

Video games that help you exercise may also keep the brain fit, study shows



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Exercise video games could help counteract mild cognitive decline, a recent  study suggests. Image credit: Ivan Gener/Stocksy

- **Mild cognitive impairment can involve cognitive struggles and can increase someone's chances of developing dementia.**
- **Exergaming involves technology that requires physical activity and has possible cognitive benefits.**
- **One recent study found that serious exergaming may positively impact gray matter and white matter in the brain, and that these brain changes may be linked to cognitive improvements.**

[Exergaming](#) involves technology and requires physical activity. Essentially, it encompasses video games and virtual sports that encourage movement.

Experts are interested in how exergaming affects cognition, as it may offer benefits in this [area](#) .

One study published in [Alzheimer's Research and Therapy](#)  found that engaging in serious exergame-based training may have positive brain

changes for people with [mild cognitive impairment](#). These brain changes may be linked to cognitive improvements.

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Impact of exergame training on mild cognitive impairment

Mild cognitive impairment [can involve](#) struggles with memory, and may increase a person's chances of developing dementia.

Osteopathic physician specializing in neurology, [Amarish Dave](#), DO, who was not involved in the current study, explained to *Medical News Today* that mild neurocognitive disorder “refers to measurable decline in memory or thinking beyond normal aging, but daily independence is mostly preserved.”

“It is often a precursor to dementia, especially Alzheimer’s disease,” Dave noted.

The authors of the recent paper further explain that people with mild cognitive impairment experience brain changes, such as decreases in brain matter, that outpace what happens in typical aging. Acting quickly can help protect the brain and minimize cognitive decline.

The current research explored the impact of a specific intervention involving exergaming in people with mild cognitive impairment, focusing on brain changes and how these changes may link to cognitive improvements.

It was part of a larger randomized controlled trial that focused on how exergame training and breathing training affected cognitive performance.

This [trial](#) [📌] showed that, overall, the training helped to slow down cognitive decline and even led to cognitive improvements for about half the participants.

The current publication, a substudy, focuses on changes in the gray and white matter of participants' brains.

Brain changes and the possible link to cognitive improvements

The trial that the current analysis is based on included participants who had mild neurocognitive disorder but did not have other neurological disorders.

Researchers randomly assigned 41 participants to receive the intervention or to be part of the control group. A majority of participants, 87%, had biomarkers aligned with a cause of mild cognitive impairment, and most appeared to align with signs of Alzheimer's disease.

The intervention involved individualized exergame training as well as breathing training. The authors explain that it was multidomain, providing training for self-regulation and "physical, motor, and cognitive functions."

This intervention was in addition to the usual care that participants would receive. Researchers instructed these participants to train at least five times each week, with each session lasting at least 24 minutes. Outcome assessors did not know which participants were in the control group and which were in the intervention group.

Participants who were able received [MRIs](#) before and after the 12-week intervention. The current publication included participants with complete MRI data that researchers were able to evaluate. Researchers had complete information for 30 participants.

Among this subsample, the intervention group had improved cognitive performance, while in the control group, cognitive performance got worse.

The intervention group also had better outcomes for delayed and immediate verbal recall. When it came to gray and white brain matter volume, the intervention showed positive impact.

For example, the intervention appeared to have a positive impact on the gray matter volume of the hippocampus. The hippocampus typically atrophies in Alzheimer's disease. For white matter, there was a positive impact on the anterior cingulate cortex.

Researchers further found that the changes in gray matter volume in the left thalamus and the total hippocampus were weakly linked to participants' noted "improvements in verbal delayed recall."

Regarding white matter integrity, the intervention was possibly protective. White matter integrity, particularly in certain regions, was somewhat linked to cognitive improvement.

Dave noted the following about the study's findings:

“The trial showed that a tailored exergame program led to brain volume increases and improved white matter integrity. Although results are promising, the small sample size and exploratory design limit the power of the study.”

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Is there a causal link between exergaming and better cognition?

This study does have noted limitations. First of all, the original randomized control trial had limitations, such as the small sample size and short intervention time.

Additionally, only some of the training sessions happened under the supervision of a study investigator. However, the exergame system helped to monitor participants' progress as well.

The researchers who conducted the substudy acknowledged that the original trial “was not adequately powered for neuroimaging outcomes.” Thus, they encourage a cautious interpretation of the results.

The original study included participants with mild cognitive impairment from multiple causes. This, with the small sample size, was a challenge for the substudy. It is unclear if the effects apply to all types of mild cognitive impairment, or if the results are driven by a particular subtype.

Finally, while researchers looked at total brain volume, they also chose to focus their analysis on specific brain areas. Therefore, additional research may be needed.

The current publication can drive future research with larger sample sizes. More research is required to see if the observed changes in the brain are responsible for cognitive and word recall improvements and whether the changes may impact other functions. However, the authors believe that the observed associations suggest a causal link.

Overall, more extensive research can seek to understand the complex brain changes and how things are different for control versus intervention groups. Future research can also explore possible long-term effects and whether exergaming may help with dementia prevention.

Exergaming: An easier way to keep the brain in shape?

Overall, this research reinforces the potential benefits of the described training on the brain and cognitive performance.

[Vernon Williams](#), MD, a sports neurologist and founding director of the Center for Sports Neurology and Pain Medicine at Cedars-Sinai Orthopaedics in Los Angeles, who was not involved in the research, noted that: “Many people have concerns about their memory and worry about developing dementia. It is believed that the earlier we identify issues and intervene, the better the outcome will be.”

“The research indicates that exergame-based training is safe, has high attendance adherence, and can significantly improve global cognition, complex attention, and executive functions in those with various clinical conditions, including mild neurocognitive disorder [or mild cognitive impairment]. In addition, the intervention also shows promise in influencing brain structures affected by neurodegenerative conditions.”

– Vernon Williams, MD