

Cognitive Activity Can Delay Alzheimer's for Years

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By Annie Lennon

BRIGHTON, England—Alzheimer's disease (AD) is a neurological disorder. In 2020, around 5.8 million in the United States were living with the condition, according to the Centers for Disease Control and Prevention (CDC).

Early symptoms include memory problems and confusion, while more-severe symptoms include an inability to communicate and seizures. There is no way to prevent, cure or stop the progression of AD.

Previous studies have found that cognitively stimulating activities, such as reading, have links with a lower risk of cognitive decline. Some say these activities delay the onset of cognitive symptoms related to AD by enhancing cognitive reserve—a reserve of thinking abilities, which is different between individuals, developed over the lifespan.

Scientists have noted this association between higher levels of cognitive activity and a lower risk for AD for some time. However, how strong the link is and the reasons behind it have remained unclear.

Recently, scientists from Rush University Medical Center in Chicago conducted a study investigating the relationship between levels of cognitive activity and age of AD onset, alongside a range of other factors.

"I was confident that higher cognitive activity would be associated with later age of dementia onset, but I was unsure of the size of the association," Dr. Robert Wilson, lead author of the paper, told *Medical News Today*.

"The study suggests that a cognitively active lifestyle can stave off the cognitive symptoms of Alzheimer's disease and related disorders by several years and thereby greatly reduce how much of one's lifespan is spent in a cognitively disabled state. We asked about everyday cognitively stimulating activities, such as reading a newspaper or book or visiting a library; it was cognitive activity in old age that was most protective," he continued.

The scientists published their study in *Neurology*.

Clinical examinations

The researchers examined data from 1,903 people with an average age of 79.7 years enrolled in the Rush Memory and Aging Project, a longitudinal study of aging and dementia.

None of the participants had a dementia diagnosis at the start of the study.

After enrollment, the participants responded to seven questions to assess their levels of cognitive activity. These included questions on how much time they spent reading each day, how often they wrote letters and how often they played games such as cards, checkers and puzzles.

The team also collected information on cognitive activity early on in life, loneliness and participation in social activities, including visiting friends or relatives.

Each participant further agreed to annual clinical evaluations, including medical-history assessment, neurological examination and a set of 19 cognitive tests, as well as a brain autopsy after death.

The team followed them for an average of nearly seven years. In all, the researchers autopsied 695 participant brains after death.

By the end of the study, 457 participants developed AD. They tended to be older at the beginning of the study and have slightly fewer years of education than other participants.

Those with the highest levels of cognitive activity in old age developed AD at an average age of 93.6 years. In contrast, those with the lowest levels of cognitive activity in old age developed the condition at 88.6 years.

The researchers conducted further analyses and found that levels of education, sex, early-life cognitive activity, genetic predisposition to AD, social activity and loneliness had little to no influence on the incidence of AD. This suggests that cognitive activity during old age is the most significant factor in developing the condition.

Making the brain more resilient

The researchers say that the mechanisms behind the link between cognitive activity and AD remain uncertain. Before finishing their study, they suspected that low levels of cognitive activity might be an early sign of AD.

So rather than a drop in cognitive activity increasing the risk of dementia, as the authors explain, "it is possible that a low level of cognitive activity is an early sign of underlying disease rather than a true risk factor."

However, when analyzing brain autopsies, they found that cognitive activity was not related to postmortem markers of AD.

The researchers say a more-likely explanation is that cognitively stimulating activities led to changes in brain structure and function that enhance cognitive reserve. Repeated engagement in these activities may enhance certain neural systems so that relatively more harm is needed before they stop working.

"You might say that the cognitive activity through life delays the symptoms but does not stop the underlying disease (pathology). In other words, the activity gives you a reserve that makes you resilient to the presence of the Alzheimer's pathology in the brain, enabling you to function better for longer,"

James Rowe, professor of cognitive neurology at the University of Cambridge, United Kingdom, who was not involved in the study, told *MNT*.

The scientists conclude that a cognitively active lifestyle in old age may delay the onset of AD by five years.

A major limitation of the research is that the team conducted the study on a selected group of mainly white, well-educated participants. The scientists suggest that future research should investigate whether the findings also apply to more-diverse groups of people with a wider range of cognitive experiences.

"Growing evidence is suggesting cognitive engagement may be a modifiable risk factor for dementia," Claire Sexton, D.Phil., director of scientific programs and outreach at the Alzheimer's Association, told *MNT*. "And this study adds to the literature by indicating that keeping the brain active with challenging activities may delay the age at which dementia develops."

She noted that "further interventional studies are needed in diverse populations that account for varying levels of education. This work is already happening—cognitive stimulation is one of the interventions that will be studied as part of the Alzheimer's Association's U.S. POINTER clinical trial.

"[The researchers] show that, although cognitive activity does not change the presence or severity of the brain changes of Alzheimer's, your brain manages better to cope with the pathology. The consequence is that your functional decline—i.e., memory loss to a severity that interferes with everyday life—is delayed," explains Professor Rowe.

He added: "They show clearly that cognitive activity is good for you and your well-being in later life, and that is an important message to get out. It is not about what to do after you get memory symptoms or dementia but how to prevent the dementia by being active earlier in life—part of a bigger shift away from merely treating dementia to looking after brain health."