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# How exercise increases brain volume — and may slow memory decline

Overall, any exercise of any type and in even small amounts is likely to be 'a very good idea' for brain health, the leader of a new study says. DREAMSTIME/TNS

BY GRETCHEN REYNOLDS - THE WASHINGTON POST

**Exercising for 25 minutes a week, or less than four minutes a day, could help to bulk up our brains and improve our ability to think as we grow older.**

A new study that involved scanning the brains of more than 10,000 healthy men and women from ages 18 to 97 found that those who walked, swam, cycled or otherwise worked out moderately for 25 minutes a week had bigger brains than those who didn't, whatever their ages.

Bigger brains typically mean healthier brains.

The differences were most pronounced in parts of the brain involved with thinking and memory, which often shrink as we age, contributing to risks for cognitive decline and dementia.

“This is an exciting finding and gives us more fuel for the idea that being physically active can help maintain brain volume across the life span,” said David Raichlen, a professor of biological sciences and anthropology at the University of Southern California.

He studies brain health but was not involved with the new study.

The results have practical implications, too, about which types of exercise seem best for our brain health and how little of that exercise we may really need.

## LITTLE EXERCISE, BIG BRAIN

“We wondered, if we chose a very low threshold of exercise what would we see?” said Cyrus A. Raji, an associate professor of radiology and neurology at Washington University in St. Louis, who led the new study.

He and his colleagues were well aware that exercise is good for brains, especially as we age. Physically active older people are far less likely than the sedentary to develop Alzheimer’s disease or other types of memory loss and cognitive decline.

But he also knew that few people in the real world exercise much. “You hear that you need 10,000 steps a day,” he said, “or 150 minutes a week. But it’s very hard to reach” those goals.

Would less — even far less — exercise still help to build healthier brains, he and his colleagues wondered?

What about, for instance, 25 minutes of exercise a week, a sixth of the 150 minutes recommended in most formal exercise guidelines?

“It seemed an achievable amount for most people,” Raji said. But would it show effects on brains?

## 10,125 BRAIN SCANS

He and his colleagues turned to existing brain scans for 10,125 mostly healthy adults of all ages who’d come to the university medical center for diagnostic tests. Beforehand, these patients had provided information about their medical histories and how often and strenuously they’d exercised during the past two weeks.

The researchers divided them into those who’d exercised for at least 25 minutes a week and those who hadn’t. Then, with the aid of artificial intelligence, they began comparing scans and exercise

habits, looking for differences in brain volume, or how much space a brain and its constituent parts fill. More volume is generally desirable.

A clear pattern quickly emerged.

Men and women, of any age, who exercised for at least 25 minutes a week showed mostly greater brain volume than those who didn't.

The differences weren't huge but were significant, Raji said, especially when the researchers looked deeper inside the organ.

There, they found that exercisers possessed greater volume in every type of brain tissue, including gray matter, made up of neurons, and white matter, the brain's wiring infrastructure, which supports and connects the thinking cells.

More granularly, the exercisers tended to have a larger hippocampus, a portion of the brain essential for memory and thinking. It usually shrinks and shrivels as we age, affecting our ability to reason and recall.

They also showed larger frontal, parietal and occipital lobes, which, together, signal a healthy, robust brain.

MODERATE EXERCISE

"It was surprising and encouraging" to see such widespread effects in the brains of people who were exercising so little, Raji said.

Of course, this study was associational, meaning it showed links between exercise and brain health, but not that exercise necessarily caused the improvements.

So it's possible other lifestyle factors or genetics were at play, or that people with big brains just happened to like exercising.

But given the number of scans and the wide age range, Raji believes the effects of exercise on people's brains were real and direct and would help to maintain our ability to think well as we grow older.

Exactly how exercise might be altering brains is impossible to say from this study. But Raji and his colleagues believe exercise reduces inflammation in the brain and also encourages the release of various neurochemicals that promote the creation of new brain cells and blood vessels.

In effect, exercise seems to help build and bank a "structural brain reserve," he said, a buffer of extra cells and matter that could protect us somewhat from the otherwise inevitable decline in brain size and function that occurs as we age. Our brains may still shrink and sputter over the years. But, if we exercise, this slow decline starts from a higher baseline.

Perhaps best of all, the most effective exercise in the study was also relatively gentle. People who said they exercised moderately, meaning they could still chat as they worked out, wound up with somewhat greater brain volume than those who exercised more vigorously, such as by swift running.

But the numbers of vigorous exercisers were quite small, making comparisons suspect, Raji said, and their brain volume was still larger than among those who rarely, if ever, exercised at all.

Overall, any exercise of any type and in even small amounts is likely to be “a very good idea” for brain health, he said.

Raichlen agrees. “Studies like this continue to provide strong evidence that moving your body even a small amount may have an impact on brain health, and that it is never too early, or too late, to start.”