

# Evaluation of dietary intake in children and college students with and without attention-deficit/hyperactivity disorder.

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## Abstract

### OBJECTIVES:

To evaluate dietary intake among individuals with and without attention-deficit hyperactivity disorder (ADHD), to evaluate the likelihood that those with ADHD have inadequate intakes.

### METHODS:

Children, 7-12 years old, with ( $n = 23$ ) and without ( $n = 22$ ) ADHD, and college students, 18-25 years old, with ( $n = 21$ ) and without ( $n = 30$ ) ADHD comprised the samples. Children's dietary intake was assessed by a registered dietitian using 24-hour recalls over 3 days. College students kept a detailed food record over three days. Dietary information for both groups was entered into the Nutrition Data Systems for Research database, and output was analyzed using SAS 9.4. Nutrient analyses included the Healthy Eating Index-2010, Micronutrient Index (as a measure of overall micronutrient intake), and individual amino acids necessary for neurotransmission. Logistic regression was used to model the association of nutrient intake with ADHD. Models were adjusted for age, sex, IQ (or GPA), and energy intake (or total protein intake) as appropriate. Significance was evaluated at  $P = 0.05$ , and using the Benjamini-Hochberg corrected P-value for multiple comparisons.

### RESULTS:

No evidence existed for reduced nutrient intake among those with ADHD compared to controls in either age group. Across both groups, inadequate intakes of vitamin D and potassium were reported in 95% of participants. Children largely met nutrient intake guidelines, while college students failed to meet these guidelines for nine nutrients. In regards to amino acid intake in children, an increased likelihood of having ADHD was associated with higher consumption of aspartate,  $OR = 12.61$  ( $P = 0.01$ ) and glycine  $OR = 11.60$  ( $P = 0.05$ ); and a reduced likelihood of ADHD with higher intakes of glutamate,  $OR = 0.34$  ( $P = 0.03$ ). Among young adults, none of the amino acids were significantly associated with ADHD, though glycine and tryptophan approached significance.

### DISCUSSION:

Results fail to support the hypothesis that ADHD is driven solely by dietary micronutrient inadequacy. However, amino acids associated with neurotransmission, specifically those affecting glutamatergic neurotransmission, differed by ADHD status in children. Amino acids did not reliably vary among college students. Future larger scale studies are needed to further examine whether or not dietary intake of amino acids may be a modulating factor in ADHD.