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Super-aging: Defining exceptional cognitive ability in late-life

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Research led by UNSW Sydney's Center for Healthy Brain Aging (CHeBA) has highlighted the need for clarity when defining late-life cognitively high performers, which could ultimately inform strategies to

help prevent the development of dementia.

Super-aging refers to the elite group of individuals who manage to maintain varying degrees of midlife levels of capability and activity into very late life. A "cognitive super-ager" is deemed to demonstrate higher levels of intellectual activity than their more cognitively average peers.

Super-agers have been shown to have healthier lifestyles, less diabetes, and, from a genetic standpoint, have lower rates of the protein associated with Alzheimer's disease. Imaging studies of the brains of super-agers also show less brain atrophy, greater white matter integrity and differences in functional connectivity.

However, how super-aging is best defined and how exactly it differs from usual or normal aging remain unanswered.

Currently, there isn't a consistent approach to measuring cognitive super-aging. Most studies consider super-aging based on memory performance that is equivalent or comparable to that of a younger adult range, but very few examine other aspects of cognition or the maintenance of high-level abilities over time.

The review, published in the *International Journal of Geriatric Psychiatry*, comprises a systematic literature search of 44 studies across five major research databases from their inception until July 2023. It aimed to evaluate the literature identifying older adults with exceptional cognitive performance with emphasis on how super-aging is defined, and the key clinical features that distinguish this group from the general older adult population.

A major goal of aging research is to identify factors associated with a delay in the emergence of age-related disease and a lower burden of disease to promote healthy life expectancy.

Differences in definitions of super-aging across the research were extensive and included variations in the ages of the super-aging groups and comparator groups, cognitive domains and neuropsychological tests being used as well as the cut-off scores.

The review showed that maintenance of cognitive abilities over time was inconsistently required and there was a limited focus on superior cognitive performance in domains other than verbal memory.

"Understanding and identifying exceptional cognition is extremely powerful for research," said lead author Dr. Alice Powell. "It would allow us to increase the value of research insights gained from studying this extraordinary population—both in terms of aging well and preventing and treating neurodegenerative conditions such as Alzheimer's disease."

However, major discrepancies in these approaches such as the age range of super-agers and comparator groups and the choice of cognitive domains assessed need to be addressed to reach consensus in the field.

Dr. Powell said a future approach could be to apply different criteria to identify groups of super-agers from a large population sample. Examination of how cognitive super-aging relates to physical capacity, psychological well-being and degree of social engagement may also provide greater insights into aging well.

More information: Alice Powell et al, Defining exceptional cognition in older adults: A systematic review of cognitive super-ageing, *International Journal of Geriatric Psychiatry* (2023). DOI: 10.1002/gps.6034