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

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Background: School-based programs combating 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 (PA) initiatives implemented at the school from 2004-2009. The researchers triangulated quantitative (student BMI data, student standardized test and discipline data, classroom PA logs, and student PA knowledge surveys) and qualitative (classroom PA logs and open-ended teacher surveys questions) findings to assess outcomes.

Results: Students continuously enrolled at this school from 1st through 4th grades, those most exposed to ALbD activities over time, had significantly lower BMI after 4 years, compared with peers who transferred to the school after 1st grade. 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! activity logs revealed that the Take 10! Program was implemented enthusiastically by all grades. The Physical Activity Knowledge Survey revealed a significant increase in PA knowledge after instituting these activities.

Conclusion: 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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A common limitation facing many school-based programs combating childhood obesity is the 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 2004-2008, 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 school. Following the ALbD "five Ps" (preparation, promotion, programs, policy influence, and physical projects), our intervention focused primarily on program activities and physical projects. Over a 5-year period, many ALbD activities were implemented at the school. ALbD 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-sex annually, using the Center for Disease Control and Prevention 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 to implement Take 10! kept a written log that documented the number of weekly activity breaks and students' responses to the breaks; teachers' 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 4th grade students who were enrolled continuously at this school from 1st grade, the cohort most exposed over time to ALbD activities, had a significantly lower BMI after 4 years, compared with the group of 15 4th grade students who had transferred to the school after 1st grade (independent *t*-test ($N = 67$, mean BMI difference = 0.9 point, $SE = 0.54$, $t = 1.59$, $p = .05$; please see Figure 1).

Figure 1. BMI for age and sex: Comparison of 4th grade students continuously enrolled at the school since 1st grade ($n = 52$) with 4th grade students who transferred to the school after 1st grade ($n = 15$).

Academic performance data from 2004-2008 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, City-Wide District, State-Wide Area) who met or exceeded Illinois Learning Standards as measured by the Illinois Standard Achievement Test, 2003-2008.

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).

Figure 3. Average number of daily Disciplinary Office referrals by month, 2004-2005 to 2008-2009.

Analysis of qualitative data from TAKE 10! classroom logs revealed a great deal of enthusiasm for the activities among both students and teachers. The parent volunteer who facilitated the Take 10! program made this log entry after a visit to a 2nd grade 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 upon request.) Teachers reported implementing Take 10! 30-50 minutes weekly, led either by 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 significantly increased their scores on Physical Activity Knowledge from a pre-test mean score of 4.8 (SD = 2.17) to a posttest mean score of 6.0 (SD = 2.25; independent *t*-test of 1.2-point knowledge gain, SE = 0.08, *t* = 15.05, *p* < .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 PA 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 PA 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, and school personnel have gradually institutionalized, expanded and sustained many of the activities, developing a “culture of health” in this school community.

Acknowledgements

Active Living by Design programs were funded in part by generous support from the Robert Wood Johnson Foundation through Active Living by Design (Grant # 049762) to a collaborative group: Illinois Health Education Consortium, Logan Square Neighborhood Association and University of Illinois at Chicago College of Nursing. We acknowledge the administration, staff, teachers and students at the Sharon Christa McAuliffe Elementary, a Chicago Public School, and the parent volunteers who brought our ALbD program activities to life. For a complete list of funders and supporters, please see the *AJPM* article by Gomez-Feliciano, et al. in this paper’s reference list. We dedicate this work to the late Beverly J. McElmurry, whose passion for the health needs of school-aged children galvanized and inspired our collaborative journey.

No financial disclosures were reported by the authors of this paper.

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