progress in both physical and mental functioning domains.

Potential limitations:

This study is limited by its small sample size (a single patient), which restricts the generalizability of the findings. However, it offers valuable clinical insight into the application of the McKenzie approach in real-world practice. Future research should include larger samples, the use of control groups, and long-term follow-up.

5. CONCLUSION

The McKenzie approach, applied in three phases—active exercises, manual mobilization, and education—demonstrated significant effectiveness in treating chronic pain in a patient with cervical syndrome. The results indicate a reduction in pain, increased mobility, normalization of muscle strength, and improvement in quality of life.

This study confirms the value of the McKenzie method as an individualized, active, and educational approach that can have a substantial impact on rehabilitation and functional autonomy in patients with chronic neck pain.

Furthermore, the findings suggest that the integrated approach of McKenzie therapy can foster a proactive attitude in patients, which not only alleviates symptoms but also enhances their self-confidence and motivation for maintaining improved physical and functional abilities in the long term.

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