Resilience Index Gives Clinicians a New Tool to Assess Brain Health

Researchers at the University of Miami’s Miller School of Medicine have developed a resilience index, which rapidly assesses diet, physical and cognitive activities, social engagement, mindfulness and cognitive reserves to quantify brain health.

James E. Galvin, M.D., M.P.H.

In a study published December 7, in the Journal of Alzheimer’s Disease, the Comprehensive Center for Brain Health team showed the index accurately predicts brain resilience and can inform care plans tailored to each patient’s unique cognitive needs.

“There haven’t been any good methods to measure how healthy your brain is. We are much better at measuring how sick it
is,” said James E. Galvin, M.D., M.P.H., professor of neurology, director of the Comprehensive Center for Brain Health, and first author of the paper, “The Resilience Index: A Quantifiable Measure of Brain Health and Risk of Cognitive Impairment and Dementia.”

“A higher score on the resilience index means your brain is healthier – you have less risk of developing Alzheimer’s or other types of dementia,” said Dr. Galvin. “A lower score means you are at higher risk and could benefit from targeted interventions.”

Around 60% of the factors contributing to Alzheimer’s disease, including age and genetics, are hardwired into our biology. To create the index, the researchers focused on the modifiable 40%. By assessing these factors, clinicians can make actionable suggestions with high potential to improve brain health.

Each of the six factors associated with resilience was carefully researched to provide the most accurate and compelling information. For example, the cognitive reserve scale is weighted more towards occupation than educational achievement, as how people use their brains likely factor more into disease resistance than how many years of school they attended.

“Someone might have a Ph.D. in astrophysics but spend most of their days playing video games,” said Dr. Galvin. “They may have a tremendous education, but they’re really not doing anything for their brain, whereas someone with a high school diploma might start and direct a multinational corporation.”
To determine the index’s accuracy, the team studied 75 patients with mild cognitive impairment (MCI), 127 with Alzheimer’s disease and related dementia and 39 cognitively normal controls. They found a strong correlation between resilience index results and clinical measures, such as ApoE, a gene associated with increased risk of Alzheimer’s, and volumetric MRIs, which assess neurodegeneration.

In addition, group analyses demonstrated that controls with higher resilience index scores had better cognitive performance than controls with lower resilience index scores. The same was true for the MCI and dementia groups.

“We found the people who scored higher for resilience on the index had healthier brains than the people who scored lower,” said Dr. Galvin. “And what's really nice is that patients only need around ten minutes to fill out these surveys, and we get so much actionable information. I can make good predictions about brain health, before we even do any clinical diagnostics and start thinking about the kinds of interventions I should suggest for that patient.”

The index will give neurologists a robust tool to assess patients and possibly prevent, or at least mitigate, cognitive decline. Information about diet, mindfulness and the other measures will help pinpoint specific adjustments that can help people reduce their cognitive risks. In addition, the index has great potential to advance fundamental neurological research.

“Part of the project going forward,” said Dr. Galvin, “is to apply this to look for biomarkers and other molecular signals, so we can better understand the relationships between a
person’s biology, their lifestyle and environment and their resilience.”

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