Physical and social activities promote healthy brain aging, study finds

December 14 2023

Credit: Magda Ehlers from Pexels

Physical and social activities in old age have a protective effect on the entorhinal cortex, researchers at UZH have shown. This important area of the brain, which plays a central role in memory, is impaired in

patients with Alzheimer's disease, even in the early stages.

Physical exercise is associated with a variety of positive health aspects. Numerous studies have shown that regular physical activity has a preventive effect on cardiovascular diseases, diabetes, cancer, high blood pressure and obesity. But how do various leisure activities—physical, social and cognitive—affect brain health in old age?

A team of researchers from the University Research Priority Program Dynamics of Healthy Aging and from the Healthy Longevity Center of the University of Zurich (UZH) decided to investigate this question. Their study is published in *NeuroImage*.

To this end, they examined data from a comprehensive longitudinal study on brain development and behavior in old age. The longitudinal study was set in motion 12 years ago by Lutz Jäncke, meanwhile professor emeritus at UZH, who continues to supervise the project together with co-lead Susan Mérillat. The aim of the current research was to investigate the relationships between the thickness of the entorhinal cortex, memory performance and leisure activities in cognitively healthy adults over the age of 65, for a period of seven years.

Exercise and social activity slow down neurodegeneration

The entorhinal cortex, approximately 3.5 millimeters thick, is part of the cerebral cortex in the inner part of the temporal lobe and plays a key role in learning and memory. It is also one of the brain regions that is affected early on in the development of Alzheimer's disease. "Our findings show that in people who were more physically and socially active at the beginning of the study, the thickness of their entorhinal cortex decreased less over the seven-year period," says

neuropsychologist Jäncke.

The researchers also found that the thickness of the entorhinal cortex is closely linked to memory performance. The less the thickness of this brain structure decreased over the course of the study, the less memory performance was reduced. "Physical exercise and an active social life with friends and family are therefore important for brain health and can prevent neurodegeneration in later life," says Jäncke.

Brain can be trained like a muscle

It was also shown that higher memory performance at the beginning of the study was associated with a lower decline in memory performance over the course of the study. "These findings support the idea that we have a 'cognitive reserve,' and that the brain can be trained throughout our lives like a muscle to counteract age-related decline," says Isabel Hotz, one of the two first authors alongside Pascal Deschwanden. In other words, it pays to be physically, mentally and socially active throughout our lives, including in later life.

Fortunately, many older people in Switzerland already seem to be living by this credo: according to the Swiss Health Survey conducted by the Swiss Federal Statistical Office in 2022, about three-quarters of people over 65 get the recommended amount of physical exercise in their daily lives.

More information: Isabel Hotz et al, Associations between white matter hyperintensities, lacunes, entorhinal cortex thickness, declarative memory and leisure activity in cognitively healthy older adults: A 7-year study, *NeuroImage* (2023). DOI: 10.1016/j.neuroimage.2023.120461

Provided by University of Zurich