

# Weight Management and Obesity

## Symposium

Thomas N Robinson, MD, MPH discusses school-based interventions

# Preventing Obesity in Children and Adolescents

By Thomas N Robinson, MD, MPH

## Introduction

Five years ago, Dr Ken Resnicow (Professor of Behavioral Science and Health Education at Emory University) and I reviewed and summarized the results of all randomized controlled cardiovascular disease prevention studies conducted in US schools.<sup>1</sup> Across the studies, we found significant improvement in 65% of the smoking outcomes reported, 36% of the objective physical outcomes, 34% of the dietary intake outcomes, 34% of the lipid outcomes, 30% of the physical activity outcomes, and 18% of the blood pressure measures reported. At the very bottom of the list, there was significant improvement in only 16% of the adiposity outcomes reported.<sup>1</sup> These results suggest that obesity may be more difficult to change through school-based health education interventions than some of the other cardiovascular disease risk factors.

In this presentation, I describe some successful pediatric obesity prevention programs. I also identify factors which appear to be shared by these successful programs.

## The Stanford Adolescent Heart Health Program

Joe Killen and Michael Telch, two psychologists, in the mid-1980s started the Stanford Adolescent Heart Health Program (SAHHP),<sup>2</sup> which studied tenth-grade students at four public high schools in Santa Clara, California. In that study, two schools were randomized to intervention and two schools served as untreated control schools.

Based in social cognitive theory (the main theoretical framework for our work), the SAHHP included a 20-session, multirisk factor classroom intervention. We trained teachers to deliver the programs in the schools. Program goals were to increase physical activity and fitness and to decrease dietary fat

intake, body adiposity, and smoking. Assessment was done at baseline and two months after the end of the 20-session intervention.<sup>2</sup>

As determined from self-reports, the percentage of tenth graders who were physically active improved substantially in the treatment group compared with the control group. We defined physical activity as at least 20 minutes of physical activity three days per week and vigorous enough to “work up a sweat.” Consistent with the self-reports, we also saw significant improvement in resting heart rate, a measure of cardiorespiratory fitness, in both boys and girls. In boys and girls, statistically significant changes occurred also in self-reported low-fat, high-fiber food choices.<sup>2</sup>

The SAHHP also examined body mass index (BMI) as an objective measure of change in caloric balance. Compared with controls, boys in the treatment group had a statistically significantly smaller increase in BMI and girls in the treatment group had a decrease in BMI. Similar statistically significant changes were seen in triceps and subscapular skinfold thickness for the treatment groups.<sup>2</sup>

## TV Watching and Pediatric Obesity

Another school-based approach we have studied recently is reducing children’s television viewing.<sup>3</sup> This approach was tested at two public elementary schools in San Jose, California, in a total sample of 192 third- and fourth-grade children. One school was randomized to a curriculum developed to decrease use of television, videotapes, and videogames; we trained the regular classroom teachers to deliver this curriculum. Both schools received assessment at the beginning and at the end of the study in the fall and spring of a single school year.

Compared with children in the control school, the treatment school had about a one-

third reduction in use of television, videotapes, and video games. The intervention—which did not address physical activity or diet—resulted also in substantial improvement in BMI in the treatment school compared with the control school. BMI for the treatment school increased nearly half as much as in the control school, a difference of about two pounds per child of average height—quite a large reduction in weight gain for a non-high-risk sample. Children in the intervention school grew in waist circumference by nearly an inch less than with children in the control school.<sup>3</sup>

We are not the only researchers to report improvement from reducing television viewing. In a two-year intervention, Steve Gortmaker’s *Planet Health* program<sup>4</sup> also targeted television viewing—as well as physical activity and diet changes—in children attending middle school. Compared with the control group, girls in the treatment group had statistically different (lower) prevalence of obesity, a combined measure defined as BMI and triceps skinfold thickness greater than the 85th percentile.

## Results in Other School-Based Health Programs

In addition to classroom curricular programs, other approaches have targeted school food service programs, physical education, and, more recently, after-school programs. In controlled trials, no school food service intervention and only a few physical education interventions have had any effect on measures of body fatness. Almost no data exist so far for after-school programs.

Intervention relating to physical education is effective when researchers introduce other activities into the school day instead of changing physical activity within existing physical education paradigms. In one study,<sup>5</sup> we studied 81 seventh-grade students attending low-

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income schools in East Palo Alto, California. Of the 81 students, slightly more than half were girls, and the mean age was 12.5 years. The study population included mostly African-American and Latino students. Participants were randomized to a 12-week physical education program of either Hip-Hop dance (three days a week for 40 to 50 minutes during the regular “PE” period) or standard physical education led by the regular teacher. Medical students or undergraduates volunteered to lead the dance groups.

For girls only (compared with boys), the 12-week intervention produced statistically significant fitness benefits: Girls showed substantial response in resting heart rate and BMI. Girls in the dance program had no increase in BMI, whereas BMI increased in girls in the control group.<sup>5</sup>

The National Institute of Diabetes and Digestive and Kidney Diseases recently funded an after-school multiethnic dance program in schools for us. The program will offer African dance, Hip-Hop, *ballet folklorico*, Filipino dance, and Hawaiian dance for girls. In a randomized controlled trial, we will compare results of this after-school dance class program with results of a more traditional program consisting of nutrition and physical activity education.

The Stanford Girls Health Enrichment Multi-site Studies (Stanford GEMS) pilot study tested an intervention that included after-school dance classes and a family-based program to reduce TV viewing. In this 12-week pilot study, we studied eight- to ten-year-old African-American girls at high risk for obesity. These girls were randomized to either a nutrition education program with newsletters, community lectures, and nutrition demonstrations for families or to an intervention consisting of family TV reduction and after-school dance classes.

No statistically significant differences were seen in this pilot study, which included 61 families. However, in only 12 weeks, the girls receiving the dance and TV viewing reduction intervention gained only about half as much in BMI and waist circumfer-

ence as did girls in the nutrition education group. This result is promising, and we have received funding to conduct a full-scale trial with 260 families.

### Conclusions: What We Have Learned

As these programs have shown, successful models for childhood and adolescent obesity prevention do exist—and so do unsuccessful approaches. We must build from successful models and must stop replicating the models that haven’t worked. We have learned also that we must focus on obesity as a behavioral problem by targeting specific, “countable” and changeable types of behavior that contribute to energy intake and expenditure.

The effective programs have been strongly based on theories of behavioral change and include motivation as an important component. Our pediatric patients—and the public—are not as motivated by future good health as we clinicians are. Instead, they’re motivated by things like fun and taste. We must therefore think less about what motivates us and must instead think more about what motivates our target audience.

Another important observation is that the minimum length of the pilot studies discussed was 12 weeks and consisted of more than health lectures. Successful programs deliver a large dose of content and include many sessions over a long duration.

Future school-based research should focus on improving interventions and on small-scale efficacy trials. Etiologic research is also very important, but to make any progress in slowing the obesity epidemic, we need to focus much more on efficacy trials of specific behavioral strategies (including environmental change strategies) followed by large-scale effectiveness trials to help translate the efficacious strategies into effective public health programs. We need also to study how best to disseminate successful programs. For example, even if an intervention is successful in Oakland, California, we may not know how to extend it to other locations and populations across the country. ❖

### After the presentation, Dr Robinson answered questions from the audience:

#### How did you get children to watch less television?

**Dr Robinson:** We started by creating a challenge for them. Eight- to ten-year-old kids are often motivated by a challenge, especially if adults doubt that they can do something.

Then, through self-monitoring activities, we made the kids aware of how much time they spent watching TV. We asked them, “What do you really like to do with your time?” Most kids don’t place television viewing at the top of this list; most kids would rather play with their pets, build things, or play with friends. Kids pick their own motivators; we just point out how much more of these activities the kids could do if they watched less television.

Next, a “television turnoff” challenged kids to go without television, videotapes, or video games for 7 to 14 days. This approach builds confidence and skills to go without TV. We also deliver a series of lessons to help promote efficacy of the approach. Many kids—about two thirds in our studies—can go without television for this period of time.

We then add competition, self-challenge, and levels of achievement to the program. We focus on goal-setting by saying, “You don’t have to cut out television altogether. Just choose a goal and try to stay under that.” Most classrooms came up with a 7-hour-per-week goal. No intervention study has shown a good dose-response threshold for TV viewing, but limiting TV viewing to one hour per day makes sense.

Kids moved from one level of achievement to the next; we thus used the same strategy that video games use. Kids don’t need prizes or big awards; they can be given the opportunity to clean the blackboard or to collect papers for the teacher. Things we might otherwise think of as punishment seem like privileges to a child in a classroom.

We also worked on “intelligent viewing,” a process in which the whole family identifies beforehand what they want to watch. For in-

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stance, if the baseball *World Series* is scheduled to be on, each family member must know that you can't watch an hour of TV every day of the week and still have enough TV time left to watch the game.

We worked with families on environmental change too, but that's a very tough area to change. Televisions are at the center of many homes, and parents can be more resistant to change than children are. Parents are enlisted in the process by focusing on children.

**What level of concern about obesity do you see among school boards or superintendents of schools?**

**Dr Robinson:** The level of concern is rising, but even school districts that adopt these programs hesitate to end soda contracts in high schools or to eliminate fast food from the cafeteria. The school districts feel dependent on these sources of revenue, perhaps because California schools are so poorly funded. The same situation may be the case in other parts of the country.

**The Los Angeles Unified School District School Board just passed a policy banning availability of sodas throughout all**

**schools starting in 2004.<sup>6</sup> How can we encourage this type of policy change?**

**Dr Robinson:** I support the use of policy to change the food environment to which kids are exposed in schools. However, I haven't come up with a way of doing it. I think that this change must come from parents and from leaders in the community, because each school district is independent.

**Dr Dietz:** Communities can receive income from vendors and still offer healthful options. And school districts can carefully restrict the availability of those vending machines and determine what is stocked in them.

**School foodservice programs that have been successful in getting healthy choices included have worked closely with stakeholders and student leadership to be sure that school cafeterias offer menu selections that the students will eat. ❖**

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## Teach Them Well

The grandfathers and the grandmothers are in the children; teach them well.

— Ojibway proverb