

Study shows adequate sleep may help prevent dementia for African Americans with genetic risk factor

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Could something as basic as a good night's sleep protect African Americans who have a gene variant linked to Alzheimer's Disease?

A new study in the *Journal of Alzheimer's Disease* by neuroscientists at the Center for Molecular and Behavioral Neuroscience (CMBN) at Rutgers University-Newark points to this possibility for carriers of a

variation that is the most common genetic risk factor for African Americans who suffer from Alzheimer's at twice the rate of white people.

"This new finding suggests that someone with a high-risk variant might be able to overcome their genetic inheritance by improving their [sleep habits](#)," said Bernadette Fausto, Research Faculty at CMBN, who is the lead author on this new study.

In addition to being at greater risk of Alzheimer's disease, African Americans get less sleep on average, according to Fausto. The National Health Interview Survey found a "sleep gap" of nearly an hour, with white women getting the most sleep and Black men the least.

For African Americans who live in cities, population density translates into more night-time noise. There is more traffic, with trucks and ambulances disturbing the quiet, and more light pollution, which impacts the body's ability to release melatonin, Fausto noted.

African Americans are also more likely to have severe cases of sleep apnea than white people, according to a study in the *Journal of Clinical Sleep Medicine*.

"There's a growing awareness that sleep is crucial for [brain health](#) and this may be a significant contributor to the high rates of Alzheimer's disease and other dementias among African Americans," said Mark A. Gluck, senior author on the new paper, who is a Professor of Neuroscience and Public Health and director of Rutgers University Newark's Aging & Brain Health Alliance. "Sleep disruption of any sort can accelerate the progression of Alzheimers," he added.

Scientists have long known about the connection between poor sleep and Alzheimer's disease, as well as the association with the high-risk ABCA7

variant and the disease.

The Rutgers researchers explored the obvious next step, asking whether there is an interplay between those two factors.

They enrolled 114 cognitively healthy African Americans from in and around Newark, separating them into two groups: Those with the high-risk version of the ABCA7 gene and those with a lower-risk variant. All of them were given a battery of cognition tests.

In addition, the study participants were asked to complete a simple self-assessment of their sleep quality. When researchers crunched the numbers, here's what they found: People with the risky genotype who reported getting enough quality sleep were protected from developing one of the earliest cognitive signs of Alzheimer's disease, the inability to apply, or generalize, previous learning to a new problem. In contrast, those with the high-risk gene variant who reported poor quality sleep showed impairments in generalization of previous learning.

"The findings were striking," Fausto said. "We were shocked when we first saw it."

We think of sleep as a time when we aren't doing things—aren't awake, aren't eating, aren't walking, aren't talking. Yet it is a busy time for the whole body, especially the brain, which uses this downtime to undertake basic maintenance tasks.

"Every cell is like a home—it generates garbage. This only becomes a problem if that garbage doesn't get picked up," Gluck said. In the case of the brain, that collection of "toxic garbage" takes place during the specific type of sleep that occurs in the pre-dawn hours. If sleep is truncated or disturbed, toxins can accumulate in the brain.

"We spend about a third of our life sleeping or trying to sleep, so that's a pretty significant amount of our lives that's easy to overlook," Fausto said.

Gluck and Fausto hope the next step will be having participants wear a lightweight headset while they sleep that monitors and records brain waves down to the millisecond. This will help determine which specific types of brain waves are associated with better cognition. It will also eliminate any errors that might have crept into the research from people who might have mischaracterized or misremembered the quality of their sleep.

"In many areas of medicine we are seeing the growth of what is known as 'personalized medicine' in which the treatments for a disorder are determined, in part, by a patient's genetic profile," says Gluck.

Down the road, Gluck envisions a time when a doctor, upon discovering someone has the ABCA7 risk factor, will not tell the patient that they need some expensive new drug but rather: "You really, really need to improve the quality of your sleep."

More information: Neha Sinha et al, High-Quality Sleep Mitigates ABCA7-Related Generalization Deficits in Healthy Older African Americans, *Journal of Alzheimer's Disease* (2023). [DOI: 10.3233/JAD-230043](https://doi.org/10.3233/JAD-230043)

Provided by Rutgers University

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