



The Role of Sound Nutrition and Physical Activity in Academic Achievement

Factors related to overweight in schoolchildren negatively influence a child's readiness to learn and overall achievement. Poor nutrition and lack of physical activity are not only root causes of overweight and obesity, they are also factors associated with lower academic achievement. Studies demonstrate that when children's basic nutritional and fitness needs are met, they attain higher achievement levels. Schools have a critical role in helping students learn and practice healthy eating habits, and in providing the knowledge, motivation, and skills children need for lifelong physical activity [1].

Poor nutrition hampers academic achievement.

Recent studies demonstrate:

- In a New York study, many students experienced malnutrition that was too slight for clinical signs yet still affected their intelligence and academic performance. This impairment can be corrected through improved nutrition [2], [3].
- Among fourth grade students, those having the *lowest amount of protein* in their diet had the *lowest achievement scores* [4].
- *Iron deficiency anemia* leads to *shortened attention span, irritability, fatigue, and difficulty with concentration*. Consequently, anemic children tend to do poorly on vocabulary, reading, and other tests [5].
- Children who suffer from *poor nutrition* during the brain's most formative years score much *lower on tests of vocabulary, reading comprehension, arithmetic, and general knowledge* [6].
- Six- to eleven-year-old *children from food-insufficient families* had significantly *lower arithmetic scores* and were more likely to have *repeated a grade*. Families were classified as food-deficient if they self-reported as sometimes or often not having enough food to eat [7].
- Even *moderate under-nutrition (inadequate or sub-optimal nutrient intake)* can have lasting effects and *compromise cognitive development and school performance* [8].
- Morning fasting has a negative effect on cognitive performance, even among healthy, well-nourished children. A test of the speed and accuracy of response on problem-solving tasks given to children who did or did not eat breakfast found that *skipping breakfast had an adverse influence on their performance on the tests* [9].

Proper nutrition enhances academic performance.

School breakfast programs have shown the effective role of nutrition in enhancing academic performance. Studies demonstrate participation in School Breakfast Programs:

- Improves school performance and reduces absenteeism and tardiness Relieves hunger and improves children's ability to succeed at school [10],[11],[12];
- Improves academic, behavioral, and emotional functioning and leads to increased math grades, lowered absenteeism, and improved behavior [14], [15];
- Increases composite math and reading scores, improves student behavior, reduces morning trips to the nurse, and increases student attendance and test scores [16];
- Strengthens children's psychosocial outcomes, lowering anxiety, hyperactivity, depression, and psychosocial dysfunction [17];
- Raises scores on basic skills tests and reduces tardiness and absenteeism among participants [18].

Increased physical activity leads to higher academic achievement.

Recent studies show:

- Academic achievement improves even when the physical education reduces the time for academics. A reduction of 240 minutes per week in class time for academics to enable increased physical activity led to consistently higher mathematics scores [19], [20].
- A recent study has shown a correlation between the SAT-9 test results with the Fitnessgram indicating that the physical well-being of students has a direct impact on their ability to achieve academically. Students with the highest fitness scores also had the highest test scores [21].
- Intense physical activity programs have positive effects on academic achievement, including increased concentration; improved mathematics, reading, and writing test scores; and reduced disruptive behavior. [22].
- Aerobic conditioning may help to improve memory. Exercise may strengthen particular areas of the brain, and oxygen intake during exercise may enhance greater connections between neurons [23].

The links between schoolchildren's nutrition, physical activity, and achievement was a key topic addressed at the Healthy Schools Summit, held in Washington, D.C. October, 2002. Chaired by former U.S. Surgeon General David Satcher, MD, PhD, with First Lady Laura Bush serving as Honorary Chairperson, the Summit kicked off the nationwide initiative.

David Satcher, MD, PhD is the founding chair and along with other members of the board, provides expertise and oversight to AFHK, a non-profit organization with 501(c)(3) status. The collaboration includes more than 40 national organizations and government agencies representing education, physical activity, health, and nutrition—such as the National Association of State Boards of Education, the National Association for Sport and Physical Education, the American Academy of Pediatrics, the United States Department of Agriculture, and the Centers for Disease Control and Prevention and the National PTA. In addition to providing ongoing guidance, these organizations contributed to the development of the October 2002 national Healthy Schools Summit, as well as to the formation and on-going guidance and direction of 51

AFHK State Teams. These teams are comprised of volunteer health professionals, teachers, administrators, parents and other concerned community leaders.

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**For further information about Action for Healthy Kids,
or to become involved in an AFHK State Team,
visit our website at www.ActionForHealthyKids.org**

Resources

[1] Bogden, J.F. *Fit, healthy, and ready to learn: a school health policy guide*. Alexandria (VA): NASBE, 2000; [2] Schoenthaler, S. Abstracts of early papers on the effects of vitamin-mineral supplementation on IQ and behavior. *Personality and Individual Differences* 1991;12(4):343; [3] Schoenthaler, S., Amos, S., Eysenck, H., Peritz, E., and Yudkin, J. Controlled trial of vitamin mineral supplementation: effects on intelligence and performance. *Personality and Individual Differences* 1991;12(4):361; [4] American School Food Service Association (ASFSA). Impact of hunger and malnutrition on student achievement. *School Board Food Service Research Review* 1989;(1, Spring):17-21; [5] Parker, L. *The relationship between nutrition and learning: a school employee's guide to information and action*. Washington: National Education Association, 1989; [6] Brown, L., Pollitt, E. Malnutrition, poverty and intellectual development. *Scientific American* 1996;274(2):38-43; [7] Alaimo, K., Olson, C.M., Frongillo Jr., E.A. Food insufficiency and American school-aged children's cognitive, academic, and psychosocial development. *Pediatrics* July 2001;108(1):44-53; [8] Center on Hunger, Poverty, and Nutrition Policy. Statement on the Link between Nutrition and Cognitive Development in Children. Medford, MA: Tufts University School of Nutrition 1995; [9] Pollitt, E., Leibel, R., Greenfield, D. Brief fasting, stress, and cognition in children. *American Journal of Clinical Nutrition* 1991;34(Aug):1526-1533; [10] Murphy, J.M., Pagano, M.E., Nachmani, J., Sperling, P., Kane, S., Kleinman, R.E. The relationship of school breakfast to psychosocial and academic functioning. *Archives of Pediatrics and Adolescent Medicine* 1998;152:899-906; [11] Kleinman, R.E. et al., Hunger in children in the United States: potential behavioral and emotional correlates. *Pediatrics* 1998;101(1):E3. [12] Office of Research, Education, and the Center for Nutrition Policy and Promotion, USDA. *American Journal of Clinical Nutrition* 1998;67(4):798S-803S; [14] U.S. Department of Health and Human Services. Guidelines for school health programs to promote lifelong healthy eating. *Morbidity and Mortality Weekly Report Recommendations and Report* 1996 Jun 14; 45:RR-9; [15] Barnard, A. Study links school breakfast, results. *Boston Globe* 2000 Nov 29; [16] Minnesota Department of Children Families and Learning. *School breakfast programs energizing the classroom* 1998; [17] Murphy, J.M. et al. Effects of a universally free, in-classroom school breakfast program: results from the Maryland Meals for Achievement Evaluation. Initial Report 1999 May 4; [18]; [19] NASPE, Executive Summary, *Shape of the Nation* 2001; [20] Shephard, R.J., Volle, M., Lavalee, M., LaBarre, R., Jequier, J.C., Rajic, M. Required physical activity and academic grades: a controlled longitudinal study. In: Limarinen and Valimaki, editors. *Children and Sport*. Berlin: Springer Verlag; 1984. 58-63; National Association for Sport and Physical Education (NASPE). New study supports physically fit kids perform better academically. 2002 [21]. Shephard, R.J. Curricular physical activity and academic performance. *Pediatric Exercise Science* 1997;9:113-126; [22] Symons, C.W., Cinelli, B., James, T.C., Groff, P. Bridging student health risks and academic achievement through comprehensive school health programs. *Journal of School Health* 1997;67(6):220-227; [23] .