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Technical Note

Revolutionizing "Text Neck Syndrome" Management: Paradigm Shifting from "Posture Correction" to "Posture Change"

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Purpose: The pervasive use of mobile devices has precipitated an increase in musculoskeletal disorders, notably "text neck syndrome" (TNS), characterized by neck pain, stiffness, and dysfunction due to prolonged forward head posture. Traditional management strategies have focused on static posture correction exercises, but recent research advocates for a paradigm shift towards a dynamic and holistic approach, emphasizing joint-specific mobility and stability. This technical note critiques the limitations of conventional posture correction and explores the scientific basis for the joint-by-joint approach (JBJA) training program, which prioritizes mobility restoration to promote sustainable posture change.
Conclusions: The JBJA model highlighted the necessity of addressing the entire kinetic chain, particularly the thoracic spine and shoulder girdle, to alleviate cervical spine strain. Evidence from recent studies supports the efficacy of this approach in reducing TNS symptoms and improving overall posture. Implementing posture change into TNS management involves education, technology-assisted reminders, environmental modifications, and movement-based interventions. This shift not only addresses the biomechanical imbalances that contribute to TNS but also empowers patients to actively manage their condition, fostering long-term well-being.

Keywords: Biomechanical Phenomena; Holistic Health; Musculoskeletal Pain; Joint Stability and Mobility; Spine

Introduction

The ubiquitous presence of mobile devices has triggered a surge in musculoskeletal disorders, with "text neck syndrome (TNS)" emerging as a prominent concern [1]. Characterized by neck pain, stiffness, and dysfunction due to prolonged forward head posture [2], TNS poses a significant challenge for healthcare professionals [3]. Traditional management strategies often focus on static posture correction exercises [2]. However, recent (*ie*; 2014-2024 decade) research suggests a paradigm shift towards a more holistic approach, a "joint-by-joint approach (JBJA)" training program that prioritizes mobility restoration, ultimately promoting sustainable posture change [4,5].
This editorial delved into the limitations of conventional posture correction and explores the scientific rationale behind this novel approach, highlighting its potential to revolutionize TNS management.

Understanding text neck syndrome and its widespread impact

TNS arises from the repetitive stress placed on the cervical spine due to prolonged flexion during mobile device use [2]. The forward head posture significantly alters the biomechanical load distribution on cervical [6]. While the weight of the head remains constant at approximately 10-12 pounds (*i.e.*; 4.53-5.44 kg), the effective force exerted on the neck increases dramatically with forward tilt [7]. At a 60-degree forward inclination, the cervical spine must counteract forces equivalent to more than 60 pounds (*i.e.*; 27.21 kg) to maintain head position [8]. This amplification of force results from the increased moment arm between the center of mass of the head and the cervical spine's axis of rotation, leading to greater stress on neck muscles, ligaments, and intervertebral discs [7,8]. This excessive strain on the cervical spine can lead to chronic neck pain, muscle tightness, and potentially even degenerative changes over time [8].
The detrimental effects of TNS extend beyond the neck, impacting various aspects of musculoskeletal health [6,9]. Research suggests a link between TNS and lower back pain, headaches, jaw dysfunction, and even cosmetic concerns related to posture [3,9,10]. For instance, one study identified a direct correlation between smartphone use and neck pain in college students, highlighting the potential long-term burden on healthcare systems posed by this growing epidemic [11].

Symptoms and Consequences of TNS

Prolonged forward head posture associated with TNS leads to imbalances in the musculature [8]. Tightness in the neck and shoulder extensors, coupled with shortening of the chest muscles, creates a characteristic hunched posture. This misalignment manifests as neck and shoulder pain, stiffness, and potentially

pinched nerves [12]. Additional symptoms may include radiating pain, headaches, weakness, numbness, and upper back tension [13]. Furthermore, emerging evidence suggests a possible link between TNS and temporomandibular joint disorders and rotator cuff impingement [14].

Limited efficacy of traditional posture correction for TNS

Traditional management of TNS has often relied on posture correction strategies [15]. These typically involve static ergonomic adjustments and exercises designed to maintain a neutral cervical spine [15]. While these approaches may offer temporary relief, update research casts doubt on their long-term effectiveness [16]. Dandale et al. [16] highlighted that posture correction exercises, although beneficial in the short term, fail to address the underlying functional limitations that contribute to TNS. Additionally, the static nature of these interventions neglects the dynamic postures adopted during daily activities, limiting their real-world application [11].

The concept of maintaining a single "ideal" posture for prolonged periods has also been challenged [6,17]. Some studies suggested that there is no universal optimal posture, and that enforcing a fixed position, even if deemed "correct", can lead to muscle fatigue and discomfort over time [6,17]. A systematic review [18] reported limited evidence supporting the effectiveness of posture correction exercises in reducing neck pain associated with device use.

The need for a paradigm shift: from "posture correction" to "posture change"

Human physiology thrives on movement, not static positioning [19]. Maintaining any posture for extended periods, regardless of its perceived correctness, can have negative consequences [6,17]. Waongenngarm et al. [19] reported that regular postural variations throughout the day significantly reduced neck pain and improved comfort in office workers compared to those following strict postural guidelines. This finding aligns with the concept of "movement variability", defended by Srinivasan & Mathiassen [20]. The latter concept emphasizes that variability in movement patterns is not only normal but crucial for optimal function and health [20].

These limitations of traditional posture correction highlight the need for a paradigm shift towards a more dynamic and holistic approach for TNS management. This shift is supported by the JBJA training model, which emphasizes the importance of joint-specific mobility and stability [21,22]. As proposed by Cook and Boyle [23,24], effective movement and function rely on a harmonious balance between mobile joints, such as the thoracic spine and hips, and stable joints, such as the lumbar spine and knees. Applying this concept to TNS underscores the necessity of addressing not just the cervical spine but also the function of adjacent joints [21,22].

The joint-by-joint training approach: a holistic solution for TNS

The JBJA training approach offers a more holistic solution by addressing the underlying biomechanical imbalances that contribute to TNS [23-25]. This approach prioritizes improving mobility and stability throughout the kinetic chain, with a particular focus on the thoracic spine and shoulder girdle, regions frequently limited in TNS patients [26]. Techniques like thoracic spine mobilizations, scapular control exercises, and thoracic spine rotations are employed to enhance mobility in these key segments [27].

The effectiveness of the JBJA training approach is supported by the findings of some studies [16,25,27]. First, Cho et al. [25] demonstrated that interventions targeting thoracic spine mobility and scapular stability significantly reduced neck pain and improved overall posture in individuals with TNS. Second, by improving mobility in the thoracic spine and shoulder girdle, the JBJA allows for a more natural and sustainable neutral head position to be achieved, ultimately reducing strain on the cervical spine and promoting long-term pain relief [16,27].

Table 1. Strategies for effective posture change integration in text neck syndrome (TNS) management.

Strategy	Description	Supporting evidence
Education and awareness	Inform patients about the benefits of postural variability. Understanding the rationale behind posture change increases adherence to interventions.	Individuals who understood the rationale behind posture change were more likely to adhere to interventions [31].
Technology-assisted reminders	Use smartphone applications and wearable devices to prompt regular posture changes. These technological interventions significantly improve adherence to posture change protocols.	Such technological interventions significantly improved adherence to posture change protocols [28].
Environmental modifications	Encourage the use of adjustable workstations and varied seating options to facilitate natural posture changes. Proper use of sit-stand desks reduces neck discomfort and improves productivity.	Sit-stand desks, when used correctly, reduced neck discomfort and improved productivity in office workers [29].
Movement-based interventions	Incorporate dynamic exercises and stretches throughout the day to complement posture change strategies. These brief movement interventions are more effective in reducing TNS symptoms than static stretching alone.	Brief movement interventions, when combined with posture change prompts are more effective in reducing TNS symptoms than static stretching alone [30].

Implementing a dynamic approach: posture change for TNS management

Strategies for Effective Posture Change Integration

Healthcare professionals can integrate posture change into TNS management through several evidence-based strategies [7,28-30]. Table 1 outlines four strategies healthcare professionals can use to integrate posture change into TNS management effectively. Each strategy is supported by evidence from recent studies, emphasizing the importance of education, technology, environmental modifications, and movement-based interventions in promoting sustainable posture change. Shifting the focus from "posture correction" to "posture change" offers a more sustainable and effective approach to TNS management [27,28]. By implementing these strategies, healthcare professionals can empower patients to achieve a natural, pain-free posture, ultimately improving their long-term well-being.

Challenges and Future Directions

While the evidence supporting posture change is compelling, implementing this approach in real-world settings presents challenges. Future research should focus on:

i) Long-term efficacy studies to determine the sustained benefits of posture change interventions.

ii) Developing personalized posture change protocols based on individual biomechanical profiles.

iii) Investigating the potential synergistic effects of combining posture change with other interventions, such as strengthening exercises or manual therapy.

Conclusions

The management of TNS is undergoing a crucial transformation. Emerging evidence compels a shift from static posture correction towards a more dynamic approach - posture change. This paradigm shift is grounded in biomechanics and supported by recent research demonstrating the benefits of frequent postural variations. The JBJA training model exemplifies this shift. By addressing mobility limitations throughout the kinetic chain, it tackles the underlying biomechanical imbalances that contribute to TNS, promoting long-term pain relief and improved function. Additionally, an emphasis on posture change empowers patients to take an active role in managing their condition, fostering sustainable improvements in posture and overall well-being.

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