An Analysis of Discrete Biomechanical Loading Outcomes and Steps per Day in Knee Osteoarthritis Patients

Individuals with knee osteoarthritis (OA) exhibit biomechanical differences compared to healthy individuals, including different loading patterns. Vertical ground reaction force (vGRF) and external knee adduction moment (KAM) have been used to assess loading magnitude and location, with both excessive and insufficient loading associated with disease progression. Achieving 6,000 steps per day has been recognized as a preventative measure against functional limitation. It is unknown whether individuals with differing activity levels exhibit differences in biomechanical peak loading outcomes. PURPOSE: To evaluate between-group differences in biomechanical loading outcomes for individuals with knee osteoarthritis who meet 6,000 steps per day and those who do not. METHODS: 19 individuals (62.63 ± 8.90 yrs) with radiographic knee OA (≥1 on the Kellgran-Lawrence Scale and BMI < 35) participated in a gait assessment and physical activity monitoring (GT9X Link). Between-group comparisons were conducted using t-tests for vGRF peak 1, vGRF peak 2, and peak KAM. Effect size was measured via calculated Hedge's g values. RESULTS: 8 individuals were classified as meeting the step goal and 11 did not. Our analysis did not show statistically significant between-group differences for any of the biomechanical outcomes. CONCLUSION: Understanding real-world loading magnitude and frequency and its relationship with activity level is complex but may be important in designing clinical interventions, targeting lifestyle modifications.