Trial shows gamified at-home exercises can help prevent falls in older people

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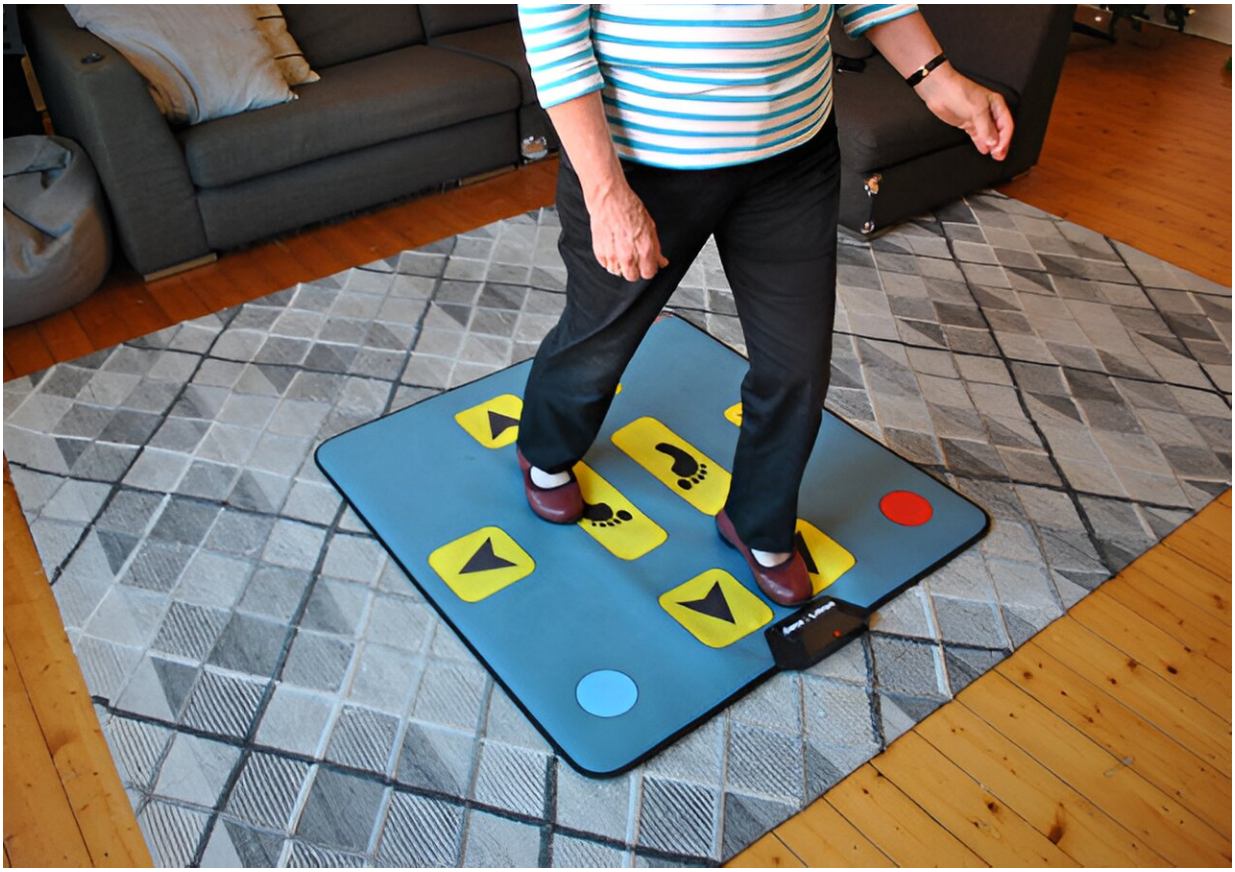

smart±step is connected to a television screen and once a game of choice is selected it requires the person to step on target panels on a step mat, just like one would with a game controller. Credit: NeuRA

A large randomized control trial conducted by a team of Neuroscience

Research Australia (NeuRA) and UNSW researchers found that at-home 'gamified' step exercises were effective at preventing falls in people over the age of 65, reducing the number of falls by 26% when compared to a control group.

The results of the trial, which was led by NeuRA, were published in *Nature Medicine*.

With a steadily aging population, the researchers say we need scalable and effective fall prevention strategies to address the growing impact of falls in the community.

"Regular balance-challenging exercise is effective at preventing falls, so we tried to make exercise fun and easy to do," says Dr. Daina Sturnieks, lead author of the study and Senior Research Scientist at NeuRA and UNSW Sydney.

"It was really encouraging to see that smart±step, an exercise gaming console that anyone can enjoy at home completely unassisted from a therapist, brought a benefit to older people by preventing falls."

A total of 769 people over 65—all living in the community—participated in Dr. Sturnieks' study. They were asked to do smart±step exercise games for 120 minutes per week over the course of 12 months. They reported their falls over this period and this data was compared to a control group, who only received a public health pamphlet about preventing falls.

Over the 12 month-study period, participants who received the exercise intervention showed significantly fewer falls compared to the control group: 36% of the exercise group had a fall in the study period, whereas 48.2% of the pamphlet group had a fall.

While these results are encouraging, the researchers said one limitation of the research was that the sample primarily consisted of well-educated and high functioning older people.

"The findings cannot be generalized to frailer older people," the researchers said.

"Furthermore, participants were not blinded to their intervention, therefore the level of expectancy for preventing falls may have differed between the groups, which may contribute to a placebo effect that might impact the findings."

Why gamified exercise for preventing falls?

One in three people over the age of 65 living independently will experience a fall every year. Falls are a significant public health issue, contributing to mobility-related disability and loss of independence, and they are the second leading cause of unintentional injury deaths worldwide.

The best evidence for fall prevention in the community is balance-challenging exercise, says Dr. Sturnieks.

"We've known for a long time that, if done correctly and consistently, balance-challenging exercises can prevent falls. But the problem is that often people don't keep up with their exercises because they can get boring very quickly," she says.

This led Dr. Sturnieks and the team at the Falls, Balance and Injury Research Center at NeuRA to explore the idea of gamifying the balance exercises.

"People get addicted to games because they are fun and they become

motivated to beat their high score and just get lost in the game," says Dr. Sturnieks.

smart±step is connected to a television screen and once a game of choice is selected it requires the person to step on target panels on a step mat, just like one would with a game controller.

Brain training added benefit

The advantages of smart±step exercise games—or exergames—go beyond physical exercise benefits: people are also undertaking cognitive training, which is easily incorporated into these games.

"These exergames require people to think quickly, unlike traditional exercise programs where you often just go through the movements," says Dr. Sturnieks. The smart±step exergames involve stepping on a mat, which acts as a controller.

The exergames vary in content and range from collecting treasures to stomping on moving cockroaches or avoiding obstacles. Overall, the games require timely movements and quick thinking to keep up.

"Exergames are like a two-in-one: you get physical benefits but also you are keeping yourself cognitively challenged, which is good for the brain and healthy aging. Plus, it's fun."

More information: Daina L. Sturnieks et al, Exergame and cognitive training for preventing falls in community-dwelling older people: a randomized controlled trial, *Nature Medicine* (2024). DOI: 10.1038/s41591-023-02739-0

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