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Review Article

Conservative Physiotherapy and Nordic Health Devices in Cervical Curve Regulation for Neck Pain Relief: A Commentary

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Abstract: Neck pain is a prevalent mechanical musculoskeletal condition often linked to alterations in cervical lordosis, commonly resulting from poor posture, muscle imbalances, or degenerative changes. This commentary examines the role of conservative management strategies, including physical therapy, postural correction, and manual therapy, in restoring and maintaining the natural curvature of the cervical spine to alleviate pain. Additionally, it highlights the role of advanced spinal assessment tools, particularly Nordic health devices, which provide precise, quantifiable data on cervical spine alignment, range of motion (ROM), and muscle imbalances. Key outcome measures, such as the Numeric Pain Rating Scale (NPRS), Cobb's angle, and the Neck Pain and Disability Index (NPAD), facilitate the evaluation of pain severity, spinal alignment, and functional impairment in individuals with neck pain. By leveraging these technologies, objective data can be gathered to identify abnormal spinal curvature and muscle imbalances, enabling the development of personalized rehabilitation programs. The integration of conservative therapy with device-assisted spinal screening offers a comprehensive, evidence-based approach to managing cervical lordosis and mitigating neck pain, with continuous monitoring ensuring sustained treatment effectiveness.

Keywords: Cervical Lordosis, Neck Pain, Conservative Management, Spinal Screening, Physical Therapy, Postural Correction, Manual Therapy, Nordic Health Devices, Range of Motion, Muscle Imbalance, Numeric Pain Rating Scale (NPRS), Cobb's Angle, Neck Pain and Disability Index (NPAD).

INTRODUCTION

Neck pain is a highly prevalent mechanical musculoskeletal disorder, affecting nearly two-thirds of the population at some point in their lives. It often stems from poor posture, muscular imbalance, and degenerative changes, particularly affecting the cervical spine's alignment and function. Alterations in cervical alignment, particularly deviations in Cobb's angle, are frequently observed in individuals with chronic neck pain. Cobb's angle, traditionally used to assess spinal curvature, reflects the degree of cervical lordosis or kyphosis. A reduced or reversed cervical lordotic curve is associated with increased mechanical stress on the intervertebral discs, ligaments, and musculature, often leading to persistent pain, restricted mobility, and postural fatigue [1-11]. Over time, such deviations may contribute to compensatory changes in the thoracic and lumbar regions, exacerbating the overall biomechanical burden.

Although Cobb's angle is primarily evaluated radiographically, its clinical implications underscore the importance of restoring functional alignment through targeted interventions.

While conservative physiotherapy remains the cornerstone of management, traditional clinical assessments—such as visual posture analysis, manual muscle testing, and goniometry—are limited by subjectivity and inconsistent reproducibility. These shortcomings make it difficult to quantify functional impairments and monitor therapeutic progress effectively.

To bridge this gap, technological innovations like Nordic health devices have emerged as valuable

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tools in physiotherapy practice. Studies show that integrating device-based cervical assessment enhances rehabilitation outcomes and improves accuracy in identifying ROM deficits and muscle imbalances. While Nordic health devices do not directly assess structural spinal parameters like Cobb's angle, which requires radiographic imaging, they do provide dependable, objective data on functional aspects of the cervical spine, such as range of motion (ROM), isometric muscle strength, and movement symmetry [4–16]. These measures aid in identifying neuromuscular impairments, postural abnormalities, and movement constraints that may contribute to aberrant spinal alignment. When utilized in conjunction with clinical examination and imaging data, these tools improve diagnostic accuracy and allow for more personalized rehabilitation plans ultimately contributing to pain reduction and improved functional outcomes. Furthermore, their use allows for real-time tracking of progress, helping therapists adjust interventions dynamically based on quantifiable changes in mobility and muscle function—factors critical in managing mechanical neck pain.

Incorporating these technologies into routine clinical practice bridges the gap between subjective evaluation and objective rehabilitation, reinforcing a data-driven, evidence-informed approach to managing neck pain and restoring spinal health.

Such tools can validate clinical findings, detect subclinical asymmetries, and track treatment outcomes with objective data, improving both patient understanding and clinician decision-making.

Clinical Relevance

Cervical lordosis is integral to shock absorption, neural foramen patency, and the distribution of axial loads. When the natural curve is compromised—due to poor posture, degenerative changes, or muscular imbalances—it leads to mechanical strain, altered sensorimotor control, and chronic pain [3-13]. Physiotherapists are uniquely positioned to address these issues; however, current practice often underutilizes technological tools that can enhance assessment accuracy and therapeutic precision.

This commentary highlights the importance of integrating objective device-based assessment with traditional conservative management for individuals suffering from neck pain linked to cervical spine dysfunction. While radiographic measures like Cobb’s angle provide insight into spinal alignment, clinical tools such as Nordic health devices offer real-time, quantifiable data on cervical range of motion (ROM) and muscle strength [5,6,16], enabling therapists to identify specific impairments contributing to altered spinal posture. By identifying limitations in mobility and deficits in muscle strength, therapists can design targeted intervention plans such as postural correction, strengthening, and manual therapy—which can indirectly promote the normalization of cervical curvature, reduce mechanical strain, and improve patient outcomes. Aimed at restoring natural cervical curvature.

Clinical Application: Conservative management integrates:

Manual Therapy

Joint mobilizations to improve segmental cervical and thoracic mobility, Myofascial release to ease soft-tissue restrictions in suboccipitals, levator scapulae, and upper trapezius [14-20].

Postural Correction & Ergonomic Training

Biofeedback-assisted exercises (e.g., mirror work, laser guidance) to retrain neutral cervical alignment [16-18].

Ergonomic Advice:

- Sit with screen at eye level, elbows at 90°, and feet flat
- Take a 20-second break every 20 minutes to reset posture
- Use lumbar and neck support to maintain natural spinal curves
- Safe lifting mechanics: avoid neck extension and forward head when handling loads
- Home-and work-station checklists and patient education handouts for self-monitoring.

Therapeutic Exercise

Neuromuscular Control: Deep cervical flexor activation (cranio-cervical flexion with pressure biofeedback)

Cervical Stabilization: Isometric holds in flexion/extension and side-bending [19].

Thoracic Mobility: Thoracic extension over a bolster or foam roller and PNF patterns.

Strengthening & Integration

- Scapular stabilizer strengthening (rows, scapular squeezes) to support upper-quarter alignment
- Core activation (plank variations, dead-bug) to reinforce overall po

Outcome Measures: To monitor effectiveness, therapists may use:

- **Numeric Pain Rating Scale (NPRS)** – subjective pain intensity
- **Neck Pain and Disability Index (NPAD)** – functional limitation
- **Device-based cervical ROM and strength data** – objective functional assessment [5-6,16]
- **Photogrammetric postural analysis** – non-radiographic assessment of cervical-thoracic posture
- **Cobb’s angle (when indicated radiographically)** – long-term postural changes

Together, these measures help correlate structural and functional improvement with patient-reported outcomes.

Supporting Evidence

Neck pain associated with altered cervical alignment has long been recognized in physiotherapy literature. A key study by McAviney *et al*., (2005) found that individuals with a cervical lordosis of less than 20° had a significantly higher likelihood of chronic neck pain compared to those with a curvature within the normal range of 31°–40° [11]. These findings emphasize the clinical value of maintaining or restoring physiological cervical alignment.

Similarly, Harrison *et al*., (1996) underscored the biomechanical importance of cervical lordosis, noting its role in distributing mechanical loads, facilitating functional head posture, and minimizing stress on adjacent spinal structures [12]. Loss of this curvature can result in compensatory strain on soft tissues and joints, contributing to pain and functional limitations.

In managing such dysfunctions, conservative physiotherapy remains a cornerstone. Badve and Charak (2021) highlighted that interventions such as manual therapy, postural correction, and targeted exercises are effective in alleviating symptoms and improving functional outcomes in patients with cervical spine disorders [9]. Fuentes *et al*., (2017) further emphasized that strengthening deep cervical flexors and retraining proprioception not only improve muscular coordination but may also contribute to postural realignment over time [8].

To enhance clinical precision, the integration of device-based assessment tools has been proposed. Devices such as Nordic health systems enable physiotherapists to objectively measure cervical range of motion (ROM) and isometric strength, offering reproducible metrics that can inform individualized care [4-6,16]. In a study by Suni *et al*., (2018), patients whose treatment was guided by objective, device-based assessment experienced superior improvements in mobility and pain compared to those evaluated using traditional manual techniques [5]. MacIntyre *et al*., (2018) also observed that device-driven assessments improved patient compliance, goal tracking, and the ability to modify interventions with data-driven insight [4].

While these tools do not directly measure Cobb's angle, the functional data they generate allow clinicians to target specific deficits contributing to postural misalignment. Over time, improvements in cervical mobility and neuromuscular strength can indirectly influence spinal curvature, especially in cases where postural abnormalities are a driving factor.

CONCLUSION

Despite decades of clinical research, neck pain remains one of the most common and misunderstood musculoskeletal symptoms, especially when associated with abnormal cervical curvature.

In the modern day of evidence-based rehabilitation, physiotherapists need to embrace the use of objective, device-based evaluation techniques and move past conventional, subjective assessments. Measurable information about cervical mobility and muscle function—two important factors in the etiology and treatment of mechanical neck pain—is provided by these technologies.

Instead of replacing clinical expertise, we support the regular integration of these tools into conservative management plans as a means of improving accuracy, responsibility, and customized treatment. These techniques, when paired with manual therapy, posture retraining, and focused exercise, have the potential to completely transform the way physiotherapists monitor results and maximize interventions.

Physiotherapists must ultimately embrace a hybrid strategy that combines the latest technology with conventional therapy expertise in order to enhance outcomes for patients with cervical spine dysfunction. Our ability to innovate will determine the direction of spinal care in the future.

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