

Video games might be better for balance rehab than conventional physical therapy

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Through a meta analysis of more than 100 studies, a team of Northeastern University researchers found that active video games like Wii Fit and Dance Dance Revolution are more effective than traditional physical therapy methods. Credit: Alyssa Stone/Northeastern University

Don't throw away that Wii Fit Balance Board—it might be more

valuable than you think. New research from a team at Northeastern University found that active video games—like Wii Fit and Dance Dance Revolution—are more effective for improving balance than conventional forms of physical therapy.

Led by Amy Lu, associate professor of communication studies at Northeastern, the team of researchers conducted a comprehensive review and meta analysis of thousands of studies focused on active video games. After narrowing their focus to a few hundred, they grouped the studies into different categories based on what they were measuring, from [physical fitness](#) to cognitive outcomes. The research on balance is just one of a series of papers the team has written based on their work.

"Personally speaking, I don't think active video games themselves can replace outdoor physical activities like soccer or basketball," Lu says. "It's a good alternative, however, in [this research], we have basically found that compared to those conventional treatments, active games actually work better."

Dagmar Sternad, university distinguished professor of biology at Northeastern who Lu recruited based on her expertise in balance, says, even looking conservatively, the findings indicate that "this automatized and supposedly more motivating and fun way of play and practice is at least as good as conventional training."

The findings are significant, especially in a field that can have lifesaving implications. Sternad says postural balance and falling are, even in healthy people, some of the "main risk factors that lead to immobility and then eventually mortality."

"Even for a 60-year-old woman falling with weak bones, if there is a fracture, the fracture confines her to be less mobile for three months," Sternad says. "Reduced mobility has an effect on overall health, and it's

a downward slope."

In studies conducted so far, researchers found that active video games mainly benefit healthy people without [medical conditions](#). Lu says it's indicative of how much more difficult balance work is for people with neurological conditions like multiple sclerosis, Parkinson's disease or cerebral palsy.

In looking at more than 100 studies, Lu and her team also found that active video game treatment had the greatest effect on children, followed by [older adults](#). Lu hopes these findings can send a signal to the games industry, which has historically not marketed or designed to older adults.

"They really liked it and could benefit a lot from it, so just imagine if we actually are going to be able to switch some of the focus of the population to older adults," Lu says. "Probably we're going to see a lot more public health benefits for this population."

As for why active video games are so effective, Lu says they are, by design, more engaging and motivating than conventional forms of physical therapy. The Wii Fit Balance Board is not too different from traditional balance boards that are used in physical therapy. But the way Nintendo has designed the experience to gamify physical activity—a physical action leads to feedback in the game that helps you achieve a goal both in the game and in real life—can make it more engaging.

"It's really giving you this kind of immediate pleasurable feedback in real time based on your input," Lu says. "Gamification and game companies have done a lot of research on how to make this reward feel very satisfactory. Then, on top of that, I also feel that in terms of the design of the devices, over the years from Wii to [Microsoft] Kinect to VR, one of the things I feel the companies have been dedicating

themselves to is to make this interactive process very effortless and smooth."

Sternad says the implications of these findings go beyond the games industry. She says the wider medical field could benefit from using active video games as another tool in the toolkit for physical therapy. In a field that is starting to explore physical distanced forms physical therapy, video games could be a boon for patients.

"Yes, you can provide [patients] with [assistive devices](#), you can provide people with physical therapy, but all of that has huge downsides," Sternad says. "Physical therapy is expensive. How do people get to the physical [therapy](#) office, if you think of more rural populations? You need a caregiver, a partner who drives you there."

"The opportunity such [active video games](#) [provide] to have some kind of fun way to practice at home, self-guided, is huge," she adds. "If doctors feel there is scientific support to tell them to do this—maybe even insurance paying for such platforms—that would be a step in a good direction."

The research is published in the journal *Archives of Physical Medicine and Rehabilitation*.

More information: Caio Victor Sousa et al, A Systematic Review and Meta-Analysis of the Effect of Active Video Games on Postural Balance, *Archives of Physical Medicine and Rehabilitation* (2023). [DOI: 10.1016/j.apmr.2023.01.002](https://doi.org/10.1016/j.apmr.2023.01.002)

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