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The Associations of Sedentary Behaviour and Physical Activity With Musculoskeletal Disorders in Hybrid-Office Workers: A Compositional Data Analysis

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Purpose: The aims of the present study are (1) to examine sedentary behaviour and physical activity patterns in hybrid-office workers in home and office contexts, and (2) to assess the associations of such activity patterns with musculoskeletal symptoms.
Methods: The present study collected data from hybrid-office employees from Ireland, Slovenia, Spain, and the Netherlands. Device-based measures (i.e. *activPAL*) were used for assessing sitting, standing, light and moderate-to-vigorous intensity physical activity, and sleeping in different contexts, while self-reported data assessed the musculoskeletal symptoms (i.e. Standardised Nordic Questionnaire). A compositional data analysis was employed to determine activity patterns and investigate its associations with employees' musculoskeletal symptoms.
Results: A total of 163 hybrid office workers (39 years old, interquartile range (IQR): 19; 71.8% females) were enrolled in the study. Most of them (80%) worked from home from 2 to 4 days a week. On average, participants work 8.08 hours at home and 8.39 in the office ($p = 0.012$). However, occupational sitting time during home-office work is higher than during location work (6.61 h/8 h workday and 6.27 h/8 h workday, respectively; $p < 0.001$). Occupational sitting time is spent mainly in short bouts (<30 minutes; 3.06 h/8 h workday in the office location and 2.61 h/8 h workday at home). However, home-office workers spend sitting time in longer bouts (>60 minutes) than in the office location (1.94 h/8 h workday and 1.18 h/8 h workday, respectively), but non-statistically significant differences were identified. Regarding physical activity, differences between home-office and location work were found for light-intensity (0.28 and 0.27 hours per 8 hours of workday, respectively; $p < 0.001$) and moderate-to-vigorous intensity of occupational physical activity (0.08 and 0.18 hours, respectively; $p < 0.001$). Higher time spent for occupational sitting time was associated to greater risk of suffering any musculoskeletal symptom ($p = 0.023$), especially those days that employees work from home ($p = 0.016$).
Conclusion: This is one of the first studies providing evidence on the dynamic hybrid setting after the COVID-19 pandemic, which may inform policy guidelines and act as a starting point for future interventions targeting this context.
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