

Higher BMI in adolescence may affect cognitive function in midlife

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This is an image of a weight scale. Credit: CDC/Debora Cartagena

Overweight and obesity in adolescents have increased substantially in recent decades, and today affect a third of the adolescent population in some developed countries. While the dangers posed by high adult BMI on cognitive function in later life have been documented, the association of adolescent BMI with cognitive function in midlife has not yet been reported. (BMI, or Body Mass Index, is a calculation of a person's weight

in kilograms divided by the square of their height in meters.)

To shed light on this issue, scientists at the Hebrew University-Hadassah Braun School of Public Health and Community Medicine set out to determine the association between cumulative life course burden of high-ranked [body mass index](#) (BMI), and cognitive function in midlife. The research, which will appear in the *Journal of Alzheimer's Disease* 55, was led by Prof. Jeremy Kark from the Braun School, in the Hebrew University of Jerusalem's Faculty of Medicine, working with colleagues in Israel and the United States.

The researchers used weight and height data from 507 individuals tracked from over 33 years starting at age 17. The participants completed a computerized cognitive assessment at ages 48–52, and their [socioeconomic position](#) was assessed by multiple methods. Using mixed models the researchers calculated the life-course burden of BMI from age 17 to midlife, and used multiple regression to assess associations of BMI and height with global cognition and its five component domains.

"In this population-based study of a Jerusalem cohort, followed longitudinally from adolescence for over 33 years, we found that higher BMI in late adolescence and the long-term cumulative burden of BMI predicted poorer cognitive function later in life. Importantly, this study shows that an impact of obesity on cognitive function in midlife may already begin in adolescence, independently of changes in BMI over the adult life course," said the paper's senior author, Prof. Jeremy Kark of the Hebrew University-Hadassah Braun School of Public Health and Community Medicine.

"Our results also show that taller stature was associated with better global cognitive function, independent of childhood and adult socioeconomic position, and that height increase in late adolescence, reflecting late growth, conferred a protective effect, but among women only," added

Irit Cohen-Manheim, doctoral candidate at the Braun School and lead author.

The researchers point out that while socioeconomic position may have a particularly important role in the trajectory of a person's lifetime cognitive function, it has rarely been adequately taken into account: "To the best of our knowledge, the association between BMI and cognition as a function of childhood and adult socioeconomic position has not been previously reported. Childhood household socioeconomic position appears to strongly modify the association between adolescent BMI and poorer cognition in midlife, the inverse association being restricted to low childhood socioeconomic position," said Prof. Kark.

"Our results are consistent with the hypothesis that childhood living conditions, as reflected also by height, influence cognitive function later in life; however, our study is unique in showing that an adverse association of higher BMI with cognitive function appears to begin in adolescence and that it appears to be restricted to adults with lower childhood socioeconomic position," said Prof. Kark.

"Evidence for the association between impaired cognitive function in midlife and subsequent dementia supports the clinical relevance of our results. Findings of the relation of BMI in adolescence with poorer midlife cognitive status, particularly in light of the ongoing epidemic of childhood obesity, require confirmation," said Irit Cohen-Manheim.

More information: Irit Cohen-Manheim et al. Body Mass Index, Height, and Socioeconomic Position in Adolescence, Their Trajectories into Adulthood, and Cognitive Function in Midlife, *Journal of Alzheimer's Disease* (2016). [DOI: 10.3233/JAD-160843](https://doi.org/10.3233/JAD-160843)

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