

Physical activity and sedentary time in relation to healthcare utilization and costs among middle-aged individuals – A Northern Finland Birth Cohort 1966 Study

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Background: Insufficient physical activity (PA) and excessive sedentary time (SED) are risk factors for a number of health problems and have been found to be associated with higher direct healthcare costs. Previous studies explain the direct costs of low PA by the use of healthcare services, but regular PA has also been shown to be associated with the higher use of preventive healthcare. Research on PA, SED and long-term healthcare utilization with register data and measured activity data is limited. This study examines the association of PA and SED with the healthcare visits and costs by utilizing measured PA and SED and both self-reported and register data for healthcare visits.

Method: The study uses data from the Northern Finland Birth Cohort 1966 -study. Register data about public healthcare visits include six years of outpatient and mental health visits at healthcare centres, as well as hospital outpatient and inpatient visits. Costs calculated from self-reported healthcare visits include public, private and occupational healthcare costs. Individuals (N=4567) were divided into three categories of moderate-to-vigorous physical activity (MVPA) and of sedentary time (SED). MVPA and SED were measured using a waist-worn triaxial accelerometer (Hookie AM20). A two-part hurdle negative binomial model and gamma GLM-model with log-link were used in the analysis.

Results: Compared with the lowest MVPA group, the most active females were approximately 5.7 percentage points (95% CI: -9.8 to -1.7) less likely to have healthcare centre visits and 5.8 percentage points (95% CI: -10.2 to -1.3) less likely to have hospital inpatient visits. The most active females had fewer hospital outpatient visits (-2.1, 95% CI: -4.0 to -0.1) and fewer days in hospital (4.8, 95% CI: -7.13 to -2.42). The most active males had fewer healthcare centre visits (-2.8, 95% CI: -4.53 to -1.09), hospital outpatient visits (-2.9, 95% CI: -4.99 to -0.75), hospital inpatient periods (-0.6, CI: -0.99 to -0.16) and hospital inpatient days (-5.2, 95% CI: -9.37 to -1.04). Males with high MVPA had lower total costs and community health centre costs compared with low MVPA group.

Males with the highest level of SED were 13 percentage points (95% CI: -18.1 to -7.9) and females were 7.7 percentage points (95% CI: -11.6 to -3.8) less likely to visit a healthcare centre compared with low SED group. The most sedentary females were also 5.1 percentage points (95% CI: -9.2 to -1.0) less likely to have a hospital outpatient and 5.6 percentage points (95% CI: -9.8 to -1.3) less likely to have a hospital inpatient visit. High sedentary females had fewer healthcare centre visits (-2.8, 95% CI: -4.27 to -1.39). High SED was associated with higher occupational healthcare costs for females and higher community health centre costs for males.

Conclusion: The results confirm that higher PA reduces the use of public healthcare. Similarly, high SED appears to reduce the use of public healthcare. The visits caused by high SED may be mainly related to occupational healthcare while low MVPA is also a burden on public healthcare.

Discussion: The study results shows that the burden and costs on public health services can be reduced by increasing individuals' PA. Further research is needed on SED, particularly in relation to occupational health. The results suggest that the occupational healthcare might bear the costs of SED and reducing excessive SED could thus reduce occupational healthcare costs.