ABSTRACT

Background: Neck pain is a common musculoskeletal disorder mainly affecting young adults worldwide, with postural abnormalities, altered muscle length, and body composition playing key roles. The craniovertebral angle (CVA), pectoralis major (PM) muscle length, upper trapezius (UT) muscle length, and body mass index (BMI) are clinically relevant parameters that may influence the severity of neck pain. However, investigated their if any combined correlation in young college students.

Methodology: An observational study was conducted on 96 college students (70 males, 26 females; mean age 21.16 ± 1.81 years) with mild to moderate neck pain (NPRS 1–6). BMI was calculated from measured height and weight. CVA was assessed using photogrammetric analysis via Kinovea software. Pectoralis major and upper trapezius muscle lengths were measured bilaterally using standard clinical tape measurement techniques. Neck pain was quantified using the Numeric Pain Rating Scale (NPRS). Spearman's rank-order correlation was used for statistical analysis due to non-normal distribution of NPRS and BMI data (Shapiro-Wilk test).

Results: Pectoralis major length showed a statistically significant negative correlation with neck pain (rho = -0.210, p = 0.040). CVA demonstrated a marginal negative trend with NPRS (rho = -0.185, p = 0.071). Upper trapezius length showed a marginal negative correlation (rho = -0.195, p = 0.057). BMI did not independently correlate with neck pain (rho = +0.151, p = 0.143), though it was significantly correlated with CVA (rho = -0.483, $p < 0.001$) and PM length (rho = +0.376, $p < 0.001$), suggesting an indirect role in neck pain via postural and muscular pathways.

Conclusion: Pectoralis major tightness was the only statistically significant correlate of neck pain intensity in this population. CVA and upper trapezius length showed clinically meaningful marginal trends. BMI influences neck pain indirectly through its effect on posture and muscle length. A multimodal physiotherapy approach targeting chest tightness, forward head posture correction, and cervical muscle length is recommended.

Keywords: *Neck pain; craniovertebral angle; Body Mass Index; pectoralis major; upper trapezius; Numeric Pain Rating Scale; forward head posture*

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