

Prevention of the Epidemic Increase in Child Risk of Overweight in Low-Income Schools

The El Paso Coordinated Approach to Child Health

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Objective: To assess the impact on children's health of translating an evidence-based national intervention trial (Child and Adolescent Trial for Cardiovascular Health [CATCH]) to low-income elementary schools with primarily Hispanic students.

Design: An untreated, matched control group design with repeated dependent pretest and posttest samples was used.

Setting: Four El Paso CATCH and 4 control elementary schools in El Paso, Tex, along the US-Mexico border region. All had Title I status (most were low-income students).

Participants: Participants were 896 third-grade children (473 control schools [224 girls and 249 boys] and 423 CATCH schools [199 girls and 224 boys]); 93% were Hispanic.

Intervention: Community-based implementation of the national CATCH program.

Main Outcome Measures: Risk of overweight or overweight, body mass index, waist-to-hip ratio, yards run in 9 minutes, passing rates for Fitnessgram national mile

standards, moderate to vigorous physical activity and vigorous physical activity in physical education class, and percentage of fat and sodium in school lunches.

Results: Girls in control schools had significant increases in percentage of risk of overweight or overweight from third (26%) to fifth (39%) grades, as did girls in CATCH schools (30%-32%); however, the rate of increase for girls in the CATCH schools was significantly lower (2%) compared with the rate for control girls (13%). A similar pattern was seen for boys, with a rate of increase for boys in CATCH schools of 1% (40%-41%), which was significantly less than the 9% increase (40% to 49%) for control boys.

Conclusions: The translation of the national CATCH program to low-income schools with Hispanic students successfully slowed the epidemic increase in risk of overweight or overweight seen in control school children. An emphasis should be placed on community organizing and evaluation feedback when implementing evidence-based school health programs in low-income Hispanic communities.

Arch Pediatr Adolesc Med. 2005;159:217-224

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HIGH RATES OF INACTIVITY and consumption of high-calorie diets are likely responsible for the high prevalence of obesity in children in the United States.¹⁻⁶ Physical inactivity, overweight, and obesity are more prevalent in Hispanic adults and children compared with other ethnic groups.^{4,6-14} The cost and poor outcomes of many intervention strategies for chronic and lifestyle diseases have led to a focus on prevention as a strategy for effective health care management.¹³ Much of this preventive effort has begun to focus on children because behaviors learned in childhood may track into

adulthood.¹⁵⁻²¹ The Healthy People 2010 objectives clearly indicate that schools should provide an opportunity for preventing and treating obesity by promoting physical activity and healthy eating habits.²² The efficacy of several school-based interventions aimed at promoting healthy behaviors has been tested within the last 15 years.²³⁻²⁹

Of all of these evidence-based programs, the Child and Adolescent Trial for Cardiovascular Health (CATCH) was the most comprehensive and ambitious approach, targeting many aspects of coordinated school health in 96 elementary schools throughout the country.³⁰⁻³⁶ Luepker et al³² reported many systemwide

PARTICIPANT SCHOOLS

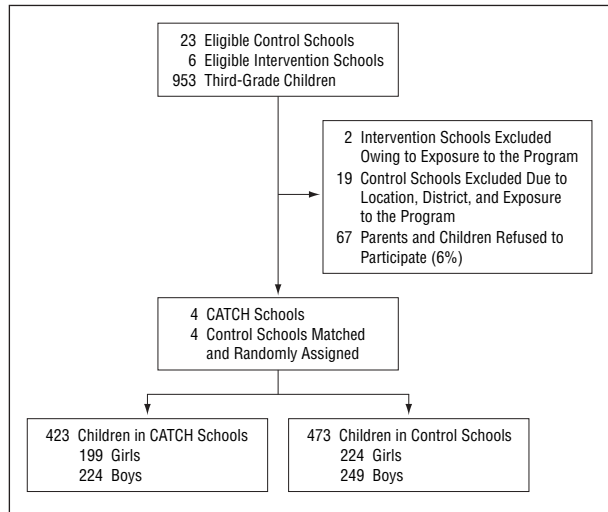


Figure 1. The process of recruitment of schools and children for participation in the El Paso Coordinated Approach to Child Health (CATCH) outcome evaluation.

changes and changes in children's behavior; however, there were no changes in physical health indexes. Following the end of phase 2 of the trial (1991-1994), the materials for the CATCH program were made available to the public through the National Heart, Lung, and Blood Institute (Bethesda, Md). The CATCH program is now called the Coordinated Approach to Child Health. Currently, the CATCH efforts are focused on disseminating the program throughout the country in elementary schools.³¹ The first site in the dissemination effort was El Paso, Tex, which is 78% Hispanic and dominated by low-income families.³⁷

Although evidence-based medicine seeks to improve the quality of practice through providing systematic information on proven intervention strategies,³⁸ the success of translating the programs tested with rigorous research methods into community practice has not received much attention in the health promotion literature. Establishing the efficacy of an intervention with a narrow range of conditions is an important step; however, these findings may not generalize to field settings that differ on variables that may moderate intervention effectiveness (fewer resources and different target audiences).³⁹⁻⁴¹ Successfully tested health promotion programs have little utility if they are not translated to real-world settings and incorporated into the day-to-day operations of school systems.

This report describes the outcomes of an effort to translate a school health curriculum, tested with a national clinical research trial, into community low-income school settings: the El Paso Coordinated Approach to Child Health (El Paso CATCH). The program and its adoption in the El Paso community have been described in detail elsewhere.^{37,42} The present study describes quasi-experimental findings for children's and school health outcomes. We hypothesized that low-income schools would tailor the El Paso CATCH program to their resources and needs, leading to a significant impact on the rates of child risk for overweight or overweight compared with the risk for overweight or overweight in matched control schools.

A pretest-posttest, matched control group, quasi-experimental design was used to evaluate the health outcomes of the El Paso CATCH.⁴³ In fall 1999, when the study began, the El Paso CATCH program had been in existence for 2 years. At that time, approximately 20% of all eligible schools in the El Paso, Tex, and Las Cruces, NM, school districts had enrolled in the program. Four intervention schools were chosen randomly from those schools that had completed an application to participate in the El Paso CATCH program in fall 1999. Control schools were first matched to these schools primarily by district and geographic location, and then 4 were randomly selected to participate. **Figure 1** summarizes the selection process.

School principals and participating staff were approached to participate in the study, and all aspects of the study were explained. Schools that participated in the evaluation ranged from 95% to 99% Hispanic. Schools also had 82% to 92% of their children eligible for free or reduced-cost meals or some other form of public assistance, and 33% to 72% of their children had limited English proficiency.

PARTICIPANT CHILDREN

Participants were 896 third-grade children (473 control schools [224 girls and 249 boys] and 423 El Paso CATCH schools [199 girls and 224 boys]) who had provided assent and who had parents or legal guardians who had given consent. All information about the study was available in Spanish and English. These children were predominantly Hispanic (93%). From all third-grade class rosters, 94% of families agreed to participate, and there was no difference in participation between El Paso CATCH and control schools.

Children were followed up into fourth and fifth grades. For aerobic fitness only, children were also tested in the sixth grade. Children were lost to follow-up ($n=152$) because they moved out of the El Paso area or could not be located in any of the El Paso or Las Cruces school systems. No children or their families withdrew from the study once they agreed to participate. Approval for the project was obtained from the institutional review board at the University of Texas at El Paso and from the Socorro and Ysleta Independent School Districts in El Paso (Figure 1).

INTERVENTION PROGRAM

The implementation and institutionalization of the El Paso CATCH program have been detailed elsewhere.^{37,42} Briefly, the program is funded by a local not-for-profit foundation called the Paso del Norte Health Foundation (www.pdnhf.org) and supported administratively by the Texas Region 19 Educational Services Center (El Paso). In 1997, the foundation made a \$1.4 million commitment to El Paso CATCH for 5 years to implement both the physical education (PE) and cafeteria components of the program. Each of 18 schools received \$3500 for the first year, \$2500 for the second year, \$1500 for the third year, and \$1000 for the fourth year of their participation in the program. The money went toward purchasing equipment for PE, paying for substitutes so that PE teachers and food service staff could attend training, and promotion of CATCH at each school. In addition, money was available to pay trainers and evaluators to come to El Paso from the national CATCH sites of Texas and Louisiana. The Texas Diabetes Council (Austin) subsidized the purchase of the National Heart, Lung, and Blood Institute CATCH program materials (CATCH PE guidebook,

PE activity box for grades 3-5, third-, fourth-, and fifth-grade curriculum materials, and the Eat Smart manual).

Two members of the original CATCH program from the University of Texas at Houston School of Public Health conducted the initial training for the CATCH PE, Eat Smart, classroom curriculum, and Home Team components. The first training sessions in 1998 were for the foundation staff, PE teachers, and food service staff. To implement El Paso CATCH in stages, the classroom curriculum and Home Team components were not disseminated until fall 2000. Under the direction of the foundation, CATCH was implemented in the fall of the 1998-1999 school year in 18 Title I elementary schools in El Paso and Las Cruces. In the second year (1999-2000), 22 Title I schools were added, and in the third year (2000-2001), 30 Title I schools were added. Currently, the foundation supports 108 schools with grants of \$3500 for each of 4 years. A variety of schools participate in El Paso CATCH, including ones from low-, middle-, and high-income neighborhoods as well as parochial and primary schools.

Although the training sessions presented national CATCH materials and procedures, there was a distinct emphasis on adaptation rather than fidelity (using materials exactly as they were designed). How the program was adapted to a low-income US-Mexico border region has been detailed elsewhere³⁷ and included ethnic variations on curricula, particular school- and district-based criteria variations, and variations due to regional and statewide educational and health mandates. One of the most noticeable differences from the national CATCH implementation was that schools were allowed to implement each component of El Paso CATCH in a way that suited the school environment. For instance, some schools did not use the classroom curriculum for anything but a general reference and had classroom teachers participate in schoolwide CATCH events each year instead.

Control schools did not receive any of the El Paso CATCH program materials and did not attend any of the training for the program. However, they received \$1000 at the beginning of each school year as an incentive for participation. At the beginning of the fourth-grade year, each school (control and CATCH) was presented with its summary results from third grade. They received the comparison values from national samples, did not see any other school's results, and received these results only once during the evaluation period. No schools were given any suggestions with regard to altering these results. This information was provided to all schools because of the importance of involving community in evaluation during program institutionalization and to control for the effect of feedback on child health and school changes.

CHILD HEALTH MEASUREMENTS

Risk of Overweight and Overweight

The latest public health recommendations for reducing risk of overweight and overweight in children have concentrated on using percentile ranks for normal growth as a way of evaluating a child in relation to his or her peers.⁴⁴ Therefore, to provide clinical relevance to the findings for this study and to link research to practice, we used risk of overweight and overweight as our main children's health outcomes. Risk of overweight and overweight were defined as equal to or exceeding the 85th and 95th percentiles of body mass index (BMI) (calculated as weight in kilograms divided by the square of height in meters), respectively, for sex and age using the newest Centers for Disease Control and Prevention growth charts.⁴⁴ Following convention,⁴ data are presented as risk of overweight or overweight (anything at or above the 85th percentile of BMI).

Aerobic Fitness

Fitness was assessed with a 9-minute timed run during PE classes in temperatures below 80°F. Previous research by Luepker et al³² and Turley et al⁴⁵ demonstrated high test-retest reliability for this procedure in a similar sample of boys and girls. Fitness testing was conducted in the early fall semester (August, September, or October) of each year of the project. Aerobic fitness data were compared with performance on the national FITNESSGRAM⁴⁶ mile run standard using the following formulas: passing for 9-minute run for third-grade boys=(1760 yd/13 min) × 9 minutes, which is 1218 yd completed in 9 minutes; passing for 9-minute run for third-grade girls=(1760 yd/14 minutes) × 9 minutes, which is 1131 yd completed in 9 minutes. For fourth, fifth, and sixth grades, the standards were increased according to the national age category recommendations for boys and girls.⁴⁶

Anthropometry

Anthropometry included height, weight, and waist and hip circumference for all children. At least 3 people were trained to collect these measurements using a sample of 100 young adults and 50 children (training period). Each person's measurements were compared with an experienced technician's values (the trainer), and reliability was established at a minimum of $r=0.90$ for all measures before data collection. Anthropometry was conducted in the late fall or early spring semester (November, December, January, or February) of each year of the project. At the beginning of each measurement period following third grade, reliability was reestablished at $r=0.90$ for all measures (reliability checks) in a small subsample of children ($n=30$).

Reliability was conducted by having each person involved in training and/or reliability checks collect 3 measurements of height, weight, triceps skinfold, and waist and hip circumference for the same sample of adults (for training) and children (for training and reliability checks). These values were averaged for each person, and then this average was compared statistically with the trainer's average for each anthropometric measure using a Pearson product moment correlation coefficient. If correlations were below $r=0.90$, individual measures were examined for errors, these errors were discussed, and then a new set of measurements were obtained. Research assistants who could not achieve acceptable agreement were not allowed to collect anthropometric data.

SCHOOL HEALTH MEASUREMENTS

Physical Activity During PE Class

The System for Observing Fitness Instruction Time (SOFIT) was administered to both El Paso CATCH and control schools to objectively assess the quantity and quality of physical activity in PE classes.⁴⁷ Each school in the study was observed for grades 3, 4, and 5 for 2 nonconsecutive days in 2 nonconsecutive weeks each semester (August-September in fall; April-May in spring) of the school year (a total of 8 observation periods per year per school). The validity and reliability of SOFIT have been established using self-reported diet and physical activity, heart rate monitoring, and motion sensors.^{47,48} Observers were trained to obtain an interrater reliability greater than $r=0.90$ before collecting any outcome data. Reliability was reestablished among observers before the beginning of all observation periods after third-grade fall semester measures.

Table 1. Sample Characteristics at the Third Grade

Characteristic	Control		Intervention	
	Boys (n = 211)	Girls (n = 189)	Boys (n = 175)	Girls (n = 169)
Age, mean (SD), y	8.3 (0.5)	8.3 (0.5)	8.3 (.0.5)	8.2 (0.45)
Height, mean (SD), cm	132.13 (5.94)	131.88 (5.92)	131.88 (6.30)	131.19 (6.68)
Weight, mean (SD), kg	32.90 (9.21)	31.52 (8.16)	32.30 (9.13)	30.78 (8.81)
BMI, mean (SD)	18.66 (4.08)	18.10 (3.62)	18.44 (3.99)	17.82 (3.50)
Passing, %*	60	55	59	54
Risk of overweight, %	17	8	17	17
Overweight, %	23	17	22	13

Abbreviation: BMI, body mass index (calculated as weight in kilograms divided by the square of height in meters).

*Indicates passing Fitnessgram national standards for that age level.

Table 2. Health Outcomes for the El Paso Coordinated Approach to Child Health (CATCH) Program for Each Dependent Measure in Each Grade of the Study

Characteristic	Third Grade		Fifth Grade		Third to Fifth Grade Change for Control vs Intervention*
	Control	Intervention	Control	Intervention	
Yards run in 9 min, mean (SD)					
Boys	1269 (211)	1266 (231)	1369 (276)	1398 (292)	111 (77 to 144) vs 126 (92 to 160)†
Girls	1169 (187)	1171 (164)	1268 (206)	1270 (234)	92 (64 to 120) vs 101 (66 to 136)‡
Passing Fitnessgram standards for 1-mile run, %					
Boys	60	59	31	46	-29 (-35 to -23) vs -13 (-18 to -8)†
Girls	55	54	36	38	-19 (-25 to -13) vs -16 (-22 to -10)‡

*Change scores are shown as mean (95% confidence interval).

†Significant changes from third to fifth grades.

‡Significant changes from third to fifth grades and significant increases in control girls compared with girls from El Paso CATCH schools from third to fourth grade.

Cafeteria Meal Quality

For both control and CATCH schools, school breakfast and lunch menus and their recipes were collected for 5 consecutive days during each semester in every year of the study. Recipes for these menus were obtained by interviewing cooks and kitchen managers in school cafeterias and by reviewing the cafeteria production sheets for each meal. Foods from the menus, production sheets, and recipes were entered into a nutritional database that is especially useful for ethnic foods (ESHA Research Inc, Salem, Ore). Once the nutrient content of the meals was analyzed, averages of breakfast and lunch values across the 5 days of data collection were obtained. Methods followed those outlined for the national CATCH cafeteria evaluation.⁴⁹

Multilevel Mixed-Model Analyses of Variance

As with the national CATCH trial and various other experimental studies of school health, the statistical design of the present study was complicated by the lack of independence of data due to nesting of individuals in settings.⁵⁰⁻⁵² Outcome measures with continuous data were analyzed with the Proc Mixed program of the SAS System (SAS statistical software, version 8.2; SAS Institute Inc, Cary, NC). Outcome measures with dichotomous data were analyzed with the GLIMMIX macro of the SAS System. School level-dependent measures were analyzed by group and time with the χ^2 statistic for proportions.

RESULTS

The study design and numbers of participants are shown in Figure 1. For the third grade, El Paso CATCH schools and matched control schools were similar in most variables (**Tables 1, 2, and 3**). However, control schools had higher levels of moderate to vigorous physical activity (MVPA) at the beginning of third grade compared with CATCH schools ($P < .001$) (Table 3), and girls from El Paso CATCH schools had higher waist-to-hip ratios ($P = .01$) and a higher percentage of risk of overweight ($P = .001$) than girls from control schools in third grade (Table 1).

All schools were retained throughout the study. Ninety-one percent of children who participated in the study in the third grade were retained for the fourth grade, and 83% were retained for the fifth grade. A total of 152 children were completely lost to follow-up. There were no differences in any dependent measure at the third grade between children lost to follow-up and the other children in the study. In addition, across all study points (third, fourth, and fifth grades), there were no differences in any of the dependent measures between children who stayed in the same school and children who did not remain in the same school. Findings are thus presented for an intent-to-treat sample of all children for whom we have measures ($n = 744$) (Figure 1).

Table 3. School Health Outcomes for the El Paso Coordinated Approach to Child Health (CATCH) Program

Outcome	Third Grade		Fourth Grade		Fifth Grade	
	Fall	Spring	Fall	Spring	Fall	Spring
Time spent in moderate to vigorous physical activity (goal $\geq 50\%$), %						
Control	38	43	53*	54*	44	63*
El Paso CATCH	30	52	56†	57*	55†	60*
Time spent in vigorous physical activity (goal $\geq 20\%$), %						
Control	11	15*	13	12	6*	10
El Paso CATCH	10	16*	16†	13*	12†	12†
Fat in school lunches (goal $\leq 30\%$), %						
Control	36	36	31*	36	33*	32*
El Paso CATCH	34	35	28†	30†	32*	31*
Sodium in school lunches (goal 600-1000 mg), mg						
Control	1082	1195	1294	1242	1332	1258
El Paso CATCH	1128	1125	1028	1132	1182	1382

*Significant changes from fall semester of third grade.

†Significant changes from fall semester of third grade and El Paso CATCH schools significantly different from control schools.

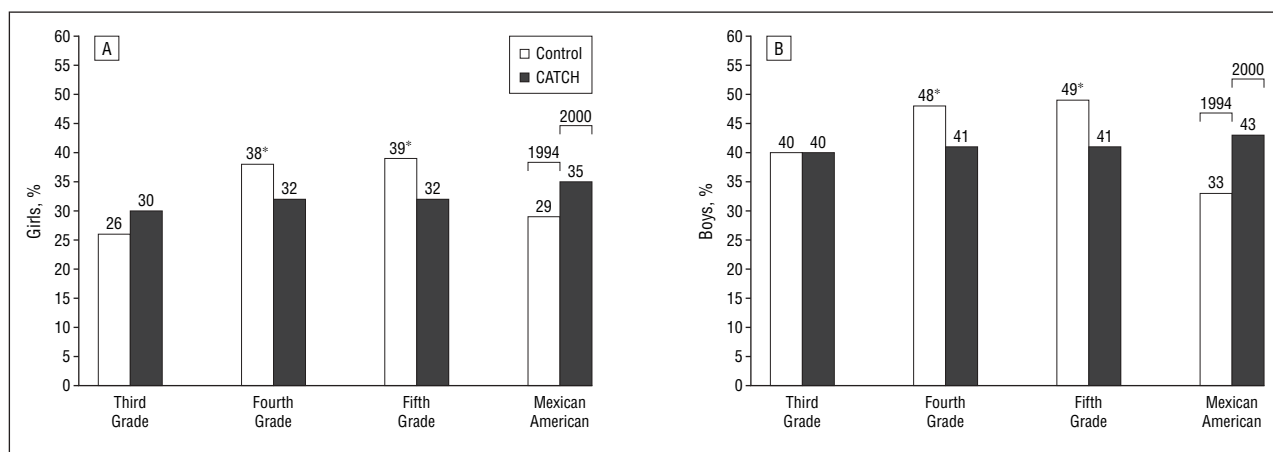


Figure 2. Child health results for the El Paso Coordinated Approach to Child Health (CATCH) program (n=744). Risk of overweight or overweight in control and CATCH girls (A) and boys (B) as defined by a body mass index in the 85th percentile or higher on newest Centers for Disease Control and Prevention growth charts⁵³ across third through fifth grades. Asterisk indicates significant changes from third to fifth grades.

PRIMARY OUTCOMES

Risk of Overweight or Overweight

Results for percentage of risk of overweight or overweight are shown in **Figure 2A** and B. Girls in control schools had significant increases in percentage of risk of overweight or overweight from third to fifth grades, as did girls in El Paso CATCH schools; however, the rate of increase for girls in El Paso CATCH schools was only 2% compared with 13% in control girls. The rate of increase in risk of overweight or overweight was significantly greater for girls in El Paso CATCH schools compared with controls. A similar pattern was seen for boys, with a rate of increase for boys in El Paso CATCH schools of 1% compared with 9% for control boys. The rate of increase in risk of overweight or overweight was significantly greater for boys in El Paso CATCH schools compared with controls. For the third, fourth, and fifth grades, the percentage of overweight in girls did not change or vary between El Paso CATCH and control groups

throughout the study (control, 17%, 18%, and 18%, and CATCH, 13%, 14%, and 15%, respectively), but it significantly increased in boys for both El Paso CATCH and control groups (control, 23%, 29%, and 31%, and CATCH, 22%, 27%, and 27%, respectively). The rate of increase was 8% in 2 years for boys in control schools and 5% in 2 years for boys in El Paso CATCH schools, with no difference between El Paso CATCH and control school boys.

Anthropometry

There was no effect of El Paso CATCH on height, weight, waist-to-hip ratio, or BMI for any children in the study. All children had increases in height, weight, and BMI and decreases in waist-to-hip ratio from year to year.

Aerobic Fitness

Findings for the 9-minute run are given in Table 2. El Paso CATCH and control schools had the same rates of passing in third grade; however, control schools had

higher rates of passing than CATCH schools in fourth grade. This effect was especially pronounced for girls in control schools compared with girls in El Paso CATCH schools. Children in El Paso CATCH schools had higher passing rates than children in control schools in fifth grade, with both groups of schools having the same rates of passing in sixth grade (data not shown).

PE OUTCOMES

The PE outcomes are given in Table 3. In the spring semester of the third grade and the fall semester of the fourth grade, CATCH schools had higher MVPA compared with control schools. However, control and CATCH schools had similar values for MVPA by the end of the fourth grade. This pattern was similar for the fifth grade, with CATCH schools having higher MVPA at the beginning of the fifth grade and control and CATCH schools having similar MVPA by the end of the fifth grade. The pattern for vigorous physical activity (VPA) was somewhat different, with CATCH schools having higher VPA than control schools in the fall of the fourth grade and for both the fall and spring semesters of the fifth grade.

CAFETERIA OUTCOMES

Cafeteria outcomes for school lunch fat are given in Table 3. At the end of the third grade, control and CATCH schools did not differ in the percentage of fat in school lunches; however, at both the beginning and end of the fourth grade, CATCH schools had a lower percentage of fat than control schools. This difference disappeared by the beginning of the fifth grade and was also not apparent at the end of the fifth grade. The CATCH schools met program goals for fat content in school lunches during the second year of the program. At no time did control schools meet program goals for fat content in school lunches. Lunch sodium ranged from 1078 mg in the third grade to 1317 mg in the fifth grade for control schools and from 1037 mg in the third grade to 1371 mg in the fifth grade for CATCH schools. At no time did any of the schools reach programmatic sodium recommendations of 600 to 1000 mg per meal; however, CATCH schools were close to this guideline for most semesters of the program.

COMMENT

The El Paso CATCH intervention successfully slowed the epidemic increase in risk of overweight or overweight seen in control school children. Children in El Paso CATCH schools began the program with rates of risk of overweight or overweight higher than the national rates for Hispanic children (Figure 2A and B) and ended the program below national rates for Hispanic children.⁴ In contrast, children in comparison control schools ended the study period with rates of risk of overweight or overweight that were higher than national rates for Hispanic children.⁴ This study provides evidence for the success and importance of translating evidence-based interventions into community-based programs for prevention of increasing child risk of overweight.

Of the many school-based interventions aimed at promoting healthy behaviors in the last 15 years,^{23-29,53,54} few have had an impact on children's health other than self-reported health behaviors. Planet Health²³ showed a significant reduction in rates of risk of overweight for girls but not for boys compared with control participants and no effects for Hispanic children owing to insufficient sample sizes. Several have had a positive impact on aerobic fitness, including Project Fitness and Bone,⁵³ the Physical Activity and Teenage Health Program,⁵⁴ and Sports, Play, and Active Recreation for Kids.²⁶ For the most part, these were all programs tested in controlled field environments, and schools did not modify curricula or procedures to meet their needs.

The national CATCH project was one of the most successful school health programs with respect to implementation and later dissemination³¹; however, efficacy in influencing overweight outcomes was not found in the original study.^{32,55} There may be many reasons why the El Paso CATCH program was successful in this regard. The sample for El Paso CATCH was predominantly Hispanic (93%) and all low income, targeting a population with some of the worst rates of overweight and inactivity in the nation.^{4,6-14} Although the socioeconomic status of the national CATCH schools was not reported, the site samples ranged from a low of 1.5% to a high of 38% Hispanic. Our findings might reflect a sample of children with a much higher risk of overweight⁵⁶ and schools much more responsive to intervention in light of limited community and school resources for nutrition and physical activity.³⁷

In addition to the differences in samples, the El Paso CATCH program was an effectiveness trial, not an efficacy trial like the national program. The national CATCH was a clinical outcome trial that emphasized intervention fidelity and research control.^{32,57,58} These concepts refer to the importance of adherence to a research protocol and the implementation of all components of a program, including all lessons of a curriculum, attendance at all training sessions, and presentation of only the information in the program. The El Paso CATCH program was designed to use the framework of the national CATCH for translation and institutionalization.^{31,37} This approach differed substantially from the national trial in that schools were encouraged to change the program to fit their specific needs, and thus much of the original program was not implemented as intended.

In addition, the evaluation component of El Paso CATCH was slightly different from the national trial in that all schools, regardless of their status as control or intervention, received the results of the evaluation for third grade at the beginning of the fourth grade fall semester. This was done to control for information and attention effects widely reported in behavioral clinical studies.^{59,60} The national trial had an evaluation-only control group.³² This feedback effect, although well supported in individually focused behavior change studies⁶¹ and in the health system's quality improvement literature,^{62,63} has not been demonstrated previously for community-based health interventions. This has implications for future work with communities: feedback may have an important independent effect on an institution's motivation to change its health practices.

The reasons that El Paso CATCH was successful in changing school health are also the same reasons why it cannot be said that the program definitively caused the changes in child risk of overweight. There could be many explanations for the changes seen, such as the intervention schools having better infrastructure for change than control schools, parents in intervention schools being different in their health practices than parents in control schools, or inherent differences between intervention and control school children related to risk of overweight. In addition, El Paso CATCH did not change rates of overweight. A stronger intervention may be needed to result in weight loss in overweight children, such as increases in VPA to at least 20% or control of snack foods and beverages on campus. It is possible that a school-based program is too diffuse to affect body weight and that individually tailored intervention efforts are better suited to overweight children.

CONCLUSIONS

The translation of the national CATCH materials to a low-income Hispanic community successfully slowed the epidemic increase in risk of overweight or overweight seen in children not exposed to the program. Key components of the success of this translation were an evidence-based approach to study design, tailoring the protocol for program flexibility to meet local resources, communitywide funding and infrastructure support, and quality control program feedback to participating agencies and schools. We suggest that an emphasis should be placed on community institutionalization and evaluation feedback when translating evidence-based health research to low-income minority communities. In addition, coordinated school health interventions for these communities may be more successful if they not only are classroom curriculum based but also include community development strategies, such as coalition building, concrete activities, fund raising, and social support through training.⁶⁴

Accepted for Publication: September 30, 2004.

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Funding/Support: This work was funded by the Patient Care and Outcomes Research Grant program from the American Heart Association, Dallas, Tex (9970182N).

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