An Examination of Childhood Obesity Programs that Incorporate Family Engagement During School and After-School Hours

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Introduction

Childhood obesity has become an epidemic in the United States (U.S.) as one in three U.S. children and adolescents are overweight or obese; topping drug abuse (36). Childhood obesity is now the number one U.S. health concern. According to the Centers for Disease Control and Prevention (CDC), for example, in the past thirty years obesity has nearly doubled in children and quadrupled in adolescents—twenty years ago, 7% of children aged 6-11 were obese, and in 2012, nearly 18% of children were obese. Moreover, youth aged 12-19 years in 1980 accounted for 5% obesity rates, and now obesity rates have increased to 18%. Defined by the CDC, being overweight is “having excess body weight for a particular height from fat, muscle, bone, water, or a combination of these factors.” Obesity is defined as “having excess body fat” (2). If the child is at or above the 95th percentile for BMI for age, the child is considered obese. If the child is between the 85th to 95th percentile for age, the child is overweight (1). Becoming overweight or obese is a direct result from increased caloric intake; when energy intake exceeds energy expenditure. Indirect factors such as increased portion size, excessive sugar intake by soft drinks, and a decline in physical activity heavily influence the rising rates in childhood obesity (4, p. 1). Children and adolescents of low socioeconomic status (SES) are at an increased obesity risk (30) as well as African American, Latino, and Mexican-American children (28, 3,11, 40).

Over 300,000 deaths per year are a result of unhealthy weight gain due to poor diet and lack of exercise (20). As Dehghan, Danesh, and Merchant state in Childhood Obesity, Prevalence, and Prevention, childhood obesity can lead to detrimental outcomes influencing both
physical and psychological health. This illness can lead to abnormal glucose tolerance, hypertension, infertility, and hyperlipidaemia. Also, psychological disorders such as depression are more common among obese children. The factors that play important roles in the increase in obesity include genetic factors, environmental factors, lifestyle preferences, and cultural environment (9). There is evidence that overweight children are much more likely to develop into overweight adults. Since approximately 50% of adults are overweight in many countries and it is known that losing excessive weight is quite difficult, children should be the top priority for education on health, physical activity, and prevention for obesity. Prevention and education are the key strategies for controlling the current epidemic of obesity. Targeting prevention can be conducted by a variety of methods including health and nutrition education, promoting physical activity, and providing a safe and sufficient environment that has accessibility to healthy foods (9, p. 1-3).

The individual is the ultimate objective of healthy behavior changes, but the family is the immediate avenue for health enlightenment and education because food behaviors and exercise routines are learned and practiced in the home. Research advises that education about healthy eating and routine exercise should begin early in one’s life. Home environments along with school environments are among the most influential avenues to implement healthy, long-term dietary and physically active behaviors (39, p.355). Parents are the policy makers in the home. They dictate the child’s everyday decisions on food availability, food choices, and recreational opportunities. Since they play a major role in influencing a child’s eating and physical activity behaviors by rewarding and reinforcing specific habits, they should be actively involved and educated on the detrimental effects of childhood obesity. If children are given particular foods repeatedly without being forced to eat them, they will eventually become part of the diet even if
initially rejected. Encouraging children to stop eating when they are full and teaching children reasonable portion sizes should be taught in the home at an early age (17). Studies show that when families eat together, they are more likely to consume vegetables, grains, fruits, and calcium-rich foods. Concerning physical activity, children are less physically active than they were in past generations and so parents need to strongly enforce and encourage athletic activities, outside play, and daily lifestyle routines (e.g. walking to the grocery store). It is imperative that parents are good role models and major advocates in promoting healthy eating behaviors and regular physical activities for the children (17). Parents can be effective supporters by being involved in both school and community programs to promote these behaviors.

Interventions focused around parental influence can be developed in many settings, but the school setting is a dominant setting for health promotion (10). According to Healthy Eating Research (HER), more than 54 million U.S. children and adolescents attend school, and 8.4 million of these attend after-school programs located in schools, parks, and recreational centers. Clearly, a considerable amount of the children's caloric intake occurs at school and at after-school programs and so implementing healthier nutrition and physical activity policies at school can help prevent childhood obesity (36). Each day, approximately 28 million students take part in the National School Lunch Program and about 8 million students participate in the National School Breakfast Program. Schools must be sure that the food served in cafeterias is regulated by the United States Department of Agriculture (U.S.D.A) nutritional standards (13). All food and beverages served or sold to youth in schools should be nutritious and energy dense, however most “competitive foods” (foods and beverages that are not part of the federal school meal programs) sold in cafeterias are higher in calorie content and fat and low in nutrients. Federal standards must be revised for the regulation and distribution of these unhealthy “competitive
foods,” as only 21 states have policies that restrict competitive foods (19). Regarding physical activity, many schools around the nation have reduced the requirement for regular and adequate physical activity for the students. From a 2000 person survey, it was found that only 8% of elementary schools, 6.4% percent of middle/junior high schools and 5.8% of senior high schools provided daily physical education (PE) for the entire school year for all of the students (19). It is imperative that students obtain at least 30 minutes of moderate to vigorous exercise and this goal can be achieved by implementing interscholastic and intramural sports programs, PE clubs, and lessons that meet the interests of the students. If taken advantage of, schools can play a critical role by providing a supportive and safe environment that implements policies to support healthy behaviors (19). They can provide the opportunities to educate students about healthy eating and the importance of physical activity (4). Studies have already shown that an avenue to this health education is successful in in-school, after-school, and at-home education and prevention programs. This essay will focus specifically on the role and impact of in-school, after-school, and at-home nutrition education and physical activity programs that incorporate parental/guardian involvement to prevent and control childhood obesity.

Research shows that life-long health benefits result in behavior change when nutrition and physical activity programs are combined with consistent family support. The MEND “Mind, Exercise, Nutrition, Do It!” program is an example of a successful, family-oriented health program. The ten-week program, consisting of 20 two-hour sessions, involves the entire family which offers solutions to encourage long-term changes for children and adults to live a healthier and happier life. Each week when the families meet, the curriculum includes taking weight and height measurements and the first hour consists of a nutrition lesson for the family that focuses on customizing healthy eating to fit one’s needs and preferences and the second hour is broken
into non-competitive, group play exercise activities for the kids while the parents receive theoretical and behavioral lessons based on goals and rewards, stimulus control, and positive parenting. The “Do It” portion of the program emphasizes putting the received nutrition education and physical activity into practice every day. The main goal of this program is to modify the behaviors that cause obesity of children aged 7-13 years. From a ten-year evidence base and 20-year international research partnership, 80% of participants reduced or maintained their BMI, 79% returned to the 7-13 year old program, and there are 300+ MEND program locations around the globe each year (27). MEND programs are one of the world’s largest evidence-based healthy lifestyle programs that empower children and their families to reach a healthy weight and teach them how to maintain that weight. It is currently located in diverse areas in Canada, United Kingdom and it is implemented in seven states in the US and is partnered with YMCAs and other similar programs (27).

**Sponsored Program: Cooking Matters**

The first program to be highlighted is Cooking Matters, the nation-wide non-profit organization that I was involved with during the Spring of 2013. There are a number of different programs options to best suit the participant: Cooking Matters for Adults, Cooking Matters for Families, Teens, Kids, Child Care Professionals, Cooking Matters At the Store for Adults, and/or Cooking Matters At the Store for WIC Parents. I volunteered with Cooking Matters for Families. Cooking Matters research shows that 85% of low-income parents say that eating healthy meals is important to their families. Eight in 10 families make dinner at home at least five times a week. Low-income families typically make their meals from scratch and on other nights, easy-to-prepare packaged foods are used. 61% of low-income families are making dinner from scratch
most days of the week. Families view cost as the primary barrier to healthy eating and only 30% of the low-income families are satisfied with price of the food (20). 85% of families do not buy healthy foods at the grocery store due to price of the item. Fresh produce is not bought most often. One in two low-income families are interested in tips and education tools to cook and eat healthier meals (20).

Founded in 1993, Cooking Matters has been successful for 20 years in empowering families with the skills set needed to cook healthy meals at an affordable cost. More than 120,000 low-income families around the United States have been helped and educated by being involved with this program. Cooking Matters was founded by Share Our Strength based upon a collaboration of Share Our Strength and local program partners to maximize all of the factors involved. The program has been featured by First Lady Michelle Obama’s “Let’s Move!” Campaign and it has also been recognized by the U.S. Department of Agriculture for its excellent teaching in nutrition education (7). Walmart and ConAgra Foods Foundation now sponsor Cooking Matters. While Share Our Strength provides training, evaluation, nation-wide support, professional curricula, and instructional materials, it needs the local program partners to help in providing accessible, hands-on, fundamental resources and firm relationships on the local level in order to be successful. Families using public nutrition programs like Supplemental Nutrition Assistance Program (SNAP), more commonly known as food stamps, and Women, Infants, and Children (WIC) participants learn how to maximize the benefits they receive through Cooking Matters. It has also made a tremendous impact on the participants. For example, the graduates reported: 63% of them intend to read ingredient lists to find whole grains, 58% aim to compare food labels to make healthy choices, 58% intend to compare unit prices to find the best deal, 88% of WIC (Woman, Infants and Children) parent graduates are very or completely confident
in their ability to make the most of the WIC fruit and vegetable vouchers and 85% of WIC parent graduates are very or completely confident in their ability to identify WIC foods at the grocery store (5). Participants in cooking matters vary from moms, dads, grandparents, caregivers, teens, and children. Volunteers consist of chefs, students, Registered Dietitians, and people who want to help others learn how to cook. 98% of the volunteers say that they would teach another course (7). Staff members include experienced chefs, Registered Dietitians, nutrition educators, public health professionals, and campaign strategists.

This six-week after-school program aims to Share Our Strength’s No Kid Hungry campaign (in order to end childhood hunger in America) which provides children in need with nutrition education and cooking classes for the families. Once a week, a different nutrition lesson is taught and two new recipes are prepared that are nutritious and affordable for the families. This is an extremely interactive program, as Cooking Matters volunteers and staff members help to cook the meals alongside the parents and children. Each family is given their own cookbook with nutrition lessons and healthy recipes. Every week, a grocery bag full of nutrient-dense food to cook is given to the families, containing the ingredients to cook the meals that were prepared in class that week.

Grocery store tours called “Cooking Matters at the Store” are also a component of the program. Families go to the local grocery store and are taught how to strategically shop for nutrient-dense foods at a reasonable price. During the 1.5 hour-tour, four food skills are taught: 1) reading food labels 2) comparing unit prices 3) finding whole grain foods 4) identifying three ways to purchase produce. These tactics enable them to shop smarter, read nutrition information to make healthier purchases, and how to properly prepare various meals. At the end of the tour, the families are given a $10 challenge where they are to use their newly acquired skills to find a
healthy meal for a family of four for under $10 (5). Along with the $10 meal that they find, they take home a reusable grocery bag and shopping tip booklet. Another component of the program are the education tools provided. These include free toolkits, recipes, and kids’ handouts which are all available at CookingMatters.org. There is also a smartphone app, Cooking Matters, where the education tools can be located. The education tools include “Cooking Matters in Your Community,” “Cooking Matters for Chefs and Kids,” and “Exploring Food Together.” Over 192,000 toolkits were distributed (7).

From the Annual Review 2012, the programs doubled the number of participants year-over-year, with a total of 32,832 participants; 2,000 new volunteers were added; 45 states and the District of Columbia held the classes and the grocery store tours; There were 23,236 course participants and 9,596 grocery store tour participants (6). Specifically for the Cooking Matters for Families, 97% of children liked cooking with their parents in class; 36% more often do families make meals with at least 3 food groups; and on average, family graduates prepare meals together 67% more often (6).

**Literature Review Methodology**

Articles incorporated into this essay were found by using the keywords, childhood obesity, after-school nutrition programs, after-school physical activity programs, coordinated school health programs, parental involvement in school-based health programs, families and nutrition, and health. Six articles that evaluate childhood obesity prevention programs which incorporate nutrition and/or physical activity and family engagement were found through Pubmed and the Journal of Hunger and Environmental Nutrition.
Parent-Child Nutrition and Physical Activity Integrated Programs

Kids Nutrition and Fitness Program

Coordinated school health programs (CSHP) can help to decrease childhood obesity as they incorporate parental, school, and home-based components. A CSHP called “The Kids Nutrition and Fitness Program” (KNF) was a parallel-group, randomized controlled trial that sampled 251 predominantly Mexican-American children aged 8-12 years from low-income based schools in Los Angeles, California. This was a university-community partnership aimed to encourage optimal health in hopes of reducing children’s body mass index (BMI) percentiles and z-scores. Through recruitment at open house, fliers, and letters to parents, five schools were randomly selected and they were similar in gender breakdown, ethnicity, socioeconomic status (SES), and at least 50% of the population was using free/reduced cost meals programs. Children were screened for a BMI greater than the 85th percentile, English or Spanish speaking, and no physical limitations that limited frequent exercise. There were two main components of the program: (1) Kids Nutrition and Fitness, a six-week family oriented after-school program that consisted of weekly 90-minute sessions on physical activity, nutrition education (e.g., nutrition education including food pyramids, fats, sugars, salt, healthy alternatives, healthier lifestyle behavior changes, and examining cooking patterns), and a supportive parental group; and (2) school and community-level environmental activities, including services from local clinics concerning mental and physical health, and also the establishment of a School Health Advisory Council that devised and implemented wellness policies (39 p. 348).

The sample of 251 predominantly Mexican-American children was assigned to a randomized controlled study. Once enrolled, the five schools were randomized to either the KNF
CSHP intervention group (n= 2 schools), or the general education (GE) group (n= 3 schools). Over the one year time span, researchers determined whether parental, school, and at-home components would help to promote healthy eating and an overall reduction of BMI percentiles and z-scores. The KNF CSHP group included the after-school physical activity and nutrition program, and coordinated school health workouts for the school and home. The general education (GE) group performed standard physical activities at their school, but they did not have nutrition lessons or physical education in school-based environmental activities. A $10 grocery store gift card was given to the participating parents and children were given stickers and/or a small toy. Different components were incorporated into this study and examined including dietary behaviors, food preferences, food knowledge, food intentions, and self-efficacy measured by a reliable and valid questionnaire, as well as BMI percentiles and z-scores. This trial had measures at baseline, pre-intervention, and post-intervention at four months and twelve months. At the fourth and twelfth month was when data was collected, during post-intervention. At the twelve-month follow-up, students were asked to report access to fruit at lunch time and to classify the school lunch as “healthy” or not. Focus groups, associated with the Advisory Council, evaluated the level of leadership at the schools in relation to health promotion (39 p. 347-351).

Results were positive at the twelfth month, after giving the children an after-school diet and physical activity exercises to do at home with the family. Of the 305 children who began the KNF program, 251 children (82%) participated in at least half of the sessions. There were 121 children assessed as the baseline in the KNF (n=121) and 130 in the GE group (n=130). Overall for both groups, there were more girls in both groups; the majority of the children were from the fourth grade; and parents who had an education equivalent to an elementary school child and
with an annual income of $0-$15K/year (at or below the poverty level) were most common. The children who were lost in the study tended to be Spanish speakers and they were older. The most significant result was the decrease in BMI and BMI z-scores that endured up to 1 year post intervention. There were significant differences between KNF and the GE groups in comparing BMI scores. For the KNF group, body mass index (BMI) decreased on average by 2.80 kg/m² (p= 0.04) and BMI z-scores on average by 0.48 (p=0.03) between the baseline and 12-month follow-up. The KNF group’s daily intake of vegetables increased on average by 1.51 (p= 0.03) and fruits by 2.00 (P= 0.001), 100% fruit juice intake by 1.12 (p=0.03). Also at the 12-months, there was an average increase of 20.00 (P= 0.02) for “always drinks 100% fruit juice,” and an average increase of 47.14 (p=0.001) for “always eats veggies for dinner.” Knowledge increased of the “5-a-day of fruits and veggies intake” from the food pyramid by 28.02 (p=0.001). Differences in the increases for food intentions were an increase of 3.60 (p=0.05); food knowledge increase of 4.38 (p=0.04); and an increase was seen in self-efficacy of healthy food choices by 1.02 (p=0.03). These were sustained from baseline to the 12-month mark. Parent and community involvement increased and impacted the children tremendously. Parent involvement grew to 100% by the twelfth month, and the by the 12-month follow-up there was 100% participation with the Advisory Committee. Overall, the risk of obesity was reduced in school-aged, Mexican American children who go to low-income schools (39 p. 351-355).

The results of this program suggest that programs like these “supported by community-academic partnerships, which provide a culturally and linguistically appropriate, family focused, obesity prevention program, can be effective in addressing dietary health behaviors and in decreasing BMI and BMI z-scores for at least 1 year (39 p. 353).”
The YMCA Healthy, Fit, and Strong Program

There are many nutrition and physical activity related locations available for adults, but there are fewer for overweight and obese children. The YMCA Healthy, Fit, and Strong Program was designed to make low-cost, community-based, family-centered interventions available for overweight and obese children. From July to October of 2009, 59 children aged 6-11 years with a BMI for age and sex greater than the 85th percentile, without any dietary or activity limitations or serious or chronic medical conditions, and with English speaking parents were recruited to join this program. Children were recruited from medical center clinics, pediatric and family practice offices, schools and churches to four YMCAs in North Carolina. Diversity was prevalent among the study, there were 37 (63%) females; 32 (54%) African Americans, 5 (8%) Hispanics and 22 (38%) whites (35 p. 579). Flyers were dispersed including a $25.00 registration fee that allowed a three month family membership at the YMCA. Families who could not pay were not turned away and a full refund was rewarded if the families remind in the program. Families who completed the program received another free three month membership at the gym (35, p. 578-579).

The program took several measurements and included physical activity and nutrition activities. Measurements of height, weight, and a diet and activity questionnaire took place at three, six, and 12 months and parties were held at each of these appointments to encourage participation. The questionnaire was completed by the parents at 3 and 12 months and it focused on the six behaviors associated with obesity (sugar-sweetened drinks, dining out, fruit and vegetable intake, snacks, physical activity, and TV/screen time) (35 p. 578). Using the CDC website, BMI z-scores and percentiles were determined by age and weight. These measurements
took place at baseline and at three, six, and 12 months. The children’s dietary and beverage intakes and also the amount of time spent being active and being sedentary was recorded by the parents at baseline, 3 months, and 1 year. To observe changes in these measures over the time period, paired t-tests were calculated (35, 579). The goal of the physical activity portion was not to lose weight, but to have fun. It took place for one hour, three times per week at the four YMCA sites and included activities like dodge ball, basketball, soccer, kickball, races, Zumba, hip-hop dancing, and roller skating. To promote parent physical activity alongside their children, “Family nights” were scheduled once weekly. Exercise machines were purposely not incorporated to show that these low-cost activities can be continued at home. After three months, physical activity was decreased to once weekly and at the sixth month, the organized activity ended. Nevertheless, parents were encouraged to promote family activities at home and joining the YMCA could be at a lower fee (35 et al, p. 578-579). Regarding the nutrition portion of the program, only the parents attended to nutrition lessons. They were taught by a local registered dietitian that consisted of 10 interactive weekly sessions for one hour each session. Culturally applicable for Caucasian, African-American, and Latino families, the nutrition lessons were developed by a North Carolina Eat Smart Move More panel of experts. The instructor was provided with an instruction manual that contained key points for discussion, parent handouts and recipes. Each session focused on a different theme, the ten themes were: Plan, shop, fix, and eat (prepare and eat meals at home); Shop for value (read labels); Make smart breakfast and lunch choices; Make smart drink choices; Smart-size portions; Make smart choices when eating fast food; Choose more fruits and vegetables; Move more everyday (increase physical activity); Limit screen time; Choose “MyPlate” (35 p. 579).
Participants had positive results at the end of the program. Concerning feasibility, retention at the four YMCA gyms varied from 45%-100% throughout the 12 months. Combined overall retention of the four sites was 71%. There were no statistically significant differences between who dropped out and those who did not for any of the characteristics. Average attendance among the four sites was 51% for nutrition sessions and 60% for physical activity sessions. BMI z-scores and percentiles were determined according to age and sex using the CDC website and it was measured at baseline and at three, six, and 12 months after the program began. Dietary and beverage intake for the children were recorded by parents as well as the children’s amount of time being active or sedentary at baseline, 3 months, and 1 year. Baseline BMI percentiles for age and sex was between the 85th and 94th percentiles for 8 children (14%), between the 95th and 98th percentiles for 25 (42%) children, and equal or greater than the 99th percentile for 26 children (44%). The median (range) BMI z-score was 2.19 (1.06-3.51). BMI significantly altered over time; the difference from baseline was significant at 3 and 6 months (p= 0.001 and 0.017, respectively), but not at 1 year (35 p. 579). Over the 12-month follow-up period, there was a significant decrease in BMI z-score (-0.15 units) (35 p. 581). Related to the improvement is a change in total cholesterol, triglycerides, low-density lipoprotein cholesterol (LDL-C) and insulin levels (35 p. 581). The number of “fruit” drinks and sodas eaten per day decreased significantly from baseline to three months (95% CI = -0.80, 0.01, p=0.05) and (95% CI = -0.42, -0.02, p=0.03), respectively and 1 year (95% CI = -0.99, -0.08, p=0.02) and (95% CI = -0.88, -0.15, p=0.01) respectively. Physical activity hours at 3 and 12 months (95% CI = 1.00, 6.10, p = 0.01) and (95% CI = 1.2, 6.1, p < 0.01) and servings of fruit per day at 12 months (95% CI = 0.10, 0.72, p= 0.01) increased significantly (35 p. 579). Television viewing (hours/week) decreased significantly at 3 months (95% CI = -4.8, -1.4, p<0.01), but not at 1 year (95% CI = -
3.8, 0.4, p=0.11). Video games decreased significantly at 1 year (95% CI= 3.4, -0.03, p=0.05). Fast food intake (times/week) decreased significantly at 3 months (95% CI= -2.23, -0.37, p=0.01), but not at 1 year (95% CI= -1.79, 0.96, p=0.55). At 3 and 12 months, the parents completed an evaluation of the program. 94% of the parents marked that they would tell other families about the program. Suggestions from the parents included extending the program beyond three months, getting the children involved in the nutrition lesson, and scheduling more family nights (35 p. 580).

Promoting Healthful Diets and Exercise: Efficacy of a 12-Week After-School Program in Urban African Americans: Students and Parents Actively Involved in Being Fit Program

A specific population who are known to be at an increased risk for obesity, cancer, hypertension, and other lifestyle-related diseases are African Americans. Focusing specifically on the African American community alone, nearly 40% of children are overweight or obese. Over 11% of the young African Americans aged two-five are already obese and young African American girls aged 12-19 have the highest prevalence of obesity above any other group by ethnicity, rate, or gender (24).

This study targeted African American children and parents in inner city, middle-school settings. As mentioned in the introduction, it has been shown that African Americans are at an increased risk for obesity, cancer, hypertension, and other lifestyle-related diseases (37). Efficacy of direct parent/guardian participation with the child in a school-based extracurricular health promotion initiative was examined in this program, rather than just relying on children to pass-along this education at home. In this “Students and Parents Actively Involved in Being Fit Program,” middle-school students and their parents/guardians were required to enroll together.
On-site schoolteachers and university-based faculty members with research expertise in nutrition, physiology, and health promotion partnered with community health advocates to lead this initiative. The design of the program consisted of a 12-week long trial, 60 to 75 minute sessions, 4 days each week (10, 455). 56 African-American children (18 male, 38 female) and 25 parents/guardians (all females) enrolled (10, p. 457). For the children, the average age was 11.1 ± 1.3 years and the average weight was 52.3 ± 19.3 kg. The parents/guardians were all female and their average age was 40.0 ± 7.7 years and their average weight was 81.3 ± 21.7 kg. The aim of the program was to increase vegetable and fruit intake and increase physical activity in urban African-American children and their parents/guardians. Pre and post pairwise t tests were used to measure change. There was a variety of cognitive, social, and behavioral strategies included in the program. A schoolteacher was responsible for participant recruitment and daily management of the activities. Activities included sport games, supervised dance (African dance included), step pedometers, 5 A Day for Better Health Program nutrition learning, educational handouts on nutrition and fitness, and a poster board with various health themes at the school. Participants were free to choose which activities they wanted to perform throughout the duration of the program. Home activities and family-fun nights were also incorporated as well as a motivational guest speaker to support the goals of the program. The participants were also asked to track their daily fruit and vegetable intake and the number of steps they took based on their “passport” they were given. The participants were given this special “passport” that waived the cost of the community-use fees for the dance rooms and gymnasium. The dietary component of the program was based off of the 5 A Day for Better Health Program which is from the National Institutes of Health, National Cancer Institute. The schoolteacher taught nutrition from resources from the 5 A Day state coordinator. Existing questionnaire answer choices were coded using a scale of 1-10
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(1= never, 10= 5 or more times per day). At pre and post intervention, body weight, height, and body fat were measured as well as resting heart rate, blood pressure, and a times fitness run/walk test (10, 456). A questionnaire about daily fruit and vegetable intake was assessed.

Results showed that school-based exercise programs suggest that blood pressure can be improved as well as changes in body composition (BMI, body fat) and fitness level. This program benefitted both children and parents. Estimated fruit and vegetable intake levels did not change significantly. The children’s diastolic and systolic blood pressure was reduced (-6.8 mmHg and -10.1 mm Hg) respectively accompanied with a higher level of fruit and vegetable consumption, but without any increased fitness measures (10, 458). Parents/Guardians experienced a decrease in body fat, BMI, and endurance walk/run time. In general, children showed more diet-related improvements and parents showed more health-related fitness benefits. Positive parental encouragement and influence significantly affect lifestyle related health behaviors (10, p. 458).

Effect of Including Parents in a School-Based Exercise and Nutrition Program for Children

Experimenters Hopper, Munoz, and Herb tested whether exercise and nutrition improved if parents were involved in a school-based program. These authors believe that including parents in these nutrition and exercise programs that are low-cost, effective, and easily adopted greatly improve their own and their children’s’ lifestyle from a health standpoint. In their experiment, they designed a six-week program that included a “within-school” component that has proved to increase the understanding of fitness and nutrition fundamentals. In addition, the program included a family participation factor where weekly brochures were given out that suggested ideas for the family to be active together. The experimenters wanted to compare the effect of the
child’s nutrition and exercise behaviors by either encouraging family participation or not. 132 fifth and sixth children were randomly assigned to three varying treatment groups, six fifth and sixth grade classes were randomly divided into one of the treatment conditions. The conditions included: 45 children in the school-and-home condition, 43 students in a school only condition, and 44 students in the control condition. These groups were all similar at pretest. The mean age of the children was 11.6 (SD= .7) years and the mean age of the adults was 37.8 (SD= 6.8). In the school-and-home condition as well as the school-only conditions, in-class nutrition activities and information on exercise habits were administered. There was no additional information or education on nutrition or exercise for the control condition. In the school-and-home condition, nutritional and exercise activities were instructed for the student and the family to participate together at home. Parents with children in the school-and-home condition received a letter and phone call for the program and they were invited to the orientation session. 42 parents participated in the school-and-home treatment condition, 30 of them completed pre- and post-tests. Additionally, 12 more parents completed the home activities (14, p. 316). A total of 24 families participated, 31 mothers and 11 fathers. The following measurements were taken for analysis: weight, height, cholesterol, skinfold, percent calories from fat and carbohydrates, saturated fat, nutrition knowledge and various exercise activities such as sit and reach flexibility, sit-ups, and a timed mile-run. Parents measured at pre and post-test were measured on the same activities except a step test instead of a mile run test. A 20-item multiple-choice test was administered on the knowledge of physical fitness and exercise concepts given to kids and parents. For nutrition measures, a 24-hour dietary recall by interview was used to estimate food intake. A 20-item multiple choice test on knowledge of nutrition concepts were given to both children and parents.
Components and tactics of the program for nutrition education and for encouraging physical activity were strategic and beneficial. For the children in the school-and-home and school-only conditions, there was a physical fitness component that involved a six week regimen of three 40-minute in-school sessions per week. Concepts were combined with the activities (e.g. warm up and cool down, counting the pulse, difference between aerobic and anaerobic activities, how many calories are expended in exercise, evaluating cardiovascular fitness, determining desirable body weight, and how sports can be used for fitness). Activities included educational gymnastics, easy organizational games, and dance (14, p. 317). Nutrition education was given in two 30-minute in-school sessions per week for six weeks for the school-and-home and school-only groups. Reduction of saturated fats in the diet was the overarching topic, but other main focuses included: preparing snacks using vegetable and fruit, meat alternatives, eating high fiber foods and high energy dense foods. Relaying the information included hands-on preparation, role-playing, films, games, and group discussions. Concepts relating to cardiovascular disease were discussed. Children were taught how to discuss nutritional topics with their families (14, p. 317). The family involvement component in the school-and-home group consisted of take-home packets relating to nutrition and exercise habits to share with their families. The packets gave instructions on how to set goals for eating healthier and exercising regularly. Points were given for families who followed recommended recipes, deciding between low fat and high fat foods daily, setting nutritional goals, and completing exercise activities. A scorecard called “Home Team” was completed each week by the family. These scorecards were self-reported. If the cards were not turned into the teacher, a phone call was made to the parents. As a reinforcement tactic, children were given stickers each time they turned in their scorecard and if the weekly point goal was met, a balloon was given to them. If the family was a part of the “Home Team,” they
received t-shirts as well as a certificate and door-prize at the heart-healthy potluck party at the end of the program (14, p. 317).

The results of the program appeared to be beneficial for the participants. They were calculated from a pretest-posttest design measured on twelve variables (some mentioned above). There proved to be a tremendous difference between the groups. Results were calculated on multivariate analysis of variance (MANOVA) followed by pairwise comparisons comparing the three groups on their change. The variables that correlated stronger than .20 with the canonical function were sit-and-reach flexibility (.23), height (.22), exercise knowledge (.68), nutrition knowledge (.46), skin fold (-.31), and percent of calories from fat (-.23). This canonical function shows increases in knowledge of exercise and nutrition concepts, height, sit-and-reach flexibility, and lack of increase in skin fold and percent calories from fat. The pairwise contrasts showed the school-and-home and school-only treatment groups scored significantly higher than the control group a p <.05. The school-and-home group and the school-only group scored significantly higher on posttest exercise knowledge compared to the control group. The groups differed significantly at posttest on percent of calories from fat, with the school-and-home group and school-only group each showing significantly lower percent of calories from fat compared to the control at p<.05. Pretest and posttest data of the parents from the school-and-home data showed that the participating parents improved significantly on the sit-and-reach flexibility test, timed sit-ups, and there was a significant decrease of the amount of saturated fat consumed, all p<.05. Overall, the control group showed the least amount of change compared to the other two groups. The school-and-home group showed a higher mean improvement than the school-only group, but those groups did not differ significantly from each other. When comparing single variables however, the school-and-home group scored significantly higher compared to the control group.
on posttest nutritional knowledge, but the school-only group did not. This provides shows evidence that parental involvement in programs like these is better than solely instructing children at school (14, p. 318-319). Since the skin fold and percent calories from fat correlated negatively with the canonical change function, it supported the main goal of the treatment in reducing the amount of fat in the diet and in the body. It is also optimistic that the parents showed a significant decrease in the amount of saturated fat in their diet. Since the measures correlating most strongly with the canonical change function were exercise and nutrition knowledge, it may suggest that instead of behavioral changes taking place, there was a change in health knowledge (14, p. 319).

**Parent-Child Nutrition Education Only Integrated Programs**

**The Thrifty Food Plan**

There is evidence that low-income households spend up to 50% of their food budget on meat. Since meat, poultry, and seafood are the most expensive items at the store, a plant-based diet will allow for more money available to spend on fruits and vegetables and informing people that a daily intake of meat, poultry, and/or seafood is not necessary to be healthier could encourage more fruit and vegetable purchases. Buying and preparing raw foods and the time and skills required to cook the recipes are expensive and time demanding. These factors have been major barriers for families attempting to eat healthy. A six-week cooking program of plant-based recipes called the Thrifty Food Plan (TFP) in Rhode Island was designed by the Rhode Island Community Food Bank to teach food pantry consumers how to eat healthier on a minimal budget and how to improve food purchases while decreasing food expenditures (12 p. 74).
A total of 85 clients enrolled in the 34-week study, who were from emergency food pantries and low-income housing sites. The program was divided into three periods: Four weeks prior to the cooking class (baseline period); six weeks of cooking class; and six months of follow-up that included one appointment each month. Three to four participants attended the cooking class as they observed the preparation and ate one of the 22 new plant-based recipes, adapted from the Raising the Bar (RTB) on Nutrition program. Averaging 30 minute class periods, the following nutrition lessons were given: health benefits of extra virgin olive oil; the unnecessary use of meat/poultry/seafood and how vegetables contained the needed protein, and how to look for the ingredient used in the food pantry. No additional nutrition or food information was given. Whole grain pasta, brown rice, and canned or frozen vegetables were used (12 p.75-76). Each family left the class with a bag of groceries containing most of the ingredients to make three of the recipes provided. At each of the three study appointments, height and weight were measured. Also, a study questionnaire was given at each appointment assessing current Supplemental Nutrition Assistance Program (SNAP) benefits, current food habits, size of household and ages of each member, race, and any changes from the last appointment. Participants were asked to provide grocery receipts for all foods purchased, which were divided into the three periods of the program. Participants were reimbursed for completing components of the study (e.g. providing grocery receipts, attending meetings, completing study visits) (12, p. 76-77).

Retention rates and ethnic breakdown was examined showing that of the 85 clients enrolled in the 34-week study, 63 participants completed the program. 11 participants completed the protocol by attending the 6-week cooking program, but they did not complete the six months of follow-up. Ten people did not complete the study due lost connection through phone or
moving, and there was one death (n=1, not study related). 12 participants dropped out when the cooking classes were going on. The results given are from the 63 participants who completed the protocol. Baseline data was compared with the data at the appointment following the 6-months of follow-up. 84% of the participants were women, the mean age being 51.8 years. 84% of the participants were unemployed and there was racial diversity (white, n=42, Native American, n=7, African American n=6, Hispanic, n=3, other, n=5). 30 of the participants had children under 18 living in their home. At the baseline, 49 people were benefitted from SNAP and at the follow-up, 48 were receiving SNAP benefits (12, p. 78).

The Thrifty Food Plan was an overall success as this program improved food security, body weight, and food purchases for food pantry clients. The number of meals per week that were plant based increased from the appointment at baseline to follow-up, (0.6 ± 1.1 vs 2.8 ± 1.3; P < .01). This meant that no meat/poultry/seafood were included in the dish. 60% at the follow-up appointment versus 5% at the baseline appointment had 3 or more meals per week prepared from the recipes given. There was also an increase in the variation of fruits and vegetables eaten. For vegetables, the baseline was 8.7 ± 2.6 vs. the follow-up 10.0 ± 1.7 (P < .01); for fruit, percentage began at 5.9 ±2.8 and at the follow-up it was 8.1 ± 2.8 (P < .01); 78% claimed eating more vegetables and 44% reported consuming more fruit. 95% of the 63 participants provided their grocery receipts. 76% of the participants claimed that compared to their own recipes, the recipes provided were easier to cook; 76% said that the Raising the Bar (RTB) recipes took less time to prepare; and 94% responded that they would be using the RTB recipes in the future (12, p. 78). Concerning food security, 68% of the participants used the food pantry at the baseline compared to 54% at the follow-up (P=.11). Food insecurity with hunger decreased. The participants BMI was 33.3 ± 8.5 at the baseline and 32.9 ± 8.4 at the follow-up (P=.05). Average
weight loss was $1.44 \pm 5.36$ kg, as $49\%$ of the participants weighed less than their starting weight. There was also a significant decrease in waist size (baseline $96.2 \pm 16.8$ cm; follow-up $95.3 \pm 16.2$ cm, $P = .05$). Note that the “improvement in body weight was not related to either the improvement in food security ($P = .23$) or the increase in reported meals from the plant-based recipes using olive oil for cooking ($P = .88$)” (12, p.79).

Overall, there was a total decrease in food costs and a decrease of unhealthy food items. The participants felt more secure about accessibility to healthy foods. The average cost of the recipes was $1.07$ per serving (with a range of $0.74$ to $1.37$). These recipes followed a Mediterranean diet pattern, which included extra virgin olive oil in every meal. From this study, one can see that the incorporation of plant-based meals two to three times per week can decrease body weight and can enhance one’s diet by eating a variety of fruits and vegetables. The incorporation of cooking as a family improved nutrition education and reinforced healthy eating. Teaching children at a young age about nutrition and diet and instilling healthy eating behaviors can help to solve and prevent the obesity epidemic.

Eat Well, Eat Local, Eat Together (Eat3)

Healthy Start Partnership Coordinating Committee (HSP), a group of health and nutrition professionals from 6 rural counties in New York State, in collaboration with Cornell University faculty began “The Eat Well, Eat Local, Eat Together Campaign (Eat3).” They wanted to teach families how to choose, prepare, and eat healthy meals together using produce grown locally. Each county had an individual to serve as the liaison in contact with Cornell University. This program also required face-to-face meetings and conference calls funded by a US Department of Agriculture grant.
There were two different campaigns with varying components that were launched for Eat3. The first campaign was in 2008 and it lasted for four weeks. The components of the campaign included: a meal of the week highlighted in local grocery stores; recipe cards; an Eat3 sign; the meal of the week was featured in the local newspaper; a project website (www.eat3.org); marketing materials with a postcard with a magnet; a “Why Eat” brochure and other nutrition education materials (31, p. 1-3). Workers distributed 4000 postcards with Eat3 magnets. Other Eat3 materials were given to 15 community events and 17 grocery stores participated by having displays of Eat3 material and recipe ingredients. The website had 20,000 hits, averaging 35 sessions per day. The following year, in 2009, they modified the campaign; It lasted longer than 4 weeks and had less of a grocery store emphasis. Additional recipes were added to the press releases, changes were made to the website and postcards, and information to assess the campaign was collected. The goal was to reach 10,000 New York families and local farmers by means of social marketing to advocate for nutrition and health. They also wanted to encourage families to eat more meals together and to incorporate more fruits and vegetables grown from local sources. From July to November, 20 counties were reached with a new meal of the month that incorporated kid-friendly foods that were in-season and locally grown. Each meal of the month presented 2 new recipes (31 p. 3-4). The average number of daily sessions was 191.44, each website session being viewed an average of 27 minutes and associated with 9.56 page views. The website included a registration page, meal of the month recipes, information on nutrition, online discussion forums, and even bingo-like games for children (31 p. 5-6). $20,000 was given by the Cornell Cooperative Extension’s Director’s Innovation Fund to cover the various cost of incentive for registration, the project website, printed materials, and a salary for the project manager and author of the press releases. Data were collected from an online survey.
that entered participants into a monthly drawing for 2 $50 gift cards. 236 individuals completed the survey. They were asked various questions before and after learning about nutrition through the “Eat Well, Eat Local, Eat Together” program. The questions asked: how many servings of fruits and vegetables they consumed, how many times per week evening meals were eaten at home with the family, and how often local produce was bought. Additional questions included what barriers were present that prevented the family from eating healthy and eating together and a few demographic questions (31, p. 4-5). Young families were the target population and 33% of those who registered had children between the ages of 2 and 12 years living in their homes. 45% of registrants were 44 years of age or younger, 45% were 45-64 years of age, 6% were 65 years or older, and 4% did not give their age (31 p. 6-7). Frequencies of self-reported behaviors were shown to show the influence participation in the program on the 3 key targeted behaviors. The shift for all 3 outcomes was significantly higher. Prior to campaign, 13% of participants consumed 5 or more servings of fruits and vegetables each day. After the campaign, 37% consumed this amount (P < .001). The buying of local produce also increased from a mere 10% of people buying locally at least every other week before the campaign to 36% afterwards (P< .0001). Family meals eaten 4 or 5 times per week also increased, from 25% to 32%. Families eating meals 6 or 7 times a week increased from 43% before to 51% after the campaign (P < .001) (31, p. 7). The program did seem to shift eating behaviors in a favorable direction.

Results

<table>
<thead>
<tr>
<th>Nutrition and Physical Activity Program</th>
<th>Reference</th>
<th>Target Population, Participants (n)</th>
<th>Nutrition Measurement</th>
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<tbody>
<tr>
<td>CSHP Kids Nutrition and Fitness Program</td>
<td>Wright, Kynna, Keith Norris, Joyce Giger, and Zulma Suro. &quot;Improving Healthy Dietary Behaviors, Nutrition Knowledge, and Self-Efficacy among Underserved School Children with Parent and Community Involvement.&quot; CHILDHOOD OBESITY 8.4 (2012): 347-56. Pubmed.gov. Pubmed. 08 Aug. 2012. Web. 06 Oct. 2013.</td>
<td>Low-income Mexican-American Children, n= 251</td>
<td>Dietary behaviors, food preferences, knowledge, self-efficacy measured by valid questionnaire</td>
<td>Body mass index (BMI) percentiles and z-scores</td>
<td>KNF group: BMI decreased on average by 2.80 kg/m² (p=0.04), BMI z-scores on average by 0.48 (p=0.03) between baseline and 12th month follow-up. KNF group daily intake of vegetables increased on average by 1.51 (p=0.03), fruits by 2.00 (P= 0.001), 100% fruit juice intake by 1.12 (p=0.03). At 12 mo., an average increase of 20.00 (P= 0.02) for “always drinks 100% fruit juice.” Knowledge increased of the “5-a-day of fruits and veggies intake” from the food pyramid by 28.02 (p=0.001). Differences in the increases for food intentions were an increase of 3.60 (p=0.05); food knowledge increase of 4.38 (p=0.04); and an increase was seen in self-efficacy of healthy food choices by 1.02 (p=0.03). Parent involvement= 100% by twelfth month.</td>
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<td>YMCA Healthy, Fit, and Strong Program</td>
<td>Schwartz, Robert P., M.D., Mara Z. Vitolins, DrPH, Douglas L. Case, Ph.D, Sara C. Armstrong, M.D., Eliana M. Perrin, M.D., M.P.H., Josephine Cialone, R.D., and Ronny A. Bell, Ph.D., M.S. &quot;The YMCA Healthy, Fit, and Strong Program: A Community-Based, Family-Centered, Low-Cost Obesity Prevention/Treatment Pilot Study.&quot; CHILDHOOD OBESITY 8 (2012): 577-82. Pubmed. Web. 11 Nov. 2013. <a href="http://www.ncbi.nlm.nih.gov/pubmed/23181924">http://www.ncbi.nlm.nih.gov/pubmed/23181924</a>.</td>
<td>Diverse population, 59 kids</td>
<td>Height, weight, diet, activity questionnaire at 3, 6, 12 months. Paired t-tests were used to assess changes in these measures over the time period. Child eating behavior assessed by questionnaire</td>
<td>Activity questionnaire and BMI scores and percentiles for age and sex determined using CDC website measured at baseline, 3, 6, 12 months</td>
<td>Average attendance among the four sites was 51% for nutrition sessions and 60% for physical activity sessions.</td>
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<td>The Effect of Including Parents in A School Base Exercise and Nutrition Program for Children</td>
<td>Hopper, Chris A., Mary B. Gruber, Kathy D. Munoz, and Robert A. Herb. &quot;Effect of including Parents in a School-based Exercise and Nutrition Program for Children.&quot; Physical Education, Recreation and Dance (1992): 315-21. PubMed. Web. 8 Oct. 2013. <a href="http://www.ncbi.nlm.nih.gov/pubmed/1513963">http://www.ncbi.nlm.nih.gov/pubmed/1513963</a>.</td>
<td>n=132 fifth and sixth graders</td>
<td>A 24-hour dietary recall by interview was used to estimate food intake given at pre and post test, it calculated grams of protein, cholesterol, percent calories from fat and carbohydrates, saturated fat. Also, a 20-item multiple choice test on knowledge of nutrition given to children and parents</td>
<td>Children tested at pre and post test on: height, weight, skin fold, sit and reach, number of sit-ups in one minute, mile run, and exercise knowledge. Parents measured at pre and post-test on the same above except a step test instead of a mile run test. 20-item multiple-choice test on knowledge of physical fitness and exercise concepts given to kids and parents</td>
<td>The school-and-home group showed a higher mean improvement than the school-only group. The school-and-home group scored significantly higher compared to the control group on posttest nutritional knowledge, whereas the school-only group did not. Maybe more of health knowledge change rather than behavioral change.</td>
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<td>Thrifty Food Plan</td>
<td>Flynn, Mary M., Steven Reinert, and Andrew R. Schiff. &quot;A Six-Week Cooking Program of Plant-Based Recipes Improves Food Security, Body Weight, and Food Purchases for Food Pantry Clients.&quot; Journal of Hunger and Environmental Nutrition 1st ser. 8 (2013): 73-84. Journal of Hunger and Environmental Nutrition. Web. 23 Sept. 2013. [<a href="http://www.tandfonline.com/loi/whe">http://www.tandfonline.com/loi/whe</a> n20].</td>
<td>85 families from emergency food pantries and low-income housing sites</td>
<td>Height, weight, questionnaire assessing current Supplemental Assistance program (SNAP) benefits, current food habits, size of household, and ages of each member, race, and any changes from last appt.</td>
<td>78% claimed eating more vegetables; 44% reported consuming more fruit. 95% kept their grocery receipts. 76% claimed that recipes were easier to cook compared to their own and 94% responded they would be using recipes in the future</td>
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<td>Eat Well, Eat Local, Eat Together</td>
<td>Olson, Christine M., and Meredith L. Graham. &quot;The Eat Well, Eat Local, Eat Together (Eat) Nutrition Education Campaign.&quot; Journal of Hunger &amp; Environmental Nutrition 8.1 (2013): 1-10. Taylor and Francis Online. 14 Mar. 2013. Web. 11 Nov. 2013. [<a href="http://www.tandfonline.com/doi/abs">http://www.tandfonline.com/doi/abs</a> 10.1080/19320248. 2012.761573#preview].</td>
<td>6 rural counties in New York State, targeted young families, reached over 10,000 people from 20 counties</td>
<td>Face-to-face meetings, conference calls, self-reported behaviors of eating more fruits and vegetables, buying local produce</td>
<td>Self-reported: Before campaign: 13% of respondents consumed 5 or more servings of fruits and vegetables each day. After: 37%. Buying of local produce increased from 10% before to 36% after. Family meals eaten 4 or 5 times per week increased from 25% to 32%. Family meals eaten 6 or 7 times went from 43% to 51%.</td>
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Discussion

There are strengths, weaknesses, and points to be highlighted for each of the examined programs. The Kids Nutrition and Fitness Program contained a few weaknesses in their program. For example, consistent attendance and retention was difficult near the 12-month follow-up period for various reasons including lack of transportation and unsteady work schedules (39 p. 355). It also failed to examine the university member’s participation, university partner’s outlook, and challenges and benefits of involvement (39 p. 354). Also, since this study only measured up to 1 year, it is not certain if these habits will persist long-term. This study should be conducted on other minority groups as well as on a grander, more diverse population (39 p. 354). However, overall, this study was successful. Since more than 50% of the children participated in the intervention, this indicates that there are many students interested in learning about health and nutrition. There was great support from the schools showing that this program should be easily implemented in schools with similar backgrounds. This study also showed the importance of parental involvement in encouraging and practicing healthy lifestyles with their children.

For the YMCA Healthy, Fit, and Strong Program, there were several limitations to be discussed. Recruitment was difficult because the eligibility criteria were limited to children who were at or above the 85th BMI percentile. There was a small number of participants and the drop-out rate was 29% over the 12-month follow-up. There was also no control group in the study, which does not allow for a baseline or comparison group. The nutrition lesson did not include the children, so if the parents did not relay the nutrition information, children were not educated on nutrition or taught how to eat healthier. The physical activity program ended after
three short months; it should have continued throughout the program. Nutritional changes were reported by subjects, which allows for bias. Important obstacles to consider are: transportation, parent work schedules, and school sports. The lack of participation during certain weeks related mostly to the families not having transportation (35 p. 581). Over 20 million people, including 9 million youth under age 18 use one of the 2600 YMCAs located across the United States. Being the nation’s largest provider of child care, after school programs, and youth sports, the YMCAs can revise and reform community programs to cease and prevent further obesity in children and adults. This low cost, easy accessibility of the curriculum on a CD, and simple study could be implemented in schools, churches, or community centers (35 p. 581).

The Students and Parents Being Actively Involved in Being Fit After-School Program had a unique feature because they only allowed children and parents into the program if they agreed to directly participate in the program. Interestingly, only female guardians participated, many of them being overweight or obese. Overall, the adults tended to gain more health-related fitness benefits while the children showed more diet-related improvements. Work conflicts prevented some of the parents/guardians to attend some of the activities. An early-morning program was suggested as an alternative for those parents who work late in the afternoon. Also, there is question about the adequacy as a dietary assessment tool of the brief food frequency questionnaire used when pertaining to certain populations. The findings of this program are limited due to the fact that the sample size was small, there was an absence of control groups, and the program was arguably too short, consisting only of a 12-week intervention (10, p. 458).

The overall findings of the Effects of Including Parents in School-Based Exercise and Nutrition Program did not show tons of evidence that a school-and-home program is more effective than a school-only program. However, in other studies done previously, there had been
a greater weight reduction seen in obese children when targeting both children and parents in the
program. There could have been possible confounding between parental participation and
rewards. Child and parent participation could have increased because of the positive influence of
various rewards (14, p. 319). Also, there seemed to be an increase in health knowledge rather
than a behavioral change in regards to improving nutrition or physical activity. Lastly, instead of
incorporating a mile run, perhaps more enjoyable activities should be implemented such as
biking, dancing, or power walking. This program could also be extended for a longer period of
time to see more changes (14, p. 319).

Regarding the Thrifty Food Plan, the strengths of this study are that it contained a variety
of races and ages in the population and there were households with and without children. Having
the preparation and cooking methods shown to the participants probably raised attendance
because many said initially that they did not know how to cook. There were also limitations to
the study, for instance: complete diet intake data was not collected and thus, the experimenters
are not certain whether the improved choices of food correlated to improvements in intake. Also,
physical activity data was not collected from the participants and so there was no record if
change in physical activity could have been contributed to improved body weight (12, p. 79-81).

Some of the issues with the Eat Well, Eat Local, Eat Together campaign was that the
time it took to buy and prepare healthy meals for their families every day and the cost of fruits
and vegetables. To make it easier for families to have healthy meals together, the three most
common ideas were: a mini-farmers market, a local fruit and vegetables buying club, and a
community kitchen for food preparation. Nevertheless, people are interested in nutrition
education and healthy lifestyles. If there were more face-to-face contact linked with this project
website, it would have reached a larger number of individuals and would have had more of an
impact (31, p. 4). To examine the impact of the campaign, the post-then-pre evaluation was used. The problem of accuracy or bias arises with self-reporting because it is more subjective than objective. Also, with the pre and post evaluation method is that participants do not have sufficient information while taking the pretest to accurately respond to the evaluation; the pretest answers are often overestimated and then the posttest answers are usually more accurate. Thus, the comparison shows no change in behavior. Lastly, there is limited contact between the educators and the participants from community-based and online nutrition campaigns (31, p. 4).

Conclusion

13 critical years of adolescent life is spent for almost 6 hours a day in a school setting. In fact, 95% of our nation’s young people aged 5-17 years attend school. Evidence from the CDC shows that the school environment plays a major role in shaping physical, psychological, social, and intellectual development. Along with teaching academic success, schools influence health and social outcomes as well. School health is important because young healthy students perform better academically than non-healthy students. If students are not healthy, the education presented is not as well absorbed because children’s performance is poor if they suffer from hunger or chronic illness. Thus, an important goal for schools is to teach students is how to live healthy lifestyles. Coordinated school health programs (CSH) can enable schools to build partnerships and relationships among school health professionals, encourage communication amongst school health and public health, reduce redundancies in cross-curriculums, and direct efforts towards promoting healthy behaviors in students. According to the CDC, coordinated school health programs should aim for these four goals, “(1) Increase health knowledge, attitudes, and skills (2) Increased positive health behaviors and health outcomes (3) Improve
education outcomes (4) Improve social outcomes” (8). Also, the CDC advises that there are eight strategies to follow in order to create a coordinated approach to enhance school health policies and programs, these include, “1. Secure and maintain administrative support and commitment 2. Establish a school health council or team 3. Identify a school health coordinator 4. Develop a plan 5. Implement multiple strategies through multiple components 6. Focus on students 7. Address priority health-enhancing and health-risk behaviors 8. Provide professional development for staff (8).” From CDC reports of 2006, 67.8% of districts had someone to coordinate school health, however, only 20.7% of districts had received any training in their role as a school health coordinator. If school health coordinators are not educated on the importance of implementing nutrition education and physical activity programs into the schools, it will not be a main priority for the coordinators and/or the programs will not be contracted as effectively as it could be. A mere 27.4% of state schools have district food service directors and only 21.6% offered school food service managers state certification, licensure, or endorsement. Sadly, only 3.8% of elementary schools, 7.9% of middle schools, and 2.1% of high schools provided daily physical education for the duration of the school year. Concerning family involvement, only 41.4% of required health education classes encouraged family involvement and 33.1% of required physical education classes emphasized getting the whole family involved in physical activity. Clearly, there is a need for implementing much more nutrition education physical activity classes and also family involvement must be emphasized (8).

It is evident that parents and schools are the most important aspects of instilling lasting healthy eating and physical activity behaviors in children. Children need to be introduced early in their life to these intervention programs. From a public health perspective, “individual behaviors, such as diet and exercise must be addressed in the context of family, societal, and
environmental influences at the community level where children live” (2, p. 25). Thus, emphasizing the importance of healthy eating and physical activity behavior in the home and also having a coordinated school health program will transform individual behaviors into healthy lifestyle routines. Also, since the number of families in which both parents work continues to rise and there is not much curriculum pertaining to health education during the school day, school health intervention programs will be a necessary component for children and parents (23). As shown by the various programs, the incorporation of cooking as a family improved nutrition education and reinforced healthy eating. However, there are many other challenges to face when treating obesity including lack of time and community resources and lack of nutrition services. When addressing the obesity epidemic, barriers like these put a strain on the role of primary care providers. An avenue for physicians to refer people to can be community-based obesity prevention/treatment programs, such as school coordinated health programs for children and parents. However, one must keep in mind that each geographic location has varying availability and quality of resources (35 p. 577). According to the social-ecological model by McLeroy et al, society consists of the individual, interpersonal, organizational, community, and social elements that are all interconnected which habitually influence one another. To successfully instill lasting and healthier lifestyle choices, researchers must learn how all of these influential components can be addressed (7 p. 87).

These programs are examples of taking services directly to the people, which is an increasing trend in Public Health and health related programs. This method seems to be more effective in increasing participation as opposed to if the people had to travel to the services. For instance, instead of people coming to the Food Bank for cooking classes, the Food Bank provides its’ cooking classes at more convenient locations for the parents and children, i.e. at the
students’ schools. These programs should continue to be implemented into the in-school and after-school setting. In terms of policy ideas, each state could consider having a wellness coordinator to implement and integrate these health education programs in all schools. Currently, it is difficult to compare the programs because there is no standardized way to measure them. Discussion and collaboration needs to take place in order to decide on uniform measurement and evaluation of these programs.
LITERATURE CITED


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