

Title of Intervention and Website: The Child and Adolescent Trial for Cardiovascular Health (CATCH)
<http://www.childtrends.org/Lifecourse/programs/ChildandAdolesentTrialforCardiovascularHealth.htm>
http://www.epi.umn.edu/cyhp/r_catch.htm

Intervention Strategies: Group Education, Supportive Relationships, Campaigns and Promotions

Purpose of the Intervention: To test the effectiveness of a collaborative, school-based, heart health promotion program for public elementary school students

Population: 3rd-5th grade students

Setting: Urban public schools in San Diego, California; Austin, Texas; Minneapolis, Minnesota; New Orleans, Louisiana; school-based, home-based

Partners: School administrators, classroom teachers, physical education teachers, food service workers, parents

Intervention Description: The goals of the program were to change known heart disease risk behaviors towards lower dietary intake of fat and sodium, increased levels of moderate to vigorous physical activity and abstention from tobacco use. Schools were randomly assigned to one of three study conditions: usual health curriculum (control), school-based CATCH interventions only, or school-based CATCH interventions and the family program.

- Group Education:
 - *Eat Smart School Nutrition Program* was a program to improve the nutritional quality of school meals focused on menu planning, food purchasing, food preparation and program promotion within schools. The goal of the Eat Smart program was to decrease total fat, saturated fatty acids and sodium in school meals, while maintaining caloric adequacy and meeting all requirements for reimbursable meals as specified by the USDA national School Lunch and School Breakfast programs. Food service personnel participated in a 1-day training session at the beginning of each school year and a mid-year refresher course.
 - *Physical Education* was a program to increase moderate to vigorous physical activities in physical education programming while promoting children's enjoyment of the activity and providing skills to be used out of school and throughout life. Teachers were to engage students in moderate to vigorous activity during at least 40% of the physical education class period
 - *Classroom Curricula* included programs to improve eating and exercise and to prevent tobacco use. Third graders participated in teacher-led, classroom curriculum which focused on healthy eating and physical activity and involved skills training, modeling of healthy behaviors by cartoon characters, and food preparation. Fourth and fifth graders participated in teacher-led, classroom curriculum focused on nutrition and physical activity which involved: monitoring of behavior, goal-setting, skills training, healthy foods and activities. Fifth graders also participated in teacher- and peer-led classroom curriculum focused on tobacco use prevention, this involved: adverse effects of tobacco use, benefits of non-use, and social skills training
- Supportive Relationships:
 - *Family Programs* reinforced the concepts, activities and skills of the classroom curriculum at home. The format was a "take-home" packet of learning materials and activities to be completed jointly by the child and a parent or adult figure in the home; Hearty heart Home Team (3rd grade – six weekly activity packets), Stowaway to Planet Strongheart (4th grade – six weekly activity packets), Health Trek...The Journey Continues (5th grade – four weekly activity packets), The Unpuffables (end of 5th grade – four weekly activity packets about smoking). Packets contained grade-appropriate stories to be read by all household members followed by a series of activities to be completed at home: healthy recipes, family physical activities, myths about smoking, games, and goal setting; refrigerator tip sheets and magnets had summaries of healthy diets and activities to complete. Participation in home curricula was encouraged by incentives (pencils, certificates, memo pads)
- Campaigns and Promotions:

- *Family Fun Nights*: Hearty's Party and Strongheart Celebration were held to raise awareness of the goals and skills contained in CATCH in a relaxed and fun environment; family fun nights consisted of dance performances by the students, food booths with healthy snacks, distribution of recipes, and games.

Theory: Social cognitive theory; Diffusion of innovation

Resources Required:

- Staff/Volunteers: principals, food service staff, classroom teachers, nutritionists, physical education specialists
- Training: sessions with administrators, teachers, and food personnel stressing the importance of compliant implementation; CATCH Physical Activity measurement Manual was used to train CATCH staff in data collection
- Technology: Nutrition Data System
- Space: classroom and gym space for activities, space in school for Family Fun Nights, training space
- Budget: not mentioned
- Intervention:
 - *Eat Smart School Nutrition Program*: School Meal Program Guide, Fat and Sodium Criteria for recipes, ingredients, and vendor product handbooks, Recipe File Box, Vendor Product Handbook, Eat Smart Newslines (a progress report and intervention guide sent out regularly to each school), intervention posters, training models, table tents, menu messages, bulletin boards, CATCH tips, nutritionists
 - *Physical Education*: equipment, CATCH PE Guidebook, Activity Box (file of activity cards with recommended physical activities), supplementary materials, videotapes
 - *Classroom Curricula*: project manual, curriculum guides, resource files; Hearty Heart and Friends (3rd grade curriculum), GO for Health curricula (4th and 5th grade curriculum), FACTS for 5 (5th grade tobacco use prevention curriculum), workbooks
 - *Family Programs*: family activity packets, supplies for family fun night (food, materials for activities, games, time, tables, staff), rewards for finished packets
- Evaluation:
 - *Eat Smart School Nutrition Program*: Guideline Checklists, Visit Summary Form, Promotional Activities Form, Menu Nutrient Analysis, attendance sheets for training sessions; Food Service Knowledge Questionnaire, School Staff Questionnaire, School Staff Tracking Form, Food Service Secular Trends Questionnaire, 24 hour dietary recall materials; monthly school meal participation and student demographics at each school
 - *Physical Education*: School Staff Questionnaire; Injury Monitoring Form; System for Observing Fitness Instruction Time, SOFIT; Physical Activity Record of Classes, PARC; self-administered physical activity checklist, SA-PAC; Lesson Observation Checklist; CATCH PE Debriefing Form; blood pressure cuff; Lange calipers; portable stadiometer; balance scale; watch, blood cholesterol measurement tools (finger prick); Attendance Forms, Visit Documentation Logs; teachers' self-report and observation of classroom or physical education sessions; average daily attendance per month
 - *Classroom Curricula*: Classroom Weekly Checklist; Classroom Observation Form; Teacher's Weekly Checklist; School Staff Questionnaire; Attendance Forms, Visit Documentation Logs; teachers' self-report and observation of classroom or physical education sessions; average daily attendance per month
 - *Family Programs*: Attendance sheets for Family Fun Night event; Home Team Scorecards; list of activities offered at Family Fun Night; teachers' assessments of the likelihood of teaching the home curricula if they were not required to do so; Health Behavior Questionnaire

Evaluation:

- Design: Randomized controlled trial
- Methods and Measures: Attendance Forms and Visit Documentation Logs were used to track training attendance by school staff and support of school staff. Teachers' self-report and observation of classroom or physical education sessions was used to track fidelity and dose of intervention activities.

Average daily attendance per month was documented. Student demographics at each school was abstracted from school records. A Health Behavior Questionnaire was administered. The following evaluation components were also conducted:

- *Eat Smart School Nutrition Program:*
 - Guideline Checklists documented whether guidelines to lower fat and sodium of targeted menu items were adopted.
 - Visit Summary Form documented the purpose and all actions taken during visits to the intervention school by CATCH staff.
 - Promotional Activities Form documented monthly activities sponsored by the food services to promote the Eat Smart program.
 - Menu Nutrient Analysis process analyzed the menu and recipes – a week’s worth of breakfast and lunch menus were collected and analyzed at baseline, midpoint of the trial, and at the end of the trial. Fidelity was measured by the average percentage of fat, sodium and cholesterol in the school lunches.
 - School Meal Participation was calculated monthly.
 - Self-administered Food Service Knowledge Questionnaire assessed change in knowledge of food service staff as a result of training session.
 - Self-administered School Staff Questionnaire assessed service staff characteristics and confidence in their ability to implement the program, completed each of the three intervention years.
 - School Staff Tracking Form was used to document staff turnover rates which are a measure of the stability of the food service staff and may be related to the extent and quality with which Eat Smart program activities are implemented in a school.
 - Food Service Secular Trends Questionnaire collected data on the existence of food service programs that were implemented independently of CATCH but may have had an effect on CATCH outcomes in both intervention and control schools.
 - 24-hour food recalls were conducted at baseline and follow-up to measure dietary intake.
 - Participation was measured by average percentage of supervisors, managers and cooks who attended training during each year of the study.
 - The average number of Eat Smart promotional activities was documented each year.
 - Compatibility was measured by perceived importance of and support for CATCH dietary goals and confidence in ability to implement the program
- *CATCH Physical Education:*
 - Participation in training was measured by average percentage of physical education specialists and classroom teachers who attended training at each grade level.
 - Injury Monitoring Form, Student Registration Form, and School Meal Participation Worksheet provided information on student characteristics.
 - Self-administered School Staff Questionnaire assessed physical education teacher characteristics and confidence in their ability to implement the program, completed each of three intervention years - items included personal characteristics and confidence scales specific to implementing CATCH PE.
 - System for Observing Fitness Instruction Time, SOFIT, included random observations of physical education sessions to evaluate amount of time children spent in moderate to vigorous physical activity and to assess the lesson context of physical education classes.
 - Physical Activity Record of Classes, PARC, tracked the number of minutes of opportunities for physical activity during the school day (completed everyday by classroom teachers for 2 weeks each semester over the 3 years of the intervention.
 - Lesson Observation Checklist was completed by trained observers looking for important characteristics of a CATCH PE lesson.
 - CATCH PE Debriefing Form assessed teachers’ perceptions of and satisfaction with CATCH PE components.
 - Individual level measures included: nine-minute run for cardiorespiratory fitness; self-administered physical activity checklist, SA-PAC, to measure number of minutes spent

- engaged in physical activities versus sedentary pursuits throughout a given day; blood pressure; height; weight; skinfold thickness.
- *Classroom Curricula:*
 - Participation was measured by the percentage of classroom teachers who attended the training sessions for each curriculum
 - Teacher Weekly Checklist for teachers recorded which activities/lessons were completed, which were done without modification and the number of students present during each classroom session.
 - Self-administered School Staff Questionnaire assessed teacher characteristics and confidence in their ability to implement the program, completed each of three intervention years - items included personal characteristics and confidence scales specific to teaching the classroom curriculum.
 - Classroom Observation Form measured the percentage of session-specific activities that were implemented.
 - School Health Questionnaire completed by principals documented external and competing programs or activities that may mimic CATCH interventions and also revealed information about school health policies (e.g. number of minutes of Physical Education provided weekly).
- *Family Programs:*
 - Attendance by students and their families was recorded at the Family Fun Night event to calculate percentage of teachers and students attending the Family Fun Night and household member-to-student ratio at Family Fun Night.
 - Home Team Scorecards measured involvement by students and their families in the family intervention component.
 - Percentage of intervention schools holding a Family Fun Night was documented.
 - Percentage of students participating in the home curricula was documented.
 - Percentage of specified activities offered at Family Fun Night was documented.
 - Percentage of returned cards in which an adult family member participated in the home curriculum and the percentage of family program activities completed by the teachers was documented.
 - Teachers' assessments of the likelihood of teaching the home curricula if they were not required to do so was recorded.
 - The Health Behavior Questionnaire evaluated factors associated with diet and exercise including psychosocial data on dietary knowledge, intentions, usual food choices, social reinforcement and support and self-efficacy.
 - Total cholesterol was measured at baseline and during the fifth grade via venipuncture.

Outcomes:

- Short term Impact:
 - High participation rates (100% of schools asked agreed to participate - 86% of cooks, 78% of food service managers, 94% of PE teachers, and 87% of classroom teachers in the intervention schools attended the training sessions).
 - Teachers reported teaching 95% of curriculum sessions, 69% of students participated in the home curricula each year.
 - High compatibility: school food service staff, physical education specialists and teacher all regarded CATCH dietary goals as extremely important, were supportive of the CATCH intervention, reported a high level of confidence in being able to implement the programs and believed them to be effective in changing behavior. Teachers were likely to teach the CATCH curricula even if not required as part of the study.
 - The intervention was effective with Caucasians, African-Americans, and Hispanics; boys and girls; and across four regional areas.
 - *Eat Smart School Nutrition Program:*
 - There was a significant average reduction in the percentage of calories from and absolute amounts of total fat and saturated fat in the intervention schools compared with control schools from baseline to follow up. These same categories were significantly reduced in the students' self-reported dietary intake.

- There was a significantly lower increase in average sodium content of school lunches.
- A significant increase in potassium was seen in the intervention school lunches compared with the control schools.
- There were no significant differences over time for total amounts of cholesterol, carbohydrate, protein, dietary fiber, total sugars, calcium, iron, vitamin A value and vitamin C, but the average percentage of calories from carbohydrates and protein, and average amounts of dietary fiber, calcium, and iron relative to calories increased significantly more from baseline to follow-up intervention compared with control schools.
- Recommended amounts of calories and essential nutrients as well as high levels of student participation were maintained.
- *CATCH Physical Education:*
 - Measures for body size (height, weight, body mass index, skinfolds) did not differ between the intervention and control groups.
 - There was no significant difference between intervention schools and control schools for total blood cholesterol.
 - There were significantly increased levels of moderate to vigorous physical activity and energy expenditure during physical education sessions.
 - Children in the intervention schools engaged in more moderate to vigorous physical activity and had a higher estimated energy expenditure and a higher energy expenditure rate per lesson than children in control schools.
 - Children in the intervention schools reported engaging in significantly more vigorous physical activity minutes per day than controls.
 - Significant increases in self-reported physical activity, self-efficacy to perform physical activity, positive support of physical activity and parental reinforcement of physical activity were observed.
- *Classroom Curricula:*
 - Teachers implemented lessons that highly conformed to CATCH objectives.
 - Lessons in the intervention schools were significantly higher on the following five characteristics: students were encouraged to be physically active, half or more of the class was engaged in moderate to vigorous physical activity for at least 40% of class time, lessons had an adequate child-to-equipment ratio, the lesson included a warm-up, the lesson included a cool down.
 - Significant increases in dietary knowledge, intention to eat healthier, social support, friend, teacher and parent support for eating healthier were all observed.
- *Family Programs:*
 - Positive support for physical activity and reinforcement of food choice by parents increased as the extent of the adult participation increased.
 - Dietary knowledge was the only measure that increased more among students in the school-plus-family intervention than in the school-only program.
 - Addition of family component to the school component did not result in significant differences between the two intervention groups in nutrient changes between baseline and follow-up.
 - 8 of 11 attitude and knowledge measures in the health behavior questionnaire increased.
- Long Term Impact: not mentioned

Maintenance: The study was designed with diffusion of innovation in mind so that it could be easily adopted and institutionalized by other schools. The CATCH cohort was followed, without further intervention, through the eighth grade: twenty-four-hour recall interviews were conducted with a sub-sample of the cohort to evaluate the stability of the nutrient level change and food behavior change. High participation rates, favorable reviews by parents and added efficacy are sufficient cause for long term support of these programs.

Lessons Learned: It is believed that additional sodium was used to make up for the loss of flavor due to the reductions in fat and this is why no reduction in sodium in the school lunches was observed. It is believed that the high participation rates were a result of the limited requirements of time necessary and that a more

intensive intervention would have had lower participation rates. Preliminary findings seem to indicate that school-based programs in conjunction with home-based programs can produce significant improvements in intentions, knowledge, choices, social reinforcement, and self-efficacy related to food but only modest improvements related to exercise.

Citation(s):

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