

Overweight Kids Who Exercise Improve Thinking, Math Skills: Study

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Chronic sedentary behavior 'is compromising children's ability and achievement,' research suggests



When overweight, sedentary kids start to exercise regularly, their ability to think, to plan and even to do math improves, a new study suggests. In addition, exercise was linked to increased activity in the parts of the brain associated with complex thinking and self-control, according to brain imaging scans analyzed by the researchers. "This implies that chronic sedentary behavior is compromising children's ability and achievement," said lead researcher Catherine Davis, a clinical health psychologist at the Georgia Prevention Institute at Georgia Health Sciences University in Augusta. "We know that exercise is good for you, but we didn't have very good evidence [before this] that it would help children do better in school," said Davis.

Although this study was done among overweight children, she believes that similar results would be seen in normal-weight kids. Davis speculates that these positive changes are a result of a combination of biological and environmental factors. "There are some neural growth factors that have been identified in mice that exercise," she said. These benefits may include more brain cells and more connections between them. But there are also social and environmental factors, she noted. "[There's] more stimulation when things are moving faster and when you're moving. So it is cognitively stimulating to move," Davis said.

With one-third of U.S. children overweight, Davis thinks that exercise needs to become an essential part of children's lives. "Make sure your child has a balanced life -- not only that they study, but that they learn to take care of their bodies as well," she said.

The report is published in the January issue of *Health Psychology*. For the study, Davis's team randomly assigned 171 overweight children 7 to 11 years old, to either 20 minutes or 40 minutes of vigorous exercise every day after school or to no exercise. The exercise program focused on fun and safety rather than competition and skill, and included running games, hula hoops and jump ropes. Researchers found it raised their heart rates to 79 percent of maximum, which is considered vigorous.

The researchers evaluated the children using standard achievement tests known as the Cognitive Assessment System and Woodcock-Johnson Tests of Achievement III. Some children also had magnetic resonance imaging (MRI) scans of their brains. **The MRIs found that children who exercised had increased activity in the so-called executive function area of the brain -- associated with self-control, planning, reasoning and abstract thought -- as well as the prefrontal cortex. The latter is the part of the brain linked with complex thinking and correct social behavior, the researchers noted.**

There was also decreased activity in an area of the brain that's behind the prefrontal cortex. The shift seems to be tied to faster developing of cognitive skills, Davis said. In addition, the more the kids exercised, the more the intelligence-test scores went up.

An average increase of 3.8 points on scores in cognitive planning skills was noted in kids who exercised 40 minutes a day for three months, the researchers found. Children who exercised 20 minutes a day experienced smaller gains. There were also improvements in math skills, but not reading ability. "The finding of improved math achievement is remarkable, given that no academic instruction was provided, and suggests that a longer intervention period may result in more benefit," the researchers said.

Commenting on the study, Samantha Heller, a dietitian, nutritionist and exercise physiologist, said: "Take a bunch of kids, put them outside, give them some balls, jump ropes and street chalk, and they will be running, jumping and playing hopscotch in no time." They become happier, more energetic, smarter kids, she said. "Children's bodies know intuitively that exercise is essential for healthy brain and body function. But when we deny children their natural instincts and allow them to stultify in front of a TV or computer, they become lethargic [and] moody," Heller said, adding that sedentary kids are also prone to being overweight and may do poorly in school.

"It seems a no-brainer to me that for kids' brains to be healthy, they should be encouraged to participate in regular exercise and given the time and place for it," Heller concluded. "We need to turn off the computers, TVs, cell phones and iPads and let kids do what they do naturally: Run around and play."

More information

- For more information on kids and exercise, visit the [Nemours Foundation](#).

SOURCES: Catherine Davis, Ph.D., clinical health psychologist, Georgia Prevention Institute, Georgia Health Sciences University, Augusta; Samantha Heller, M.S., R.D., dietitian, nutritionist, exercise physiologist, Fairfield, Conn.; January 2011, *Health Psychology*
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