

II. CROSSFIT KIDS SCIENCE

Why Work Out? Exercise And The Brain Function

By: Cyndi Rodi, CrossFit Kids Magazine, May 2006

We have been told consistent exercise is a necessary component of a long and healthy life. Yet, Americans are becoming less active with every passing year. This is never more evident than in our children and teens. The American Heart Association reports the average child spends four to six hours per day on the computer, watching TV, or playing video games. Clearly, the promise of longevity is not enough to get our children moving. But what if we could promise them success?

Research indicates that exercise can enhance scholastic performance. The Journal of Exercise Physiology looked at nearly 900,000 middle-school-aged children to investigate the link between physical fitness and performance on a standardized achievement test. Six fitness goals were assessed along with math and reading. Overall fitness scores and mean achievement scores rose in conjunction with one another. The more fit the child, the higher the test scores. This suggests a positive correlation between overall fitness and academic achievement. In 2005, New Scientist reported that walking three times a week for as little as half an hour improves learning, concentration and abstract reasoning by 15 percent. The same article cites a U.K. study in which 10- and 11-year-olds who exercised three to four times a week achieved higher than average grades on their exams.

Scholastic achievement is directly linked to higher functioning levels in the brain. Acta Psychologica (2003) compiled and analyzed statistics from dozens of studies on the short-term effects of exercise on cognition. Their findings offer compelling evidence that exercise can facilitate cognitive functioning. Benefits of exercise reported include the following: brain changes associated with better performance on an attention-taxing task; improved abstract reasoning in the higher mental processes of memory and “executive functions” involving planning and organization; and the ability to multi-task more effectively. Scientists can only speculate regarding this causal relationship. What is certain is that exercise increases cerebral blood flow, thereby delivering nutrients and oxygen to brain cells at a higher rate, a coup in terms of the physiology of the brain. Furthermore, this increased blood flow can cause cerebral blood vessels to grow larger, creating a healthier, more efficient brain. Perhaps more importantly, exercise aids in the generation and retention of nerve cells and neural pathways. Exercise positively affects the delivery of chemicals, known as “neurotransmitters,” to the brain. Neurotransmitters largely aid

brain function by countering the negative effects of cognitive-suppressing conditions such as anxiety and depression. This is likely where the practice of taking a walk to clear one’s head derived, as the physical nature of the walking actually reduces stress, thereby improving cognition. This exercise-induced delivery of neurotransmitters to the brain also provides the essential component of what is called the “brain-derived neurotrophic factor,” or BDNF, which one University of Irvine neuroscientist has termed a “brain fertilizer.” BDNF boosts the overall performance of the brain. It has also been reported that an increase in neurotransmitters helps “lock in” memories when they form, which may aid in the eventual recall of facts. This heightened brain function can facilitate scholastic achievement.

Just how much exercise is required to experience positive brain changes? Scientists have yet to place a value on the exercise needed to achieve cognitive benefits. However, research suggests the real advantages of exercise come from a commitment to regular activity, with the greatest benefits to the brain resulting from planned periods of aerobic exercise. A “dose” relationship exists, in that, increased amounts of exercise lead to heightened brain enhancements. This underscores the need for our children to be not only active on a daily basis but also to incorporate sessions of vigorous activity routinely. The ultimate responsibility for the health of children and teens falls squarely on the shoulders of parents. In an article titled “Top Ten Ways to Help Children Develop Healthy Habits,” the American Heart Association suggests methods for encouraging healthful, lifelong behaviors among our children, with “parents as positive role models” and “family activities” being listed as the primary means to this end. Experts warn that parents should not rely solely on school-based physical-education programs or involvement in team sports to fulfill their children’s exercise needs. Instead, children and teens should be taught the value of planned exercise sessions. This will allow for the formation of habits that will continue to benefit them long after “P.E.” and team sports have lost their interest.

Thomas Jefferson wrote, “A strong body makes the mind strong.” His concurrent recommendation of two hours of exercise per day may have been extreme, but his concept is clearly supported by modern science. Brain function is positively impacted by exercise. Although we may not be able to guarantee our children success, we can certainly help them gain a cognitive edge by encouraging them and modeling for them the practice of regular exercise.

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