

Does weather influence older adults' physical activity?

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"Older people in poor physical condition become less physically active if there's more rain in the summer. Higher temperatures, on the other hand, have a positive effect on their activity level in both summer and winter months," says Nils Petter Aspvik, a Ph.D. candidate at the Norwegian University of Science and Technology's (NTNU) Department of Sociology and Political Science.

As part of the Generation 100 exercise study for the Cardiac Exercise Research Group (CERG) at NTNU, Aspvik has measured the activity level of more than 1200 older adults in Trondheim. The goal has been to investigate how weather affects their activity level.

The results were published earlier this summer in the journal *PLOS ONE*.

"We can't do anything about the weather. But we can get better at considering how weather can be a barrier to [physical activity](#) when we develop new strategies for the [elderly](#) to become more physically active – especially individuals who are in poor physical shape," says Aspvik.

Focus on enjoying activity

Autumn is on its way and in Norway, at least, days are wetter and cooler, especially compared to the seemingly endless summer of 2018. So how do we manage to keep up our activity level?

Aspvik thinks there's no point in asking people to put up with bad weather to get their daily recommended dose of physical activity.

"Adapting your activity to the weather is both reasonable and smart in a lot of ways. What people should know is that getting into better physical shape requires so little effort," he says.

Instead of setting goals like walking 10 000 steps a day, the researcher recommends creating an activity plan tailored to an individual's own fitness level, interests and enjoyment.

"You don't have to take a walk solely with the goal of getting in better shape. You can have other goals, like enjoying nature, being social, finding peace, and so on. Then your improved fitness level becomes a nice bonus. It's much more pleasant to look at the beautiful scenery as you walk in the woods, or at a city's beautiful buildings, than to watch a heart rate monitor or a step counter all the time.

Weather matters less for the fit

In the recent study, the researchers divided the participants into categories based on whether they scored low, medium or high on a fitness test. The results from April to October showed that the least fit participants were less active the rainier it was, whereas rain and rainfall amount did not seem to affect the level of activity of those in better [physical condition](#).

"Physical condition is perishable – meaning that the participants who are in good physical shape are likely to be people who are active in everyday life and who exercise relatively regularly. It's easy to imagine that these individuals have acquired habits and attitudes in addition to their physical activity so that they don't regard bad weather as an obstacle," says Aspvik.

Between November and March it turned out that men in good shape were actually more active the more it rained.

"We can only speculate as to why that is, but we know that older men go skiing more often than women. And more elderly men than women report that they shovel snow in the winter," says Aspvik.

Most difference in the summer

The main goal of the Generation 100 study is to find out if exercise prolongs life for the elderly. The project includes men and women who were between 70 and 77 years old when the study started in 2012 and 2013.

At the start, each participant was given the task to wear an activity tracker for a whole week. Aspvik retrieved data about the activity level of the participants for every single hour of the tracked week and linked the information to the hour-by-hour data on temperature and precipitation from the Norwegian Meteorological Institute. This allowed him to determine how decisive a factor the weather was for the physical activity level of the elderly participants.

"The study also shows that changes in weather are more important for [activity levels](#) in the warmer months than in the winter months from November to March. Walking is the most common activity among the elderly, and we know from other studies that slippery surfaces and less daylight reduce [activity levels](#).

"Since people are more active in the summer months – and more activity happens outdoors – the weather also influenced activity levels more during this period," says Aspvik.

Indoor activity a plus

Earlier studies show that weather may also pose a barrier for physical activity in children, adolescents and adults.

"It may be important for people to have access to indoor training facilities, like a gym or large hall. Learning simple and time-efficient

ways to work out in your own home can also reduce weather as a barrier to physical activity," says Aspvik, who works as an assistant professor in sport sciences at NTNU's Department of Sociology and Political Science, in addition to carrying out his research.

Does exercise extend life?

Naturally, it's not only the [weather](#) that affects whether the elderly are physically active or not. Earlier, Generation 100 researchers showed that activity levels are higher the better the fitness level of the older adult. Women in the study have higher levels of activity than men, and both sexes are more active in the summer than in the winter months.

"Now we're hoping that the Generation 100 project can show us how [older people](#) can extend their years and make them more active and healthier years," says researcher Dorte Stensvold at NTNU's Department of Circulation and Medical Imaging – and CERG. She has been responsible for the completion of the study.

At the study's launch in 2012 and 2013, all 1200 participants were randomly assigned to three groups. Two groups receive guided training with high intensity and moderate intensity over five years, and the control group has been advised to follow the Norwegian Directorate of Health's physical [activity](#) recommendations.

"We've just finished the final five-year tests and are looking forward to sitting down and analysing the data," Stensvold says.

"And when do we get the answer to whether exercise extends life?" the reporter asks her.

"Hopefully before Christmas," says Stensvold.

More information: Nils Petter Aspvik et al. Do weather changes influence physical activity level among older adults? – The Generation 100 study, *PLOS ONE* (2018). [DOI: 10.1371/journal.pone.0199463](https://doi.org/10.1371/journal.pone.0199463)

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