

Study highlights role of physical, mental health in cognitive impairment

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Credit: Daniel Bernard

A recent study suggests that preserving physical and mental health helps older adults experiencing cognitive impairment stave off declines in cognitive engagement.

"We found that declines in physical and mental health were associated with more pronounced cognitive disengagement," says Shevaun Neupert, corresponding author of the study and a professor of psychology at North Carolina State University. "The impact of declines in [physical health](#) was particularly pronounced for study participants who had more advanced [cognitive impairment](#) to begin with."

There's a lot of research showing that cognitive engagement can help [older adults](#) maintain cognitive health. However, the vast majority of that work has been done on healthy adults.

"There's very little work on cognitive engagement in people who are already cognitively impaired, such as people who have been diagnosed with dementia," Neupert says. "Are they still capable of sustained cognitive engagement? What factors contribute to that engagement?"

To begin addressing those questions, the researchers enlisted 28 study participants. All of the participants were over 60 and had documented cognitive impairment. Participants came to a testing site two times, six months apart. On each visit, researchers collected data on the physical and mental health of the study participants and performed a battery of tests designed to assess cognitive ability. Participants were also connected to a device that tracked blood pressure continuously and then asked to engage in a series of increasingly difficult cognitive tasks. This allowed researchers to track how cognitive engagement changed as the tasks become progressively harder.

Cognitive engagement means taking part in activities that are mentally challenging. Monitoring blood pressure allows the researchers to track how hard study participants are working to accomplish cognitive tasks. Specifically, [blood pressure](#) rises as more blood is pumped to the brain when participants work harder at these tasks.

Broadly speaking, the researchers found that if a participant's cognitive ability, physical health or mental health declined over the course of the six month study period, that participant became less cognitively engaged as the tasks became harder.

"Normally, you'd expect more [engagement](#) as the tasks became harder, but we found that some people essentially stopped trying," says Claire Growney, co-author of the study and a postdoctoral researcher at Washington University in St. Louis.

"The findings highlight the fact that well-being is holistic; physical health, mental health and cognitive function can influence each other," says Xianghe Zhu, co-author of the paper and a recent Ph.D. graduate of NC State.

"In practical terms, it suggests that it may be particularly important for people to focus on mental and physical well-being during the early stages of

cognitive decline," Growney says. "Or, at the very least, don't become so focused on addressing cognitive challenges that you ignore physical [health](#) , or create anxiety or emotional distress for yourself that leads to [mental health](#) problems."

"Future research will be needed to determine how beneficial it might be for people to take part in cognitively engaging activities once they've started experiencing cognitive decline," Neupert says. "But we already know that there is an element of 'use it or lose it' to cognitive function in healthy adults. And while it's understandable for people to want to avoid tasks that are difficult or challenging, it's really important to continue challenging ourselves to take part in difficult cognitive activities."

The paper, "BFF: Bayesian, Fiducial, and Frequentist Analysis of Cognitive Engagement among Cognitively Impaired Older Adults," is published open access in the journal *Entropy*.

More information: Shevaun D. Neupert et al. BFF: Bayesian, Fiducial, and Frequentist Analysis of Cognitive Engagement among Cognitively Impaired Older Adults, *Entropy* (2021). [DOI: 10.3390/e23040428](#)

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