

Among older women, 10,000 steps per day not needed for lower mortality

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In the world of step goals and activity trackers, the number 10,000 can sound like a magic one. Many wearable devices that track the number of steps a person takes each day come pre-programmed with a daily goal of

10,000 steps. But while a large body of evidence shows that physical activity is good for a person's health and longevity, few studies have examined how many steps a day are associated with good health, particularly long-term health outcomes. A new study led by investigators from Brigham and Women's Hospital sought to address this knowledge gap by examining outcomes over an average of more than four years for older women in the Women's Health Study who had measured their steps for a full week. The team reports that, among older women, taking as few as 4,400 steps per day was significantly associated with lower risk of death compared to taking 2,700 steps per day. Risk of death continued to decrease with more steps taken but leveled off at around 7,500 steps per day—less than the 10,000 steps default goal in many wearables. The team's results are presented today at the American College of Sports Medicine Annual Meeting and published simultaneously in *JAMA Internal Medicine*.

"Taking 10,000 steps a day can sound daunting. But we find that even a modest increase in steps taken is tied to significantly lower mortality in [older women](#)," said I-Min Lee, MBBS, ScD, an epidemiologist in the Division of Preventive Medicine at the Brigham. "Our study adds to a growing understanding of the importance of [physical activity](#) for [health](#), clarifies the number of steps related to lower mortality and amplifies the message: Step more—even a little more is helpful."

According to previous studies, the average number of steps taken by people in the U.S. is between 4,000 and 5,000 per day. The origin of the 10,000-step goal is unclear but may trace back to 1965, when a Japanese company began marketing a pedometer called Manpo-kei, which translates to "10,000 steps meter" in Japanese.

To conduct their study, Lee and colleagues included participants from the Women's Health Study, a randomized trial originally conducted to evaluate risk of cardiovascular disease and cancer among [women](#) taking

[low-dose aspirin](#) and vitamin E. When the original trial ended, participants were invited to participate in a long-term observational study. For the present study of steps and health, almost 18,000 women were asked to wear an ActiGraph GT3X+ accelerometer device—a research grade wearable—on their hips for seven consecutive days during all waking hours. The team analyzed 16,741 of the women who were compliant with wearing the device; their average age was 72.

Participants were followed for an average of more than four years, during which time 504 women died. Participants in the bottom 25 percent of steps walked (average of 2,700 steps per day) were at greatest risk of death, with 275 women dying. Those who walked modestly more (average of 4,400 per day) were at 41 percent lower risk of death. Risk of death continued to decrease with more steps walked, up to 7,500 steps per day, after which risk leveled off. The team also found that for women who walked the same number of steps per day, the intensity—how fast or slow they walked—was not associated with risk of death.

Due to the observational nature of the study, the authors cannot definitively separate cause from correlation (that is, to differentiate between "do more steps lower mortality?" or "do women in better health step more?"). However, the team did take several measures to try to ensure that the association observed was more likely causal than not, such as excluding women with heart disease, cancer, diabetes and less than excellent or good self-rated health and excluding the first year of follow-up data. The findings also are supported by previous experiments showing physical activity causes beneficial changes in short-term markers of health e.g., blood pressure, insulin/glucose levels, lipid profile, inflammation, and more.

The Women's Health Study included primarily older, white women, and further studies will be needed in younger and diverse populations to

determine if the findings are applicable to other groups, especially those who may, on average, take more steps. Other outcomes—such as quality of life and risk of specific diseases—were not assessed, but will be addressed in future studies.

"Of course, no single study stands alone. But our work continues to make the case for the importance of physical activity," said Lee. "Clearly, even a modest number of steps was related to lower mortality rate among these older women. We hope these findings provide encouragement for individuals for whom 10,000 steps a day may seem unattainable."

More information: Lee IM et al. "Association of Step Volume and Intensity With All-Cause Mortality in Older Women" *JAMA Internal Medicine*, DOI: [10.1001/jamainternmed.2019.0899](https://doi.org/10.1001/jamainternmed.2019.0899)

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