

Could one prenatal vitamin reshape how your child remembers words, patterns and places?

May 25 2026, by Sanjukta Mondal



High-dose vitamin D3 supplementation during pregnancy was linked with better verbal and visual memory. Credit: Aknarin Thika for Pexels

Prenatal supplements nourish both mother and baby, helping fill vitamin and mineral deficiencies in the mother while supporting a healthy

pregnancy and strong fetal development throughout every stage of pregnancy. Scientists have now found that a little extra vitamin D supplement goes a long way in improving the child's ability to learn new words and remember patterns and locations.

A [randomized clinical trial](#) conducted in Denmark involving 623 mother-child pairs found that women who took a high dose of vitamin D3, 2,800 IU per day, compared to the standard dose of 400 IU per day, had children who performed better at visual and verbal memory tests at age 10.

The study, however, did not identify a clear threshold for maternal vitamin D levels beyond which significant improvements in children's developmental outcomes were observed.

The findings are published in *JAMA Network Open*.

Sunshine vitamin for brighter brain

Modern indoor lifestyles, geographic location, air pollution that blocks sunlight, and several other factors have contributed to a rising trend in vitamin D deficiency across large sections of the population. This trend could significantly add to the [global burden of disease](#).

Crucial for overall well-being, vitamin D supports strong bones by helping the body absorb calcium, it maintains a healthy immune system, proper muscle and nerve function, and several other important bodily functions. During [pregnancy](#), it also plays a critical role in brain development.

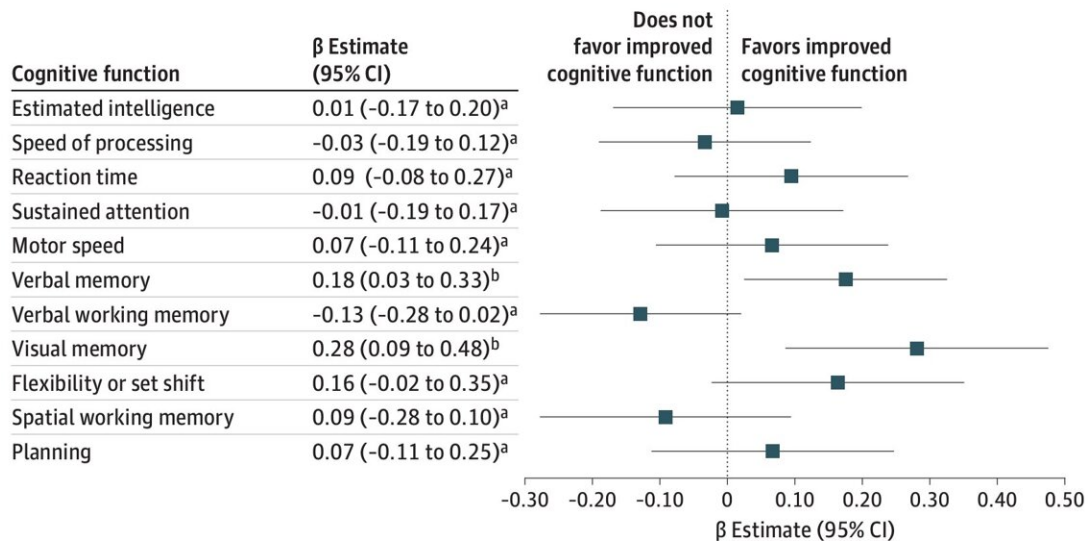
Could vitamin D during pregnancy shape how a child's brain develops years later? Some animal and human studies suggest that vitamin D during pregnancy could shape a child's brain development and future

mental health. However, no clinical trial had tested this.

In this study, they recruited 700 mother-child pairs but excluded women who were already taking a lot of vitamin D or who had other health issues like heart or kidney disease. The women were then randomly divided into two groups.

One received the standard daily dose of 400 IU of vitamin D3, while the other received a much higher dose of 2,800 IU per day. They took the supplements from the 24th week of pregnancy until a week after giving birth. The children were [followed until they reached 10 years](#), then asked to come back for follow-up—498 of them came in for a two-day checkup.

On day one, the children spent two hours on brain games and puzzles targeting 11 cognitive functions—memory, IQ, and attention among them. The next day, the team took MRI scans to take a closer look at their brain structure.



Forest plot of association between high-dose vs standard-dose vitamin D₃ supplementation during pregnancy and cognitive functions at age 10 years. Credit: *JAMA Network Open* (2026). DOI: 10.1001/jamanetworkopen.2026.11464

The tests revealed that children whose mothers took high doses of vitamin D₃ during the second half of pregnancy performed better on specific verbal memory tests—remembering words and language-based information—as well as visual memory tests—patterns and locations—compared to those whose mothers received the standard dose. However, extra vitamin D did not affect [overall IQ](#), attention, or reaction speed.

The randomized controlled trial adds to the existing evidence on the association between prenatal vitamin D exposure and childhood cognition. The findings could help shape recommendations for prenatal nutrition and pregnancy care, especially for populations at higher risk of vitamin D deficiency.

More information: Olivia Frigast Frederiksen et al, High-Dose Vitamin D₃ Supplementation During Pregnancy and Test-Based Cognitive Performance at Age 10 Years, *JAMA Network Open* (2026). DOI: [10.1001/jamanetworkopen.2026.11464](https://doi.org/10.1001/jamanetworkopen.2026.11464)

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