Relating Physical Education and Activity Levels to Academic Achievement in Children

What Was the Question?

Despite the increasing number of overweight and obese children in the United States, many schools are cutting physical education programs or reducing physical education requirements in favor of offering more academic courses. Such curricular changes are aimed at increasing students' academic achievement, but are not necessarily supported by research, as previous studies have shown positive relationships between academic achievement and physical activity or participation in sports.

Coe, Pivarnik, Womack, Reeves, and Malina (2006) hypothesized that increased physical activity, including the activity from physical education classes, could lead to better classroom performance because of the positive effects it has on arousal level, concentration, and self-esteem.

What Was Done?

The researchers enlisted 214 sixth-graders from one public school in western Michigan. Students were divided into two groups: a physical education class and an "exploratory class" (i.e., computer science or art). Both classes met every weekday for 55 minutes during one semester.

The data measured over the course of the school year for the two groups of students included height, weight, body mass index, amount of physical activity outside of school, academic grades, and fitness instruction time in physical education classes.

Students were asked about physical activities they had engaged in outside of school in the three days previous to class. The activities were divided into 30-minute time blocks, for which students were asked to identify the activity and its intensity level. The number of moderate-intensity and vigorous-intensity activity blocks and their corresponding MET values (i.e., energy required for the activity) were used to assess the students' overall activity level outside of school. Physical education classes were observed four times during the semester, and student activity levels—specifically quantity and type of physical activity—were recorded and analyzed. Academic achievement was measured from standardized test scores and students' grades in math, English, science, and world studies.

What Was Found?

The main finding was that enrollment in physical education classes was not related to academic achievement scores, but involvement in vigorous physical activity was. Students who engaged in vigorous activity outside of school at least 20 minutes per day, three days per week, were found to have higher academic scores.

The students in the physical education class spent an average of only 19 minutes out of a 55-minute class engaged in moderate-to-vigorous physical activity. Given that this amount and intensity of activity had no correlation to students' academic achievement, whereas there was a significant association between academic achievement and vigorous activity outside of school, the researchers propose that there may be a "threshold level of activity" necessary "to produce these potentially desirable effects."

What Does this Mean?

Overall, this study suggests a positive relationship between regular vigorous activity and improved academic performance. Many of the subjects who frequently engaged in vigorous activity did so through participation in sports outside of school. This suggests that participation in sports may meet the threshold intensity level for physical activity.

The study also shows that the students did not engage in adequate physical activity—for greater academic achievement or to meet *Healthy People 2010* guidelines—in daily physical education classes at school. This indicates a need for more vigorous activity during physical education classes in order to produce benefits. Students' socioeconomic status may also mediate the effect found, as it is known to affect participation in sports, engagement in higher levels of physical activity, and in academic achievement.

Ultimately, while causal relationships between physical activity and academic achievement remain uncertain, this study adds to the evidence showing that involvement in physical education does not have negative effects on academic achievement.

Reference

Coe, D. P., Pivarnik, J. M., Womack, C. J., Reeves, M. J., & Malina, R. M. (2006). Effect of physical education and activity levels on academic achievement in children. *Medicine & Science in Sports & Exercise*, *38*(8), 1515-1519.

—Abstracted by Beth Sigman Somerset, a graduate student in the Department of Exercise and Sports Studies at Smith College, Northampton, MA 01063.