

Sedentary Behaviour, Physical Activity, and Cardiovascular Health in Adults With Osteoarthritis: A Cross-Sectional Comparison With Healthy Controls

Zoe Dawson, Sophie Carter, Alexander Beaumont

York St John University, York, United Kingdom

Purpose: World-wide, osteoarthritis (OA) is a leading cause of number of years lived with disability. Those with OA have poor adherence to physical activity (PA) guidelines and engage in high levels of sedentary behaviour (SB). More than eight hours a day of SB has independent health risks, negatively affecting cardiovascular health. The impact of PA and SB on cardiovascular health in osteoarthritic populations has not been explored. This study aimed to (1) compare differences between PA, SB, and cardiovascular health in individuals with lower limb OA to healthy controls and (2) establish relationships between these behaviours and cardiovascular health.

Methods: A cross-sectional study was conducted with 37 participants over 45 years of age. The OA group, excluding rheumatoid arthritis, ($n = 17$) were diagnosed by a healthcare professional. The control group ($n = 20$) were age-matched, and all participants were free from cardiovascular disease. Blood pressure (BP), carotid artery intima thickness (CIMT), and brachial artery endothelial function using flow-mediated dilation (FMD) were assessed. Participants wore two activity monitors for seven consecutive days tracking moderate-to-vigorous PA (MVPA), step count, and SB. Analysis utilised Student's *t*-test and partial correlations.

Results: No significant differences were found between groups in MVPA (OA: 284 ± 157 min/week; Control: 314 ± 179 min/week; $p > 0.05$), total SB (OA: 9.1 ± 1.6 hours/day; Control: 8.6 ± 1.4 hours/day; $p > 0.05$), systolic BP (OA: 131 ± 18 mmHg; Control: 122 ± 15 mmHg; $p > 0.05$), CIMT (OA: 0.68 ± 0.15 mm; Control: 0.65 ± 0.10 mm; $p > 0.05$) or FMD (OA: $4.1 \pm 3.0\%$; Control: $5.3 \pm 2.7\%$; $p > 0.05$). Within the OA group, partial correlation analysis (controlling for age, sex, and body mass index) revealed significant associations between 1–2 hour sedentary bouts and systolic BP ($r = +0.58$, $p = 0.04$), and between MVPA and step count with CIMT ($r = -0.68$, $p = 0.01$ and $r = -0.58$, $p = 0.03$, respectively).

Conclusion: The lack of between-group differences in cardiovascular health markers could be due to similar activity profiles, particularly high MVPA. In the OA group, prolonged bouts of SB were associated with higher systolic BP, suggesting how SB is accumulated may be important for cardiovascular health. Despite meeting PA guidelines, this OA sample accumulated high levels of SB, to a level with known independent health risk. Future interventions should prioritise strategies to reduce SB.

