

# Physical activity may offset mortality risk caused by too much sitting

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For less active adults, the amount of time spent sitting may be associated with an increased risk of death; however, increasing physical activity to recommended levels may eliminate this association in some, according

to a study published today in the annual cardiovascular health promotion issue of the *Journal of the American College of Cardiology*.

Recent studies have determined that high levels of sedentary behavior are associated with adverse [health](#) outcomes. However, the link between sedentary behavior, mortality and [heart disease](#) are not always well understood.

In this study, researchers aimed to determine the association between sedentary behavior and [physical activity](#) on mortality and to estimate the effects of replacing sitting with standing, physical activity and sleep.

"Previous studies have not considered that a 24-hour day is finite and an increase in any type of physical activity or sedentary [behavior](#) would displace another activity or sleep," said Emmanuel Stamatakis, Ph.D., professor of physical activity, lifestyle and [population health](#) at the University of Sydney in Australia and lead author of the paper.

Participants included 149,077 Australian men and women aged 45 years and older who were asked to complete a questionnaire that determined how many hours per day an individual spent sitting, standing and sleeping. They also were questioned about the total time spent walking or participating in moderate or vigorous physical activity.

Daily sitting time was categorized as less than four hours, four to less than six hours, six to eight hours and more than eight hours. Weekly physical activity was categorized as no physical activity (inactive), 1-149 minutes (insufficiently active), 150-299 minutes (sufficiently active at the lower limit of Australian physical activity recommendations), 300-419 (sufficiently active at the upper limit but less than an hour of activity a day) and 420 minutes and over (highly active, at least an hour a day).

After a median follow up time of 8.9 years for all-cause mortality and 7.4 years for cardiovascular disease mortality, higher sitting times (more than six hours) were associated with higher all-cause and cardiovascular disease mortality risks, but mostly in those did not meet physical activity recommendations. Meeting even the lowest requirements for physical activity eliminated the association with all-cause mortality risk, with the exception of those who sat the most (more than 8 hours a day). Compared to those who were highly active and sat for less than four hours per day, the risk remained substantially elevated even among physically inactive participants who sat for 4 hours per day only.

"Our results support continued efforts to promote physical activity in those segments of the population that sit a lot for whatever reason," Stamatakis said. "In the absence of some physical activity, merely reducing sitting times may be insufficient for [better health](#)."

While replacing sitting with standing was associated with risk reduction in low sitters, replacing sitting with physical activity was more consistently associated with risk reduction in high sitters.

"A possible explanation for this is that among the most sedentary participants, standing may not be sufficient for reducing health risks," Stamatakis said. "Instead, substituting sitting for brisk walking may be a better option that is feasible by a majority of adults."

The researchers found that moderate physical activity only reduced cardiovascular disease death risk among high sitters. The largest replacement effects were seen for vigorous physical activity, but this level of activity may not be possible for all adults.

Replacing sitting with sleeping was not associated with changes in mortality risk in those who slept seven hours a day or less but was associated with increased risk in those who slept for more than seven

hours.

In an accompanying editorial comment, Charles E. Matthews, Ph.D., physical activity epidemiologist and investigator at the National Cancer Institute, writes that these findings demonstrate that there are a variety of ways to lower the [mortality](#) risks associated with a lack of physical activity and too much sitting.

"Given that sedentary behaviors appear to be vastly out-competing more healthy physical activity behaviors during our discretionary time, it is more important than ever to attend to our daily physical activity and sitting time to try to optimize both behaviors for better health," he said. "To this end, the report from Stamatakis and colleagues provide new and actionable insights for translating their findings to clinical and public health practice. "

**More information:** *Journal of the American College of Cardiology* (2019). [DOI: 10.1016/j.jacc.2019.02.031](https://doi.org/10.1016/j.jacc.2019.02.031)

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