Abstract

Background: Flat foot (pes planus) is a common postural deformity that may influence biomechanical functions across the lower extremity. Its altered gait patterns has been explored in previous literature, though often in isolation. The potential compensatory mechanisms, particularly in young adults, remain under-investigated in an integrated manner.

Objective: This study aims to examine the correlation between flat foot and gait mechanics among young adults, with a focus on identifying biomechanical adaptations and differences in gait between individuals with and without flat feet.

Method:A cross-sectional study was conducted involving 32 undergraduate students aged 18–25 from Brainware University. Participants will be screened using the Chippaux-Smirak Index (CSI) to classify foot posture. Gait was analyzed using video capture and software-based analysis. Comparisons were made between flat-footed and normal-footed individuals across gait parameters.

Result:ANOVA analysis revealed significant differences ($p < 0.05$) across all stance phase subphases between flat feet and normal feet groups. Mann-Whitney U test showed significant CSI score differences ($p < 0.00001$). Flat feet individuals demonstrated strong correlations between CSI scores and terminal swing ($r = 0.70$) and pre-swing phases ($r = 0.60$), with negative mid-stance correlations ($r = -0.59$). Normal feet individuals showed weaker correlations across all phases.

Conclusion:Flat feet individuals exhibit significant biomechanical alterations throughout stance phases with severity-dependent gait changes. Structural foot abnormalities create systematic compensatory movement patterns affecting the lower kinetic chain. Results support comprehensive gait assessment needs and early intervention strategies for flat feet populations.

Keywords:flat foot,CSI score,gait analysis,correlation,gait phases

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