

**New York State Department of Health**  
**Summary of Research on Obesity, Physical Activity, Physical Education and Nutrition on Academic Outcomes in School Children**

Independent bodies of research have considered the contribution of weight status (i.e., obesity, Body-Mass Index), physical activity/fitness and nutrition to academic performance in children and adolescents. The most well developed research concerns associations between physical activity, fitness and indicators of academic performance. Student fitness has been demonstrated to be predictive of better academic performance and improved concentration, memory and classroom behavior. Adding physical activity into the classroom has been shown to improve students' ability to stay on task.

With regard to nutrition and diet, the most consistent findings are those showing a positive association between breakfast consumption and improved cognitive function, academic achievement and school attendance. Consumption of fewer sugar sweetened beverages, increased milk consumption, increased intake of vitamins and minerals, have also been linked to higher better academic performance. The quality of the studies demonstrating these associations vary considerably.

Several studies have demonstrated a correlation between obesity and academic outcomes. However, the vast majority of these studies show the observed associations between obesity and poorer academic outcomes are no longer apparent after taking account of differences in socio-economic status, fitness and diet among obese and non-obese students. An annotated summary of key references and review papers follows.

## **Nutrition and Academic Performance (Selected References)**

Edwards J U; Mauch L; Winkelman MR. Relationship of nutrition and physical activity behaviors and fitness measures to academic performance for sixth graders in a midwest city school district. *J of School Health* 2011; 81(2) 65-73.

- Sixth grade students who consumed more milk, and less fruit juice and sugary drinks had higher measures of academic progress than sixth graders who had poorer diets.

Asbridge M; Florence MD; Veugelers PJ. Diet quality and academic performance. *J of School Health* 2008; 78(4) 209-215.

- Fifth grade students who ate a wider variety of foods and had better dietary adequacy had better academic performance. Fruit and vegetable consumption and dietary fat intake, in particular, were demonstrated as important to academic performance.

Taras H. Nutrition and student performance at school. *J of School Health* 2005 75(6) 199-213.

- A review of articles on nutrition and school performance found two factors fairly consistently related to school performance: serious iron deficiency and breakfast consumption. The first decreased achievements and the latter improved achievements.

Li Y; Dai Q; Jackson J; Zhang J. Overweight Is Associated With Decreased Cognitive Functioning Among School-age Children and Adolescents. *Obesity* 2008; 16(8) 1809–1815.

- Increased body weight was independently associated with decreased visuospatial organization and general mental ability among children.

Hoyland A; Dye L; Lawton CL. A systematic review of the effect of breakfast on the cognitive performance of children and adolescents. *Nutr Res Rev.* 2009; 22(2):220-43.

- Breakfast consumption is more beneficial than skipping breakfast for greater academic achievement; this effect is more apparent in children whose nutritional status is compromised.

Rampersaud GC; Pereira MA; Girard BL; Adams J; Metz J. Breakfast habits, nutritional status, body weight, and academic performance in children and adolescents. *J Am Diet Assoc.* 2005; 105(5):743-60.

- A review of 22 studies examining the association of breakfast consumption academic performance in children and adolescents suggest that children who eat breakfast consistently may have higher cognitive function related to memory, test grades, and school attendance.

## School-Based Physical Activity, including Physical Education, and Academic Performance (Selected References)

Centers for Disease Control and Prevention. *The association between school-based physical activity, including physical education, and academic performance*. Atlanta, GA: U.S. Department of Health and Human Services; 2010.

- Across all 50 studies (reported in 43 articles), there were a total of 251 associations between physical activity and academic performance, representing measures of academic achievement, academic behavior, and cognitive skills and attitudes. Strong evidence suggests that children who participate in daily physical education exhibit better school attendance, a more positive attitude to school, stronger academic achievement, increased concentration, improved math, reading, and writing test scores, and reduced disruptive behavior. Eight of nine studies found positive associations between classroom-based physical activity and indicators of cognitive skills and attitudes, academic behavior, and academic achievement; none of the studies found negative associations.

Soyeon A, Fedewa AL. The effects of physical activity and physical fitness on children's achievement and cognitive outcomes: a meta-analysis. *Research Quarterly for Exercise and Sport*. 2011; 82(3): 521-535.

- A comprehensive, quantitative synthesis of the literature, using a total of 59 studies from 1947 to 2009 for analysis found a significant and positive effect of physical activity on children's achievement and cognitive outcomes, with aerobic exercise having the greatest effect.

Singh A, Uijtdewilligen L, Twisk JR, van Mechelen W, Chinapaw MM. Physical activity and performance at school: A systematic review of the literature including a methodological quality assessment. *Arch Pediatr Adolesc Med*. 2012; 166(1): 49-55.

- A comprehensive review of prospective studies between 1990 and 2010 found that participation in physical activity is positively related to academic performance in children. There was evidence of a significant longitudinal positive relationship between physical activity and academic performance.

Basch, CE. Healthier students are better learners: A missing link in school reforms to close the achievement gap. *Equity Matters: Research Review No.6*; New York: Teachers College, Columbia University; 2010.

- School administrators, trying to raise standardized test scores, may mistakenly believe that physical education curricular time should be sacrificed and reallocated to reading, mathematics, and science. There is currently no evidence indicating that this strategy is, in fact, effective in increasing standardized test scores.

Trost, SG. Active Education: Physical Education, Physical Activity and Academic Performance. *Active Living Research*. San Diego, CA; 2009.

- Studies consistently show that more time in physical education and other school-based physical activity does not adversely affect academic performance. In some cases, more time in physical education leads to improved grades and standardized test scores. Physically

active and fit children tend to have better academic achievement. Evidence links higher levels of physical fitness with better school attendance and fewer disciplinary problems.

National Association for Sport and Physical Education. *Reducing school physical education programs is counter-productive to student health and learning and to our nation's economic health*. Reston, VA; 2010.

- Students who are fit and healthy are more ready to learn. Physical education is a critical contributor to physical fitness, health and academic performance.

Centers for Disease Control and Prevention. *Physical inactivity and unhealthy eating behaviors and academic achievement*. Atlanta, GA: U.S. Department of Health and Human Services; 2009

- Data from the 2009 National Youth Risk Behavior Survey (YRBS) show a negative association between physical inactivity and unhealthy dietary behaviors and academic achievement after controlling for sex, race/ethnicity, and grade level.