Breakfast enhances cognition in children and adolescents

But evidence not yet clear on the effects of specific foods

by Pippa Wysong
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There is an adage that breakfast is the most important meal of the day, yet 20% to 30% of children and adolescents, for various reasons, miss breakfast. This can affect cognitive and academic performance. A systematic review by researchers from the UK confirms breakfast is indeed important for cognitive performance, but they report that the jury is still out as to exactly which foods give students the best boost for their brain.

Dr. Katie Adolphus and colleagues from the Human Appetite Research Unit at the School of Psychology at the University of Leeds conducted a review of studies in the medical literature to determine what the evidence is when it comes to breakfast and cognition in children and adolescents. The study was published in the journal Advances in Nutrition.

The review highlights the cognitive domains that are potentially more sensitive to the effects of eating breakfast. A total of 45 studies were included, most of which investigated the effect of a single breakfast on cognition over a short period of time (an ‘acute’ effect) within about four hours of eating. Close to half the studies compared students who had breakfast to those who had no breakfast, while some compared cognitive measures in students by the type of breakfast they ate.

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Studies were included in the review if they were published in peer-reviewed journals; included children or adolescents (aged 4 to 18 years); compared the effects of breakfast compared to no breakfast or different breakfast types or sizes; included objectively measured cognitive performance; and examined acute effects (temporary effects occurring shortly after breakfast consumption), and/or chronic effects (effects occurring after the repeated consumption of breakfast over time).

“Overall, we found that breakfast consumption, relative to fasting, has short-term positive domain-specific effects on cognition. Its effect is especially notable in tasks that require attention, executive function, and memory. These are all facilitated more reliably by breakfast consumption when compared to fasting, with effects more apparent in undernourished children,” Dr. Adolphus said.

However, generalizations about which foods are the most helpful for short-term cognitive performance cannot be made, largely because there are too few quality studies specifically
comparing breakfast food types, she said. But in studies which compared breakfast type on short-term cognitive performance, a limited number suggested a low-Glycemic Index breakfast tended to be associated with positive effects on attention.

**Why breakfast helps the brain**

But what makes breakfast so important for children and adolescents? For one, children have a higher brain glucose metabolism than adults, and so need more “fuel” to feed their brains. Plus, children and adolescents need more sleep which means they have longer overnight fasting periods which can deplete glycogen stores overnight.

“In order to maintain this higher metabolic rate, a continuous supply of energy derived from glucose is needed. Hence breakfast consumption may be vital to providing adequate energy for the morning,” she said.

In addition, evidence suggests breakfast consumption is associated with improved subjective feelings of mood and alertness in school children. This means the positive changes in mood, alertness, and motivation after eating breakfast may in turn help cognitive performance by increasing one’s ability to concentrate to perform cognitive tasks. It can influence motivation, too.

We conclude that breakfast is better than skipping breakfast in terms of acute effects on cognition. We just don’t know what type of breakfast in terms of composition is best for cognition from the evidence,” Dr. Adolphus said.

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