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Gender Differences in Gait Symmetry and Pelvic Motion: Insights From G-Sensor Analysis in Albanian Youth Aged 11 To 16

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Abstract

An important turning point in motor development is learning to walk without assistance. The child's gait is gradually stabilized until they reach a mature walking pattern at the age of seven. The main objective of this study was to analyse and assess the gait of children aged 11 to 16 and to compare boys' and girl data results A total of 109 children (49 boys & 60 girls) were randomly chosen from several Albanian elementary schools. Gait analysis was evaluated using the G-WALK Wearable inertial sensor for motion analysis from BTS Bioengineering. Main measures were the gait Cycle (Symmetry Index), Pelvic Angle (Symmetry Index, Tilt, Obliquity, and Rotation). G-sensor measurements of gait and pelvic motion parameters were analyzed for 49 male and 60 female participants. Regarding boys, the average Gait Symmetry Index was 94.20 ± 4.64, and their range is from 77.4 to 99.1. The results indicate Pelvic Tilt with 81.99 ± 18.95, Pelvic Obliquity with an average of 83.99 ± 19.50, and Pelvic Rotation-86.82 ± 20.61. Thus, these parameters show the amplitude within which male participants may walk concerning pelvic motility or even symmetry. The average Gait Symmetry Index for girls was slightly higher at 95.63 ± 4.08, with values ranging from 77.9 to 99.3. Pelvic Tilt had a mean of 75.50 ± 22.98, while Pelvic Obliquity and Pelvic Rotation averaged 91.15 ± 10.82 and 93.05 ± 9.98, respectively. These findings present a broad-based normative profile of gait and pelvic motion characteristics, underlining gender differences and the variability of these parameters within the sample. Such data could form the basis for further investigations into biomechanics, the prevention of injury, or rehabilitation.

Keywords*:* Gait analysis, Gait Cycle, Pelvic Angle, Children