Associations of Physical Activity and Sedentary Behavior with Healthy Survival, Disease, Disability, and Death in Older Women


**Background:** Physical activity levels decreases and sedentary time increases with age. Despite this, evidence suggests that even modest levels of physical activity may still reduce risk of death, disease, and disability among older adults. We aimed to quantify the level of risk associated with varying levels of physical activity and sedentary behavior in women aged 85 years and older.

**Methods:** Women from the Women’s Health Initiative who could live to ≥85 years old by September 1, 2010, the date clinical health outcomes were last reviewed, were categorized into four mutually-exclusive groups: 1) had no chronic disease or disability (“healthy”); 2) had ≥1 chronic disease but no disability (“diseased”); 3) had disability with or without chronic disease (“disabled”); and 4) died before reaching age 85 years. The association of baseline physical activity levels (n=27,998), summarized in metabolic equivalent (MET) hours/week, and baseline hours/day spent sitting (n=16,889) comparing “healthy” women to the other three outcomes was evaluated using polytomous logistic regression. Odds ratios (OR) and 95% confidence intervals (CI), adjusted for race/ethnicity, education, marital status, and baseline age, hormone use, smoking status, alcohol use, body mass index, and depression, were estimated.

**Results:** Baseline age range was 68-81 years. Mean (SD) baseline physical activity level was 12 (13) MET-hours/week (range: 0-134). The mean (SD) baseline MET-hours/week for women classified as healthy, diseased, disabled, and died were 15 (14), 13 (13), 10 (12), and 11 (12), respectively (p-trend<0.001). Relative to women in the highest physical activity quartile (≥17.5 MET-hours/week), the risk of being diseased, disabled, or of dying increased in a dose-dependent manner for women in the lower three physical activity quartiles. Women in the lowest quartile (0-<2.5 MET-hours/week) had the highest risk, with adjusted ORs (95% CIs) for being diseased, disabled, and of dying of 1.4 (1.3-1.6), 2.4 (2.1-2.7), and 2.2 (1.9-2.5), respectively. Similarly, women who spent ≥8 hours/day sitting had a higher risk of being disabled (adjusted OR=1.3, 95% CI=1.1-1.4) or of dying (adjusted OR=1.2, 95% CI=1.0-1.3), but were not at increased risk of being diseased (adjusted OR=1.0, 95% CI=0.9-1.1), compared to women who spent ≤5 hours/day sitting.

**Conclusions:** For older women, being physically active – even at modest levels – and avoiding long periods of sedentary behavior may improve the likelihood of surviving to age 85 years without major chronic disease and mobility disability. Since physical activity and sedentary lifestyle are modifiable behaviors, these findings may inform public health strategies aimed at preventing disease and disability, which may help to reduce healthcare and nursing care costs and improve overall quality of life.