



The Role of Viscoelastic and Psychosocial Factors in Upper Trapezius Pain in Individuals with Chronic Neck Pain



Berkant Anil Ozcelik, PT¹, Hatice Cetin, PT, PhD¹, Duru Ceren Yavuz, PT¹, Sibel Bozgeyik-Bagdatli, PT, PhD¹

¹Hacettepe University Faculty of Physical Therapy and Rehabilitation



Objective

To explore the relationship between upper trapezius muscle pain thresholds and viscoelastic properties (oscillation frequency, mechanical stress relaxation time, dynamic stiffness, logarithmic decrement-elasticity, and relaxation-creep ratio) and psychosocial factors (stress and depression) in individuals with chronic neck pain.



Figure 1



Figure 2

Figure 1: Measuring of muscle mechanic properties in upper portion of the Trapezius muscle by hand-held MyotonPRO device (Myoton Ltd, Estonia).

Figure 2: The hand-held MyotonPRO device (Myoton Ltd, Estonia).

Results

- Logarithmic decrement-elasticity was significantly associated with pain threshold ($p = 0.012$, $\beta = 1.731$).
- The participants had a mean Neck Disability Index (NDI) score of 25.89 ± 8.32 , indicating a moderate level of neck-related disability.
- Higher perceived stress ($p = 0.023$, $\beta = 1.001$) and depression ($p = 0.037$, $\beta = 0.646$) correlated with lower pain thresholds.
- Other viscoelastic parameters showed no significant associations ($p > 0.05$).

Methods

Participants:

27 individuals with chronic neck pain (mean age = 23.74 ± 2.65 years, BMI = 23.21 ± 3.66).

Assessment Tools:

- Neck Disability Index is used as a criteria for chronic neck pain.
- Pain threshold measured on the painful side of the upper trapezius.
- Independent variables: Cranio-cervical angle, Perceived Stress Scale (PSS), Beck Depression Inventory (BDI), and myometric measurements assessed bilaterally.
- Multiple linear regression model used to identify pain threshold predictors.

Conclusion

Elastic properties of the upper trapezius and psychosocial factors like stress and depression play a significant role in pain perception in individuals with chronic neck pain.

These findings highlight the importance of a biopsychosocial approach in musculoskeletal pain management and emphasize integrating both mechanical and psychological assessments for better treatment outcomes.