



PREVENTING CHILDHOOD OBESITY: Research on Effective School-based Interventions



Overview of the Obesity Epidemic

Obesity is arguably the biggest threat to the health of Americans today, with about two-thirds of the adult U.S. population reported to be overweight or obese.¹ The rates of overweight and obesity have risen especially quickly among the nation's youth, with the percentage of children who are overweight more than tripling in the past 30 years.¹

Research has shown that children who are overweight are at a much higher risk as adults for developing chronic health conditions, such as Type II diabetes and heart disease.¹³ These statistics have prompted some experts to predict that the current generation of children will be the first in two centuries to have shorter life expectancies than their parents.²

California is no exception. Data from the 2007 California Health Information Survey (CHIS) estimates that 31% of adolescents ages 12-17 years old, and one in three California children ages 9-11 are at-risk for, or are already, overweight.³ The Centers for Disease Control and Prevention (CDC) estimates that between 1998 and 2008, California spent \$7.7 billion on medical expenditures attributable to obesity.⁴

Clearly, childhood obesity prevention needs to be a priority for Californians. This policy report examines the effectiveness of school-based interventions and their role in curbing the childhood obesity epidemic.

Why are schools a good place to intervene?

Schools are a natural place to identify health problems and offer solutions. Children spend 6-8 hours per day at school, making it a logical and convenient access point for obesity prevention.⁵ The established infrastructure of schools makes school-based intervention efforts one of the most cost-effective methods of preventing childhood obesity.⁶

School-based interventions eliminate transportation barriers faced by other obesity prevention programs and provide health care in a setting that students and families know and trust. The strong connection with families is especially important for interventions that target elementary school-aged children, as young children have very little control over their food choices and physical activity options independent of their parents' decisions.⁷

“Schools offer access to children, the facilities required for classroom and physical education interventions, and the personnel capable of being involved in such efforts.”

--Budd, et al., Journal of School Health 2006

In addition to standard school resources such as physical education (PE) and health education, more than 150 schools in California also have school health centers that can provide clinical services, nutrition counseling, case management, and mental health services to supplement traditional nutrition and fitness programs. Several of these school health center interventions, such as the Stockton Healthy Hearts Program (see spotlight box on page 3), have yielded promising results and provide the groundwork for future school-based nutrition and fitness programs.

Research Findings: How do school-based interventions make a difference?

A summary of randomized control trials and literature reviews published in peer-reviewed journals within the past ten years provides evidence that school-based interventions targeting childhood obesity are effective in the following ways:

Reducing BMI* in at-risk populations

The *Planet Health* program, a nation-wide two-year intervention targeting ethnically diverse middle school students, includes strategies such as: reducing television viewing; increasing physical activity; decreasing consumption of high fat foods; and increasing fruit and vegetable intake. A study showed that the odds of female participants becoming overweight* were reduced by 47% compared to females in the control group.⁸

Increasing healthy behaviors in youth

Two recent literature reviews on the effectiveness of school-based nutrition and fitness programs found that school-based interventions were generally effective in improving health behaviors, such as increasing fruit and vegetable intake, increasing more vigorous physical activity, increasing health knowledge, and decreasing sedentary behavior.^{5,13}

Preventing kids from becoming overweight

- A multidisciplinary obesity intervention in Philadelphia elementary schools uses a combination of school self-assessment, nutrition education, nutrition policy, social marketing, and parent outreach. A two-year follow up study of participants found that 50% fewer children in the intervention schools became overweight compared to the study's control schools.¹⁰
- The *CATCH* program, an intervention targeting low-income elementary schools with a large population of Hispanic students, includes components in nutrition, health curriculum, physical education, and family involvement. A study of the effects of the intervention showed that two years after the program had ended, participants had significantly smaller increases in overweight and risk-of-overweight* compared to children in the control group.¹¹
- The *Wellness, Academics & You (WAY)* elementary school-based intervention employs health curriculum integrated throughout the school year in classes such as physical education and biology. A study of fourth and fifth graders in four different states who were enrolled in the program showed significantly lower increases in BMI, improvements in diet, and increases in physical activity levels compared to control classes.¹²

*Terms and Definitions

Body mass index (BMI) -- a number calculated from a person's weight and height. BMI is age and gender-specific for children and teens, and is a reliable indicator of body fatness.

Overweight – A child or teen whose BMI score falls between the 85th and 95th percentile. The percentile indicates the relative position of the child's BMI number among children of the same sex and age.

Risk-of-overweight – A child or teen whose BMI score is above the 95th percentile.

(Derived from CDC definitions)



Providing cost-effective and cost-saving interventions

A cost-effectiveness analysis of *Planet Health* (see page 2) determined that even under the base-assumptions, the intervention translated to a net savings of \$7,313 to society and a gain of 4.1 quality-adjusted life years (QALYs) for participants. The intervention was therefore determined to be both cost-effective and to have a positive net benefit. *Planet Health* compared favorably with other public health campaigns, costing less per QALY than programs such as adult hypertension prevention and adult diabetes screening.⁶

Lowering the incidence of eating disorders in girls

The *5-2-1 Go!* program is a combination of the *Planet Health* curriculum (see above) and the “School Health Index for Physical Activity and Healthy Eating: A Self-Assessment and Planning Guide.” A study of middle school students enrolled in the program showed that the odds of eating disorders in the intervention girls were reduced by two thirds compared with girls in control schools.⁹

“School-based [obesity] prevention programs are likely to be cost-effective uses of public funds and warrant careful consideration by policy makers and policy planners.”

--Wang, et al., *Obesity* 2003



Spotlight: Healthy Hearts @ Edison High’s School Health Center

Edison High School in Stockton is one of more than 150 schools in California with a health center linked or located on campus. School health centers represent a unique way that schools can be utilized to prevent childhood obesity.

Background

When a survey revealed that **25% of 9th graders at Edison High were obese or at-risk for obesity**, school administrators knew they needed to take action.

The school health center’s existing resources, including a primary care provider, a registered dietician, and a mental health counselor, allowed staff to develop a multidisciplinary strategy focusing on both nutrition and fitness. The program, called “Healthy Hearts,” targeted migrant students and their families.

“We knew we needed to address the whole child, not just the weight,” said Deanna Staggs, the director of Edison’s school health center. “The health center allowed us to offer a level of support beyond what

these kids would normally receive at school, and in a place they felt comfortable.”

Program Components

- Clinical services, including measuring blood lipids, creating individualized nutrition plans, and tracking BMI
- Nutrition education and hands-on healthy cooking workshops for parents and students
- After-school salsa dancing and other physical fitness activities
- Mental health assessment and follow-up

Results

So far, Healthy Hearts has exceeded expectations. A one-year follow up of the program found that **60% of the participants experienced a decrease in their BMI score.**

For more information on school health centers, visit www.schoolhealthcenters.org

Research-based Recommendations for Program Development

- **Prevention should be the primary focus of school-based nutrition and fitness programs**
 - Several literature reviews have suggested that obesity prevention programs are much more effective than interventions that try to get obese individuals to lose weight. Furthermore, strategies focused on building healthy habits related to nutrition and activity have more stable long-term results as compared with strategies involving limiting behaviors, such as rigid calorie restriction.^{6,14}
- **Family involvement should be incorporated into school-based interventions**
 - A 2008 literature review of school-based obesity interventions found that study participants lost more weight in school-based interventions when family involvement was a part of the curriculum versus interventions that did not incorporate families.
- **Obesity Prevention efforts should include older children and adolescents**
 - While funding for school-based nutrition and fitness programs tends to favor elementary school students, literature has suggested that interventions targeting older children are also effective, largely because young adults have more control over their individual health choices.¹³
- **School-based interventions should be tailored to target populations**
 - **Age:** A literature review examining school-based interventions by age group found that interventions targeting elementary school students should focus on changing behavior that promotes sedentary activities such as TV-watching, while middle schoolers and high schoolers respond better to a combination of health curricula and more vigorous physical activity.⁵
 - **Sex:** A recent evidence-based literature review found that interventions had different outcomes based on the sex of participants. The article suggested that social support activities and learning in obesity preventions may be more appropriate for girls, while structural and environmental interventions enabling physical activity may be more effective for boys."¹³
 - **Language and Culture:** Multiple literature reviews stressed the importance of cultural considerations to the success of nutrition and fitness programs. Factors such as language, lifestyle, and beliefs are potential barriers for at-risk populations.^{5,7}
- **Schools-based interventions should be integrative and multi-component**
 - A study of a multidisciplinary school-based intervention concluded that mental health services are a needed component of any program designed to reduce obesity.¹²
 - A 2008 study of a policy-based intervention to prevent childhood obesity concluded that school programs should consider changing their own internal environment, such as improving physical education classes and creating more aggressive nutrition policies.¹⁰

School health centers (SHCs) are a promising method for optimizing the role of schools in the fight against childhood obesity. SHCs combine clinical services, health education, and nutrition and fitness programming where kids are – in school.



California School Health Centers Association
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