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# Development and Implementation of a School-based Obesity Prevention Intervention: Lessons Learned from Community-Based Participatory Research

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## Abstract

**Background—**National, state, and local policies aim to change school environments to prevent child obesity. Community-based participatory research (CBPR) can be effective in translating public health policy into practice.

**Objectives—**We describe lessons learned from developing and pilot testing a middle school-based obesity prevention intervention using CBPR in Los Angeles, California.

**Methods—**We formed a community–academic partnership between the Los Angeles Unified School District (LAUSD) and the UCLA/RAND Center for Adolescent Health Promotion to identify community needs and priorities for addressing adolescent obesity and to develop and pilot test a school-based intervention.

**Lessons Learned—**Academic partners need to be well-versed in organizational structures and policies. Partnerships should be built on relationships of trust, shared vision, and mutual capacity building, with genuine community engagement at multiple levels.

**Conclusion—**These lessons are critical, not only for partnering with schools on obesity prevention, but also for working in other community settings and on other health issues.

### Keywords

Obesity prevention; adolescence; schools; community-based participatory research; lessons learned

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Although policy makers recommend changing school environments to reduce child obesity,1 broad policy recommendations often do not give guidance for translating policy to individual schools or tailoring policy to specific community needs and settings. Community-based participatory research (CBPR) can be an effective approach to develop strategies to address community health concerns and translate public health and preventive policy into practice.2–6 We used CBPR to test a school-based obesity prevention intervention for middle school students in the context of an established partnership between the Los Angeles Unified School District (LAUSD) and the UCLA/RAND Center for Adolescent Health Promotion (Center), a Prevention Research Center funded by the Centers for Disease Control and Prevention. We describe lessons learned about intervention development, pilot testing, and evaluation in the context of CBPR.

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# METHODS

## Community Policy Environment

The primary community partner for the research was LAUSD, the nation's second largest school district. Table 1 shows the demographic composition of the school district as a whole, as well as the school that participated in intervention pilot testing.

LAUSD is at the forefront of obesity prevention. It was one of the first school districts to ban soda and junk food (in 2004).[7,8] These policies predated California legislative efforts to ban low-nutrient foods in secondary schools (in 2005 and 2007).[9,10] LAUSD's 2006 Cafeteria Improvement Motion improved school meals' nutritional content (beyond federal standards); required the posting of point-of-sale nutritional information and improved cafeteria marketing; and mandated collaboration with parents, students, and communities (e.g., engagement in selection of food offerings, through methods such as taste tests; formal elicitation of input from community-based organizations and other community stakeholders) to increase participation in the National School Lunch Program, a United States Department of Agriculture program that provides free or reduced-price lunch to students in households with incomes at or below 130% and at or below 185% of the poverty level, respectively.[11] LAUSD's obesity prevention policy focus predated the partnership's obesity prevention activities, which were funded starting in 2005. Partly in response to the district's interest in obesity prevention and a request from LAUSD that the Center join with it in advancing obesity prevention, in 2005 the leadership team applied for the grant that funds the project described herein. For its obesity prevention work, the partnership used the current policies as a platform for designing an intervention that was consistent with LAUSD's policy goals and that aimed to translate LAUSD obesity prevention policies into practice within schools, by tailoring obesity prevention initiatives to fit the individual school context.

## Context of Community Partnership

Both LAUSD and the Center are full collaborative partners. LAUSD and the Center established a subcontract to define roles and responsibilities, which resulted in a project leadership team of investigators from LAUSD and the Center (the authors of this article). All leadership team members collaborated on project conceptualization, implementation, results interpretation, and dissemination. As part of the leadership team, the LAUSD Medical Director (first author of this article) represented LAUSD, served as the primary liaison of the team to LAUSD, and facilitated entry into schools and communication with school officials. The Center's members on the leadership team included two researchers who managed day-to-day intervention activities and informed the team about conceptual and methodological issues, and a community liaison who coordinated meetings with community partners and represented the project to community members. The leadership team's weekly meetings provided an ongoing forum for idea exchange and community input on intervention design.

The leadership team worked closely with LAUSD and Center staff to facilitate smooth project implementation that equitably involved members of both entities. For intervention evaluation, the leadership team set up a community–academic primary data collection team that was headed by a Center staff member and included two community members representing LAUSD programs. Members of the data collection team helped to develop and edit study instruments, recruited participants, discussed the program with school staff, and observed the intervention for quality assurance; the two community members also served as liaisons to local school administrators. The Center coordinated all intervention activities, supplied all intervention materials, and worked with liaisons from each school's administration and central and local Food Services Branch (FSB) staff to coordinate intervention responsibilities (e.g., securing rooms for intervention sessions, displaying intervention-related signage).

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The leadership team organized three different community advisory boards (CABs), each of which met quarterly with the leadership team. The Center's CAB (CCAB), which is focused on adolescent health in one local region within LAUSD, includes representatives from LAUSD (including principals), parent groups, Los Angeles County Department of Health Services, foundations, businesses, health care providers, and youth-serving organizations; the CCAB–Center partnership has existed since the Center's inception in 1998. The Center also has an established Youth CAB (YCAB), composed of high school students; although the YCAB's composition changes as students graduate, the YCAB infrastructure has been in place since 2003. A Healthy Living Advisory Board (HLAB), formulated at the start of the pilot intervention grant in 2005, consists of community stakeholders in LAUSD (including representatives from Health and Human Services and the FSB), Los Angeles County Department of Health Services and Department of Public Health, and from other county organizations that address youth obesity.

## Community Needs Assessment

During the proposal stage for the pilot intervention, CCAB members, LAUSD central district administrators, and LAUSD Board of Education members suggested that we develop a middle school–based intervention covering nutrition and physical activity. At the inception of the project, the data collection team conducted 14 focus groups with 119 middle school students, 8 focus groups with 63 parents (in English and Spanish), and 27 qualitative interviews with community stakeholders to assess community needs and priorities for obesity programs.[12] Structured site visits, in which data collection team members collected qualitative observational and interview data at four middle schools, were conducted to understand the school context of students' physical activity and food-related behaviors.13 At these visits, team members mapped cafeteria layout; observed food and beverage offerings and consumption, waste patterns, and employee–student interactions; spoke with school staff and students; and collected relevant documents. These procedures were invaluable in helping the partnership identify potential interventions that would advance school food and wellness policies.

LAUSD staff and CAB members had ongoing and significant input into the formative research design, identified community stakeholders for formative research, and provided insights for data interpretation and analysis. Formative research protocol topics were proposed by community stakeholders and reviewed by LAUSD FSB and physical education staff. Preliminary results were presented for open discussion and interpretation to the CABs, FSB administrators, and administrators and teachers from schools in which the research was conducted. At least one community member has been a contributing author to all study-related manuscripts.

## Community Contribution to Intervention Design and Pilot Testing

The needs assessment indicated that some LAUSD obesity prevention initiatives (e.g., improving cafeteria signage, engaging parents and students) presented challenges in implementation at the school level, owing to cost, cafeteria staffing shortages, and a lack of infrastructure for community engagement. Parents, students, and some staff at the individual school level were unaware of LAUSD's obesity prevention initiatives specific to improving the nutritional value of cafeteria food, which suggested a need for an educational component.

The CAB members and stakeholders we interviewed suggested that we develop an intervention designed to translate such policies into practice at the individual school level by working directly with schools. The community–academic leadership team took into account the needs assessment and CABs' input to design an intervention, Students for Nutrition and eXercise (SNaX) that aimed to empower middle school students to make healthy food choices and participate in physical activity inside and outside of school. A major component is a peer

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leadership program targeting school-wide norms and attitudes about physical activity, healthy eating, and school food. Another component focuses on school environmental changes, including enhanced nutritional food offerings, improved marketing (e.g., attractive cafeteria food signage, point-of-sale nutritional information), and increased availability of free water during lunchtime. The intervention components resulted from community members' and academic experts' recommendations, which included helping to translate LAUSD obesity prevention initiatives into practice; targeting all students, not just overweight youth; and focusing on early adolescents' developmental needs. Although LAUSD policies recommended similar school environmental changes, as well as engagement of parents and students, such changes had not yet been implemented.

CAB members and parents and students in focus groups contributed to the intervention's focus, delivery, content, and evaluation. For example, the peer leadership component arose from CAB meetings in which members emphasized the importance of student leaders as agents for change. Community partners felt a program could be sustained within LAUSD's established infrastructure for after school activities. Students participated in developing the intervention name (SNaX) and suggested materials (e.g., posters, signage) that would be effective among their peers. CAB members helped in optimizing recruitment (e.g., they suggested parent surveys be conducted via phone rather than mail) and assisted in the interpretation of process measures and intervention outcomes.

During the pilot intervention, we collected survey data from all seventh graders and a random sample of parents, school cafeteria sales records, and student physical fitness test records. Survey data were collected by the community–academic data collection team, and cafeteria and fitness records were supplied to the project by LAUSD. Surveying all seventh graders required a great deal of cooperation, planning, and backing at the individual school level from school principals, teachers, students, and parents, and included obtaining parental consent and using class time for surveys.

All research procedures were approved by RAND's and LAUSD's institutional review boards.

### Community Partnership on Next Steps

Pilot results indicated that the intervention increased servings of healthy foods and fruit in the cafeteria (Bogart, Elliott, Uyeda, Hawes-Dawson, and Schuster, preliminary communication, March, 2009). After the pilot, we discussed preliminary results with administrators, teachers, and food services staff at the intervention school and our CABs to elicit suggestions for intervention refinement for a randomized, controlled trial.

## RESULTS: LESSONS LEARNED

### Schools, Especially Those in Large Urban Districts, Have Multiple Levels of Administration, Which Require Multiple Levels of "Buy-In"

Researchers should be cautious in assuming that they have broad community input or support unless they have comprehensively explored multiple stakeholder layers, which are sometimes only evident by continually revisiting and re-engaging partners. The research team engaged partners at different vertical levels of administration, from the central district (e.g., assistant superintendent, Board of Education) to the local school (e.g., principal, cafeteria manager, teachers). The research team also engaged distinct horizontal stakeholder categories, each representing a different parallel arm (or division) of the organizational structure (e.g., Student Health and Human Services; Business Services Division, which contains the FSB).

To reach these vertical and horizontal stakeholders, we used a snowball process of asking for input about others who should be involved with intervention development. Inclusion of

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multiple categories of stakeholders led to both broad and deep insights. It was essential to use community members' personal and working relationships to open doors and "pave the way" to reaching key stakeholders. We also had an "open-door policy" for CAB attendees, such that members could feel comfortable inviting other key people to meetings.

Multiple horizontal and vertical stakeholders needed to be engaged for the intervention evaluation. For example, FSB administrators at the central and local district levels approved of our request to obtain and copy school cafeteria sales records. However, their approval was contingent on cafeteria managers' allowing records to be removed from the cafeteria for copying, and some managers did not feel comfortable with such procedures. Further, although we had approval from LAUSD's institutional review board to collect student fitness data with parental consent, we had to navigate though the local school and back to the central district (Planning, Assessment and Research Division) to retrieve the data. Schools may not have the capacity to transfer such data and they cannot release data without guarantees that the appropriate permissions, consents, and data sharing agreements are in place. Hence, there is an essential need for engagement, buy-in, and understanding related to the project at multiple levels.

## Communities, Just like Large Organizations, Have Multiple Levels of Stakeholders With Distinct Power Differentials, Requiring Cultivation of Separate Partnerships for Each Stakeholder Type

The need for three CABs arose out of distinct strengths of different stakeholder groups. Because the CCAB was already established and served a broad advisory function for several Center projects, it was uniquely positioned to guide project formulation, beginning at the proposal stage. Because the CCAB drew membership from the local community, it was invaluable in devising an intervention responsive to community needs and priorities.

The HLAB was composed primarily of higher level administrators in LAUSD and other county- and state-wide organizations focused on decreasing adolescent obesity. The HLAB could provide a broader and long-term outlook of addressing obesity both within and outside of LAUSD, and focused the study on solutions that would be sustainable and acceptable within the policy context. The HLAB's larger picture perspective was complementary to the local perspective of the CCAB.

In working with the YCAB, it was important to understand the power differentials between youth and adults; youth may be reluctant to participate in an advisory board dominated by adults or persons with power in their school or community. Thus, we selected a relatively young YCAB facilitator (a graduate student) who was not connected with the school district; the facilitator was able to engage youth and maximize their creative input while building their capacity to look critically at health and community issues. To provide a forum for YCAB input in the face of real and perceived power differentials, the YCAB was engaged in a Photovoice project before the start of this research. Photovoice methodology is a CBPR tool for identifying health-related concerns in a community by giving voice through photographs to people who often are not heard.[14] In their *Teen Photovoice Project*, YCAB members used photographs to design posters about the availability of unhealthy foods in their schools and neighborhoods, a topic that they selected.[15] Their insights provided one impetus for the current research.

Although the meetings of the three CABs often had similar agendas and content, the discussion and facilitation were geared to maximize each CAB's strength. Although the CCAB's strength was in its knowledge and understanding of the local landscape, HLAB members were recruited after the inception of the project to advise on obesity prevention from a county, state, and national perspective. YCAB members provided insight about adolescents, the primary recipients of the intervention. When the preliminary results of the pilot project were presented

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to each CAB, the CCAB suggested greater parent involvement and worked actively with project leadership to connect with parents; and the YCAB focused on alternative marketing strategies that are effective with youth (e.g., social networking, video). The HLAB suggested state policy changes that could support LAUSD's obesity prevention initiatives, including working with the leadership team to help a California State Assembly member introduce a bill focused on improving school water availability.

### Implementation of a Sustainable CBPR Intervention Requires Common Vision and Shared Priorities Among All Partners

The goal of the project was to develop and test an intervention that was feasible for school staff to implement on their own, cost effective, consistent with district and school priorities, and that LAUSD would ultimately choose to sustain. In the spirit of CBPR, the intervention was not designed to be a stand-alone program that an external entity would conduct in a school; the intervention required school resources and staff and needed to be integrated into the school's daily working environment. Thus, it was essential that all partners were committed to program success and that school staff, especially in the cafeteria, were motivated to increase their daily workload to implement a program that they believed would ultimately improve students' eating habits and health. For example, the intervention required that cafeteria staff offer cut fruit to students every day for a 5-week period, because the needs assessment indicated that students were less willing to eat (and more likely to discard) whole fruit. However, the intervention school cafeteria was understaffed, and the slicing of fruit would take staff an extra hour daily. Nevertheless, the pilot intervention showed great effects on fruit servings, and the cafeteria staff, who witnessed the power of the changes, decided to continue the program, even after the 5-week intervention period.

### To Influence Policy Change, It Is Important to Understand Schools' Political and Policy Environments

School districts often use policies or regulations to change school-level practices or environments. However, policy change does not always translate into practice. We found existing federal regulations and LAUSD policies that were consistent with project goals. Sometimes, community members were unaware of such policies or misinterpreted them; sometimes they were aware, but lacked the means, resources, or leadership to implement them. For example, when we attempted to offer free water with school lunches as part of our intervention, we found misunderstandings about whether this intervention component was in accord with federal, state, and district policies. Some stakeholders inaccurately believed that school beverage contracts prohibit serving free water in cafeterias, or that United States Department of Agriculture regulations forbid schools from serving water in cafeterias. Our clarification to constituents about current policy (and correction of misconceptions) allowed us to pilot test the provision of free water in the cafeteria as one strategy to address obesity in schools.

Translation of policy into practice requires understanding the community and working with community members who are directly affected by practice change. Our project complemented the policies of the LAUSD Board of Education, as well as the California state legislature, by aligning the intervention with district and statewide goals for obesity prevention. Interventions aligned with current policies (as opposed to inconsistent programs or programs that attempt to change policy themselves) may have a better chance of successful implementation.

### Capacity Building as an Outcome of CBPR Applies to Both Community and Academic Partners

When working with academic researchers on a project, communities often receive direct and indirect services, including critical knowledge to build research expertise (e.g., research

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methodology, grant writing). Capacity building can also take the form of helping communities to overcome up-front costs or "one-time" hurdles that can prevent policy change. For example, the design of cafeteria signs and marketing materials enabled cafeteria staff to serve food more efficiently and comply with policies about posting point-of-sale nutritional information. Although the research project incurred up-front costs, the materials were still being used in the school cafeteria more than a year after pilot testing.

Capacity building enables community members to readjust roles and responsibilities to implement policy. For example, FSB staff members were willing to take on additional responsibilities to enact policy change once they received training and resources. Such capacity building can lead to long-term practice changes, as new roles and responsibilities become ingrained in organizational culture.

Less attention is traditionally dedicated to capacity building among academic partners. In the present project, academic partners experienced significant capacity building, in terms of gaining knowledge in implementing CBPR methods; obtaining opportunities for community-based training among health services researchers, fellows, residents, and students; and building platforms on which to conduct other research projects aligned with community needs.

## CONCLUSION

The lessons presented herein were derived from joint analysis of a CBPR project by community and academic stakeholders. Other CBPR researchers have similarly described the need to invest time and resources for partnership building and to translate research to policy and policy to practice, as well as the reciprocal capacity building that occurs.[16,17] Our study extends this prior research by focusing on a large organization with multiple levels of bureaucracy and a large network of community stakeholders. We highlight the contribution of multiple stakeholders through three distinct CABs, and we emphasize the need for common vision and priorities to help sustain intervention efforts. Our lessons are applicable for other types of policy implementation in multilevel settings of bureaucracy, such as worksites, as well as school-based health programs related to substance use, violence, and sexual risk.

Future CBPR should determine how best to measure intervention outcomes, such as organizational policy change or individual behavior change, while simultaneously conveying the strength of community participation in effecting these changes. The success of a CBPR initiative is not always captured with standard research methodologies. However, some interventions may never be able to exist, and therefore would never be tested, without community support and insight. A challenge for the CBPR field is to develop valid process evaluation tools that capture the strength of the community–academic relationship and its effects on communities, program implementation, and policy and behavior change.

The lessons we advance are not only important for school-based interventions, but also may apply to other community settings with multiple stakeholder levels, including nonprofit and community-based organizations, public health departments, or the transportation or recreation sectors. With support and active involvement from all levels, school health promotion interventions are more likely to be both effective and sustained.

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## Table 1

Descriptive Characteristics of LAUSD Students as a Whole and in the Pilot Intervention School*

| | Asian/Pacific Islander | African American/Black | Hispanic/Latino | White | Learning English as a Second Language | Physically Fit† | NSLP Eligibility‡ | Student Enrollment |
|---|---|---|---|---|---|---|---|---|
| Pilot Intervention School | 24% | 10% | 62% | 4% | 19% | 27% | 77% | 1,971 |
| LAUSD (District-Wide) | 7% | 11% | 73% | 9% | 38% | 20% | 79% | 704,417 |

*Source:* Los Angeles Unified School District. Los Angeles School District Profile 2006–2007. Available from: http://notebook.lausd.net/schoolsearch/selector.jsp. Accessed October 23, 2008.

*Primary racial/ethnic group recorded by students.

†Number of students who met six fitness criteria (aerobic capacity, body composition, abdominal strength, trunk extensor strength, upper body strength and flexibility) divided by total number of eligible students in the tested grade level.

‡Number of students eligible for free and reduced-price lunch through the National School Lunch Program (NSLP).