

# Association of Forward Head Posture with Cervical Mechanosensitivity, Neck Disability, and Anxiety in Indian Young Adults: A Cross-sectional Study

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## ABSTRACT

**Introduction:** Forward Head Posture (FHP) is a common postural deviation increasingly observed among young adults due to prolonged smartphone use, sedentary behaviour, and academic activities. Sustained anterior translation of the head may alter cervical biomechanics, increase mechanical stress on musculoskeletal tissues, and contribute to functional and psychological disturbances.

**Aim:** To investigate the association of FHP with cervical mechanosensitivity, neck disability, and anxiety in Indian young adults.

**Materials and Methods:** A cross-sectional observational study was conducted among 100 participants aged 18-25 years recruited from academic institutions in North India. Participants were classified into an FHP group {craniovertebral angle (CVA)  $<50^\circ$ } and a Normal Head Posture group (CVA  $\geq 50^\circ$ ) using digital photogrammetry. Cervical mechanosensitivity was assessed bilaterally over the upper trapezius and levator scapulae muscles using Pressure Pain Threshold (PPT) measured with a digital algometer. Functional disability was evaluated using the Neck Disability Index (NDI), while

anxiety levels were assessed using the anxiety subscale of the Depression Anxiety Stress Scale-21 (DASS-21). Statistical analysis included an independent samples t-test and Pearson correlation analysis with significance set at  $p < 0.05$ .

**Results:** Participants with FHP demonstrated significantly lower PPT values over the upper trapezius and levator scapulae muscles compared to participants with normal head posture ( $p < 0.001$ ). The FHP group also showed significantly higher NDI scores and elevated DASS-21 anxiety scores ( $p < 0.05$ ). Craniovertebral angle demonstrated a positive correlation with PPT values and a negative correlation with neck disability and anxiety scores.

**Conclusion:** FHP is significantly associated with increased cervical mechanosensitivity, greater neck disability, and elevated anxiety levels in Indian young adults. A reduced craniovertebral angle may negatively influence both physical and psychological health. Early postural assessment and multidimensional rehabilitation strategies may help reduce associated musculoskeletal and psychosocial complications.

**Keywords:** Anxiety, Craniovertebral angle, Forward head posture, Neck disability, Pressure pain threshold, Young adults.

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