A Mixed-Methods Evaluation of School-Based Active Living Programs

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Background: School-based programs to combat childhood obesity often lack resources to incorporate strong evaluation components. This paper describes a collaborative evaluation conducted by partners implementing Active Living by Design (ALbD) programs at one Chicago elementary school.

Purpose: To assess ALbD program outcomes by triangulating various forms of evidence gathered while implementing these programs.

Methods: An exploratory, mixed-methods design was used to collect and analyze data from numerous physical activity initiatives implemented at the school from 2004 to 2009. The researchers triangulated quantitative (student BMI data, student standardized test and discipline data, classroom physical activity logs, and student physical activity knowledge surveys) and qualitative (classroom physical activity logs and open-ended teacher surveys questions) findings to assess outcomes.

Results: Students continuously enrolled at this school from Grades 1 through 4, those most exposed to ALbD activities over time, had significantly lower BMI after 4 years, compared with peers who transferred to the school after Grade 1. Student achievement on standardized tests improved between 2004 (prior to initiating ALbD activities) and 2008. Visits to the Disciplinary Office dropped dramatically over the 4-year period. Teacher interviews and surveys and classroom Take 10! Program activity logs revealed that the program was implemented enthusiastically by all grades. The Physical Activity Knowledge Survey revealed a significant increase in physical activity knowledge after instituting these activities.

Conclusions: Collaborative efforts to amass and analyze a variety of data demonstrated the effects of implementing a variety of health promotion activities in one school, documenting the growth of a "culture of health" in that school community.

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Introduction

A common limitation facing many school-based programs designed to combat childhood obesity is a lack of resources to incorporate strong evaluation components into their interventions.[1] Active Living Logan Square, a community–university partnership, faced this situation when implementing multiple Robert Wood Johnson Foundation–funded Active Living by Design (ALbD) programs at one Chicago public elementary school.[2] To overcome this limitation, this exploratory mixed-methods study triangulated results from multiple data sources and analysis methods to assess the outcomes of implementing these ALbD activities at one school serving a primarily (98.5%) low-income, Spanish-speaking Latino immigrant community.[3]

The risk of childhood obesity and associated health problems in this population is high[4–6]; nationally, 43% of Latino children, and 47% of students at this participating school, are overweight/obese.[2,7] The partnership identified an urgent need to intervene on both sides of the energy equation, increasing children's opportunities for both active living and healthy eating. A description of the Healthy Eating by Design activities is included in a previous publication.[2]

To address these needs, from 2004 to 2008, the partnership collaborated with administration, teachers, and staff at one elementary school, built in 1991 without playgrounds, to implement ALbD activities promoting physical activity among children attending this

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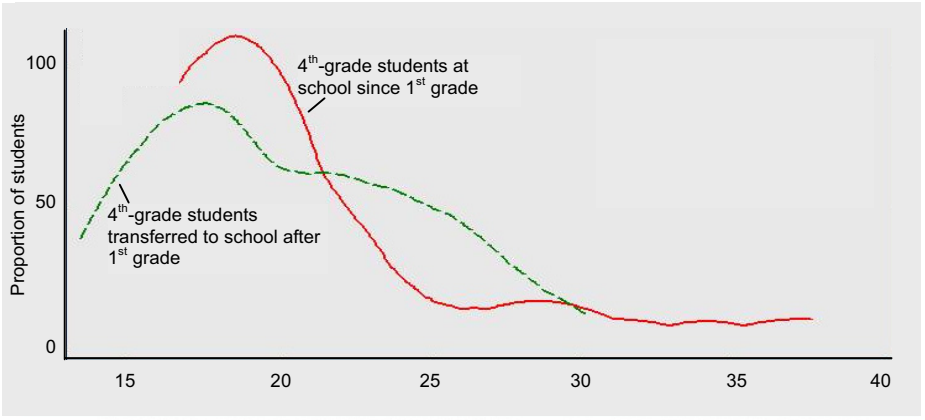

Figure 1. BMI for age and gender

Note: Figure shows a comparison of Grade-4 students continuously enrolled at the school since Grade 1 (n=52) with Grade-4 students who transferred to the school after Grade 1 (n=15).

school. Following the ALbD "five Ps" (preparation, promotions, programs, policy influence, and physical projects), the current intervention focused primarily on program activities and physical projects. Over a 5-year period, many ALbD activities were implemented at the school.

Activities included a Walking School Bus, bike lock library and bike stands, installation of two school playgrounds, initiation of daily recess, and Take 10!, a 10-minute in-class activity break integrating physical activity with classroom curricular content.[2,8] A playground for younger students was installed at the school in 2006, funded by Chicago Public Schools and Local Initiative Support Corporation's New Communities Program. In 2008, students entered an essay contest and won funding from the Nestle Foundation to build another playground for older children; thus, children experienced outdoor recess for the first time. The partnership collaborated to establish a Wellness Council at the school, supporting sustainability by encouraging teachers and staff to take ownership of these activities.

Methods

An innovative combination of strategies was used to track students' participation and to understand the effects of their involvement in this variety of activities. To assess long-term effects of the combined programs on this cohort of children, the university partner measured BMI (for age and gender) annually, using the CDC web-based calculator. School administrators measured academic performance using the Illinois Standard Achievement Test and Disciplinary Office visit data, to compare the 2004–2005 cohort of students, from the year prior to the introduction of ALbD activities, with students from 2005–2009, the ALbD years.

The parent volunteer who assisted classroom teachers in implementing Take 10! kept a written log that documented the number of weekly activity breaks and students' responses to the breaks; a teacher survey included open-ended questions about their experiences with Take 10! providing qualitative data about the program. These data were content-analyzed to identify the main program outcomes, strengths, and weaknesses. Physical activity knowledge was measured before and after the implementation of the Take 10! Program using the grade-specific survey included in the Take 10! Program materials.[9]

Results

Longitudinal student BMI data demonstrated that the 52 students in Grade 4 who had been enrolled continuously at this school since Grade 1, the cohort most exposed over time to ALbD activities, had a significantly lower BMI after 4 years, compared with the group of 15 students in Grade 4 who had transferred to the school after Grade 1 (independent t-test (n=67, mean BMI difference=0.9 points, SE=0.54, t=1.59, p=0.05; Figure 1). Academic performance data from 2004 to 2008 revealed a trend of continuous increases in the number of students who met or exceeded Illinois State Standards; improvements in students at this school outpaced those in the city- and state-wide areas. Compared with the 2004–2005 cohort, students in later cohorts (those who had experienced the ALbD activities) had higher achievement on Illinois State Achievement Tests (Figure 2).

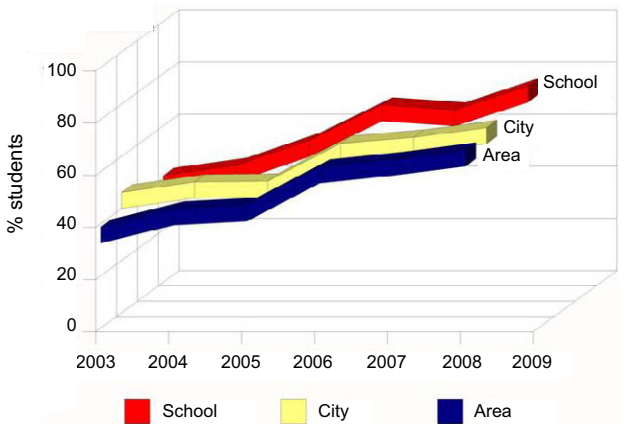

Figure 2. Percentage of students (school, citywide district, statewide area) who met or exceeded Illinois Learning Standards

Note: As measured by the Illinois Standard Achievement Test, 2003–2008

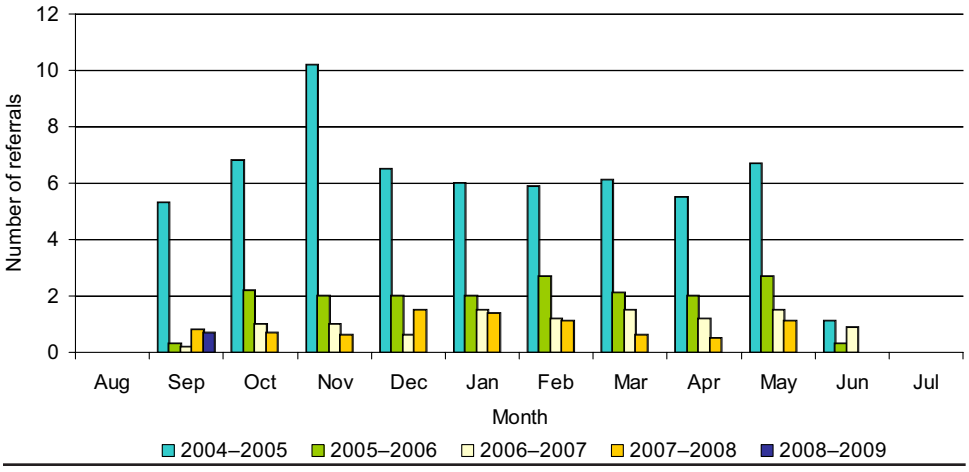

Figure 3. Average number of daily disciplinary office referrals by month, 2004–2005 to 2008–2009 school years

School Disciplinary Office data revealed that, compared with the 2004–2005 cohort, later cohorts (those who experienced the ALbD activities) had dramatically lower numbers of visits to the Discipline Office (Figure 3). Analysis of qualitative data from Take 10! classroom logs revealed a great deal of enthusiasm for the activities among both students and teachers. A parent volunteer who facilitated the program made this log entry after a visit to a Grade-2 class: *They all worked out and did excellent. We played the game "Real Life Math." They all enjoyed it and had tons of fun. Today we were recorded by Fox Channel 32 News.* (A video file of the news report highlighting the children performing Take 10! is available on request.)

Teachers reported implementing Take 10! for 30–50 minutes weekly, led by either the volunteer or themselves. Most teachers and students reported that students were more able to concentrate on learning after Take 10! breaks. One teacher commented that she started each day by having the class perform Take 10! "because it calms them down and students feel more focus and relaxed." Children increased their scores on Physical Activity Knowledge from a pretest mean score of 4.8 (SD=2.17) to a post-test mean score of 6.0 (SD=2.25; independent t-test of 1.2-point knowledge gain, SE=0.08, $t=15.05$, $p<0.001$).

Discussion

Results were triangulated from mixed-methods and multiple data sources to address the question *What have been the effects of implementing these ALbD activities at this school?* Children who had longer exposure to these activities maintained a healthier weight, compared with those who transferred to the school later in the course of the ALbD activities. As students' ALbD-related physical activity increased, school performance also rose, surpassing the average district scores on the Illinois State Achievement Tests. A dramatic drop in visits to the school Disciplinary Office accompanied the increase in opportunities for physical activity throughout the school day that resulted from implementing the ALbD programs.

Even without a control group, random sampling or other aspects of a strong research design, the triangulation of these multiple, related outcomes provided an overall assessment of positive effects of implementing a wide variety of health promotion activities at one school over a 5-year span. Data were gathered at little expense, and the positive feedback from the activities built momentum. Students, teachers and school administration were gratified to notice these changes accumulating and were motivated to continue many of the ALbD activities beyond the life of the funded project. A Wellness Council was established by teachers, with the support of administration. School personnel gradually have institutionalized, expanded, and sustained many of the activities, developing a "culture of health" in this school community.

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