

Does Physical Activity Influence Academic Performance?

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Relationship of Physical Activity and Academic Performance

A positive relationship of physical activity and academic performance has been explored through several studies conducted in the USA by the California Department of Education; Dwyer, Sallis, Blizzard, Lazarus, & Dean (2001); Dwyer et al. (1983); Linder (1999); Linder (2002); Shephard (1997); Tremblay et al. (2000); and others. These studies support one another in suggesting that when a substantial amount of school time is dedicated to physical activity, academic performance meets and may even exceed that of students not receiving additional physical activity (Shephard, 1997).

Co-author, Debby Mitchell became interested in the link between physical activity and cognitive ability after attending two summer workshops with Phyllis Weikart, Professor Emeritus at the University of Michigan. Weikart's concern was that children are having less opportunities to be physically active and develop basic motor skills that will enhance children academically.

Due to Weikart's influence, Mitchell performed a research study, "The relationship between rhythmic competency and academic performance in first grade children" (1994). The findings supported a link between academic achievement and the motor skills of maintaining a steady beat. Also motivated by Phyllis Weikart are Kuhlman & Schweinhart, who report in their discussions that children's timing has been found to be positively related to children's overall school achievement, as well as mathematics and reading achievement (1999).

Physical Activity Benefits

Youth receiving additional physical activity tend to show improved attributes such as increased brain function and nourishment, higher energy/concentration levels, changes in body build affecting self esteem, increased self-esteem and better behavior which may all support cognitive learning (Cocke, 2002) (Tremblay, Inman, & Willms, 2000) (Dwyer, Coonan, Leitch, Hetzel, & Baghurst, 1983) (Shephard, 1997).

Improved brain attributes associated with regular physical activity consist of increased cerebral blood flow, changes in hormone levels, enhanced nutrient intake, and greater arousal (Shephard, 1997). Cocke (2002) states "a trio of studies presented at the 2001 Society for Neuroscience Conference suggest that regular exercise can improve cognitive function and increase levels of substances in the brain responsible for maintaining the health of neurons." Brain function may also indirectly benefit from physical activity due to increased energy generation as well as from time outside of the classroom/away from studying; The increased energy levels and time outside of the classroom may give relief from boredom resulting in higher attention levels during classroom instruction (Linder 1999).

California Statewide Study of Physically Fit Kids

A cross-sectional study completed by the California Department of Education (CDE) (2002), included a sample of 954,000 students who were in grades five (353,000), seven (322,000), and nine (279,000). The study individually matched Stanford Achievement Test Ninth Edition (SAT-9) standardized test scores with results of the state-mandated, teacher administered, physical fitness test, known as the Fitnessgram. The six fitness standards included in the Fitnessgram are cardiovascular endurance, body composition, abdominal strength and endurance, trunk strength and flexibility, upper body strength and endurance, and

overall flexibility.

Results of the CDE (2002) study included a "statistical analysis indicating a distinct and linear correlation between students' academic achievement and fitness scores" in all three grades; higher academic performance was positively related to higher levels of fitness with the greatest academic gains in students who met three or more physical fitness standards.

This association was greater in mathematics than in reading. Additionally, females demonstrated higher academic achievement at higher fitness levels than the males. In looking at this information, it should be noted that this study is still in the process of working with academicians to reach a published state in a peer-reviewed professional journal.

Australia -Academic Performance, Physical Activity and Fitness in Children

Dwyer et al. (2001) completed a study on 7,961 Australian schoolchildren (7-15 year olds) using a questionnaire/fitness test for measurement of physical activity/physical fitness and a 5-point scale to depict academic performance. The questionnaire was administered by trained data collectors to four students at a time to ensure the questions were understood and the obtained responses were as accurate as possible. Questions requested information on the students' involvement in sport including frequency, time, and intensity in the past week. Additionally, information in reference to the subjects' mode of transportation to and from school as well as activities during morning recess and lunch breaks was sought.

The fitness test was administered by a trained testing team and consisted of indoor and outdoor tests. Each student's academic performance was measured via 5-point scale (which indicated excellent, above average, average, below average, or poor ratings) administered by a school representative, most often the principal. Additionally, information regarding school size and physical activity programs were also noted on a school questionnaire (Dwyer, et al. 2001).

After analysis of the results, Dwyer concluded that "consistently across age and sex groups, the [academic] ratings were significantly correlated with questionnaire measures of physical activity and with performance on the 1.6 kilometer run, sit-ups, and push-ups challenges, 50-meter sprint, and standing long jump. "

Hong Kong - Sport Participation and Perceived Academic Performance of School Children and Youth

Different from the above studies' tests of measurements, Linder (1999) used a questionnaire to gather data on both physical activity and academic performance of 4,690 9-18year old students in Hong Kong. Both tests were administered by trained data collectors to classrooms of students. Each student personally completed his/her questionnaires by rating their own physical activity and academic performance. After data analysis through the Statview computer program, results showed a significant but low correlation (more for the girls than for the boys) indicating that students who perceive themselves to have high academic performance generally participate in more physical activity (Linder, 1999). It is obvious that no direct correlations or causations can be assumed from this study, however a positive relationship between physical activity and perceived academic performance was found.

Conclusion

Enhanced brain function, energy levels, body builds/perceptions, self-esteem, and behavior have been attributed to physical activity and to improved academic performance. One cannot make direct correlations from the information offered. However it is obvious that many positive relationships have been suggested. Perhaps instead of decreasing physical activity, school officials should consider developing enhanced physical activity programs.