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## The Association between non-specific Neck pain and forward head posture: A cross-sectional study

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**Background:** Poor posture is traditionally linked with various musculoskeletal disorders. Consequently, musculoskeletal educators have been teaching postural observation as part of the physical evaluation. Forward Head Posture (FHP) is hypothesized to be linked with neck pain; however there is no clear evidence in this topic

**Purpose:** To investigate the association between FHP and neck pain disability, intensity, and cervical kinematics in individuals with neck pain compared to asymptomatic individuals. A secondary objective of this study was to explore the possible effect of a head-mounted display (HMD) used in a virtual reality (VR) assessment on FHP.

**Methods:** The study was conducted among aged 19 to 62 with 43 volunteers (23 individuals with neck pain, 20 asymptomatic individuals). FHP was determined by measuring craniocervical angle on profile pictures. Secondary outcome measures

included the neck disability index (NDI) questionnaire, pain intensity, and neck kinematics using specialized VR software.

**Results:** In FHP, there were no significant differences between individuals with neck pain and asymptomatic individuals (craniocervical angle =  $48.24^{\circ} \pm 7.29$ ;  $48.90^{\circ} \pm 5.89$ , respectively,  $p > 0.05$ ). The neck pain individuals demonstrated a more restricted range of motion and slower neck movements ( $p < 0.05$ ). We mainly found that there is no significant association between FHP and visual analog scale, NDI, and most neck kinematic measures.

**Conclusions:** Our findings cannot support a clinically applicable correlation between FHP and neck pain. Additionally, individuals with neck pain showed lower range of motion and slower neck movements.

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