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An Intervention for Multiethnic Obese Parents and Overweight Children

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Abstract

The purpose of this pilot study was to determine the effects of the addition of coping skills training for obese multiethnic parents whose overweight children were attending a weight management program. At 6 months, parents in the experimental group had significantly lower body mass index (BMI) and body fat percentage (BFP), and higher numbers of pedometer steps compared to the control group. Parents also demonstrated significant improvement in interpersonal relationships, behavior control, and stress management compared to the control group. Children in the experimental group demonstrated trends toward decreased BMI and BFP and increased pedometer steps.

1. Introduction

Obesity is increasing at an alarming rate in the United States. The percentage of at risk for overweight or overweight children and overweight and obese adults has increased dramatically over the past forty years with Black, Hispanic, and Native American families disproportionately affected (Jolliffe, 2004;United States Department of Health and Human Services [USDHHS], 2001). Currently, 64% of adults (Mokdad et al., 1999) are either overweight or obese and 30% of children (Centers for Disease Control and Prevention [CDC], 1999) are either at risk for overweight or overweight. Obesity is associated with an increased risk for pre-diabetes (impaired glucose tolerance (IGT) and impaired fasting glucose (IFG), type 2 diabetes, hypertension, dyslipidemia, cardiovascular disease, sleep apnea, and

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depression in children and adults leading to long-term morbidity and early mortality (Ruser, Federman, & Kashaf, 2005;Sturm, 2002). For the first time in two centuries there is a potential decline in life expectancy in the United States secondary to the effect of obesity on longevity (Olshansky et al., 2005). Obese adults spend approximately 36% more on health services and 77% more on medications than normal weight individuals (Sturm, 2002). Children account for approximately $127 million in overweight associated hospital costs secondary to type 2 diabetes, cardiovascular disease, sleep apnea, and orthopedic problems (Wang & Dietz, 2002).

In adults, overweight is defined as a BMI ≥ 25 – 29.9 kg/m^2 and obesity is defined as a BMI ≥ 30.0 kg/m^2 (National Heart, Lung, and Blood Institute [NHLBI], 2000). In children, at risk for overweight is defined as a BMI ≥ 85th percentile and overweight ≥ 95th percentile for gender and age (CDC, 1999;Kuczmarski et al., 2000). Black and Hispanic children are at a higher risk for developing overweight when their parents are overweight or obese, eat a diet high in fat, and do not follow a regular exercise program (Ogden, Flegal, Carroll, & Johnson, 2002;Troiano & Flegal, 1998). Parents who eat a nutritionally balanced diet and exercise regularly are in a unique position to be positive role models for their children.

Nutrition education, exercise, and behavioral interventions are the mainstay of treatment for overweight and obese parents (adults) and at risk for overweight or overweight children (Wadden, & Stunkard, 2002) and are aimed at improving nutritional choices, increasing physical activity, and decreasing sedentary activity. Adults and children may be targeted separately or together (Berry et al., 2004). Nutrition education is based on decreasing portion sizes, lowering fat intake, decreasing sugared drinks, and increasing lean meats and fish, whole grains, fruits, and vegetables (Engels, Gretebeck, Gretebeck, & Jimenz, 2005). A balanced nutritional approach teaches parents and children to eat foods within their cultural preference by making small changes in portions, fat content of recipes, and substituting healthier ingredients without dramatically changing the basic foods that they have grown up with and that are important for them to include in their daily meals. When caloric intake is decreased and exercise increased weight loss outcomes improve (Cole & Rolland-Cachera, 2002;Goldfield, Raynor, & Epstein, 2002). Parents who display high levels of unhealthy eating habits may foster the development of excess body fat in their children (Hood et al., 2000).

Exercise is important for parents and children to incorporate into their life on a daily basis. Currently, 39% of boys and 58% of girls aged 7–18 years old do not achieve recommended levels of exercise, which includes at least one hour a day at moderate intensity (Horgan, 2005). The goals for overweight and obese parents and children include increasing physical activity and decreasing sedentary behaviors such as television watching and playing video games. Parental exercise has been found to be associated with children's increased extracurricular sports participation and cardiorespiratory fitness (Cleland, Venn, Fryer, Dwyer, & Blizzard, 2005). The level of adult encouragement and intention have been found to predict vigorous activity and perceived level of competence in their children (Biddle & Goudas, 1996). Increasing lifestyle activity is designed to increase physical activity and decrease sedentary behaviors in day-to-day activities (Parizkova, Maffeis, & Poskitt, 2002).

Behavioral interventions with parents and children use varying levels of parental involvement (Cooper & Fairburn, 2002). When both parents and children are targeted for behavior change, weight loss outcomes usually improve (Epstein, 1996). Direct involvement in the weight loss process of at least one parent as an active partner with their child has been found to improve the child's short and long-term (1-yr) weight loss (Epstein, 1996;Wadden & Stunkard, 2002). In children 6 to 11 years old, where parents are frequently the mediators of change (Epstein, 1996), their children have demonstrated increased weight loss and positive behavior change (Golan, Fainaru, & Weizman, 1998;Golan, Weizman, Apter, & Fainaru, 1998). When parents

are taught new parenting skills such as problem solving, role modeling, self-monitoring, and praise, their children's weight loss outcomes have improved (Epstein, McKenzie, Valoski, Klein, & Wing, 1994). To date, a majority of family based interventions for children have been conducted on middle class White children and adults, whereas the prevalence of obesity is higher in Hispanic, Black, and Native American adults and children (Berry et al., 2004;Heisler, Rust, Pattillo, & Dubois, 2005)

Coping skills training (CST) is a form of a cognitive behavioral intervention and is based on social learning theory (Bandura, 1977), which is designed to improve self-efficacy outcomes. CST includes communications skills training, which includes social skills training and assertiveness training, social problem solving, conflict resolution, and cognitive behavior modification. (Forman, 1993). Grey and colleagues (2000) found that in female patients with type 1 diabetes, CST prevented weight gain, and improved long-term metabolic and psychosocial outcomes. In a pilot study of a school-based intervention program to prevent type 2 diabetes among high-risk youth, CST was successful in improving nutrition and exercise for both Black and Hispanic children and parents, and improving metabolic outcomes in the children (Grey et al., 2004). However, these studies did not specifically target obese parents of overweight children.

The majority of studies using nutrition education, exercise, and behavioral interventions for obesity target White middle class adults and children separately or together and have had mixed results (Berry et al., 2004). There are no data about interventions using CST to target multiethnic obese parents and their overweight children attending a weight management program.

This paper presents results from a pilot study conducted to determine the effects of the addition of CST for obese multiethnic parents whose overweight children were attending the Bright Bodies weight management program. The primary research question was, "What are the effects of the addition of CST for obese multiethnic parents whose overweight children were attending a weight management program on clinical outcomes of parents and their children and health behavior outcomes of parents?"

2. Methods

Following approval for protection of human subjects from the Yale School of Nursing and Yale New Haven Hospital Institutional Review Boards, parents whose children were enrolling in the Bright Bodies weight management program were given a brochure describing the study. If they were interested in joining the study, they were invited to call the research office and leave a message. The principal investigator (PI) called them back to answer any questions, and they were screened for eligibility by asking their height and weight and calculating their BMI (kg/m^2). If they were interested, the PI scheduled an appointment to meet with the parent and child to discuss the study and review the consent and child assent forms. Inclusion criteria included any ethnic group (Black, Hispanic, White), either gender, English or Spanish speaking parents and their children between the ages of 7 to 17 years who assented, and whose parent or guardian consented to their participation, BMI ≥ 25 for parents and $\geq 85^{th}$ percentile for children, and no major diagnosis that would affect their participation in the study.

After the participants consented and children assented to join the study, they were randomized by class, using the "sealed envelope technique" in blocks of 8–10 parent-child dyads to either the experimental group or the control group. Between November 1, 2003 and September 30, 2004, 80 parent-child dyads, met the inclusion criteria, and agreed to participate. All parents and children who consented to be a part of the study received an Accusplit Eagle 170 Deluxe

Activity Pedometer and a Pedometer Walking Book (Sweetgall, 2001) with a one-year pedometer log book.

2.1 Setting and Sample

The study was conducted at a middle school in an early evening program. A total of 88 parents contacted the PI to participate in the study. However, 8 parents did not meet the inclusion criteria of having a BMI ≥ 25 so were not included in the study. A total sample of 80 parent-child dyads were inducted into the study. The baseline demographic characteristics of the parents and children can be seen in Tables 1 and 2. There were no significant ($p < .05$) baseline differences between the parents or children. All of the parents and children were able to read, write, and speak English. Therefore, the intervention was delivered in English.

2.2 Intervention

The intervention protocol is shown in Table 3. All children and parents received the nutrition and exercise education program (NEEP). All children received formal exercise and behavior modification and all parents were encouraged to exercise as detailed below. Only the experimental parents received CST.

The Bright Bodies registered dietitians taught the NEEP classes once a week. Nutrition education focused on making better food choices, ethnic menu plans, lowering fat and calories, and portion control. Exercise education focused on increasing physical activity and decreasing sedentary behaviors. The experimental and control group parents and children attended 6 weekly 45-minute classes together and then the experimental and control children attended an additional 6 weekly 45-minute NEEP classes with behavior modification without their parents.

The Bright Bodies exercise physiologists taught the exercise classes twice a week. The exercise classes for the children were held in an exercise room at the hospital or at a local middle school gymnasium. Activities included basketball, dancing, tag, exercise bicycles, rowing machines, and stair climbing. The experimental and control children attended 12 twice a week 45-minute classes. The experimental and control parents were encouraged by the research assistants to walk between 30 to 60 minutes a day and keep track of their progress in their pedometer log books. If they felt they could not do 30 minutes at one time, they were encouraged to take at least 3 walks lasting for 10 minutes each day. Parents were asked to get medical clearance from their health care provider before self-starting an exercise program.

The Bright Bodies registered dietitians taught the behavior modification classes with NEEP once a week during the last 6 weeks of classes to both the experimental and control children without their parents once a week for 45-minutes. Behavior modification focused on improving self-image and learning new skills such as self-awareness, stress control and stress management.

The CST classes were taught to the experimental parents in six weekly 60-minute classes. The CST classes included an introduction, cognitive behavior modification and exercise, social problem solving and barriers to weight loss, assertiveness training and how to motivate yourself, conflict resolution and rebounding from relapse, and social problem solving and weight maintenance.

Communications skills training included social skills training and assertiveness training, which assisted individuals to express themselves in a clear and constructive manner. Social skills training taught parents ways to communicate that resulted in positive outcomes and included instructions on how to handle social situations by witnessing role modeling, practicing role-play, and receiving feedback on role-play. Assertiveness training encouraged communication

that was direct and honest between parents and their family members in regards to motivating themselves to eat healthier foods and to exercise daily.

Social problem solving provided skills necessary to deal with societal pressures by thinking through a problem and the process that was required to solve it, which allowed insight into possible outcomes and consequences of decisions made. Forman (1993) identified six problem-solving steps, which included identifying the problem, determining goals, generating alternative solutions, examining consequences, choosing a solution, and evaluating the outcome. Social problem solving was used to address barriers to weight loss and weight loss maintenance.

Conflict resolution provided skills necessary to resolve conflict in a positive manner and resulted in positive outcomes (Deutsch & Brickman, 1994). The conflicts in relation to rebounding from relapse were identified and all possible outcomes were explored. Role-playing allowed new skills to be practiced and feedback was obtained in relation to communication skills and conflict resolution.

Cognitive behavioral modification (Cooper & Fairburn, 2002) included recognition of thoughts, and feelings, problem solving, and guided self dialogue in relation to exercise. First, group members were given time to reflect on how they thought and responded in certain situations. Second, thoughts were examined to see if they were based on assumption or fact. Third, they were taught to use their thoughts to help them follow through on a decision made in the previous step. Group members were encouraged to list their negative thoughts and then they formulated alternative positive thoughts to counter the negative thoughts in relation to exercise.

2.3 Outcome Measures

Date were collected at baseline, 3 months (completion of the 12-week intervention), and 6 months on all clinical and health behavior outcomes. Trained research assistants blinded to the study group collected clinical and psychosocial data.

Two research assistants collected parent and child clinical outcomes and included height, weight, calculated BMI, body fat percentage (BFP), and downloaded pedometer steps at baseline, 3 months, and 6 months on both the parents and their children. Height was measured using a wall-mounted stadiometer, which was calibrated in 1/8 cm intervals. Weight was measured using a Tanita Body Fat Monitor and Scale and measured in kilograms (kg). The Tanita Body Fat Analyzer Scale (TBF300) was zeroed and calibrated before each measurement. BMI was calculated using the formula BMI = kg/m^2 for the parents and the BMI gender and age specific growth charts for the children (Kuczmarski et al., 2000).

BFP was obtained using the TBF300, which was programmed for each participant entering age, gender, height, and activity level. The TBF300 uses leg-to-leg bioimpedance analysis (BIA), which is a low-level electrical signal that is passed through the body using foot electrodes. BFP is calculated based on the amount of impedance as the current flows from one point to another (Davies & Cole, 1995). The signal passes faster through lean muscle than fat, because muscle contains approximately 70–75% of the body's water, and fat contains almost no water (Davies & Cole, 1995). BIA is most consistent and reliable if the participant is properly hydrated and they wait three hours after eating or exercising before measuring BFP. All adult participants were asked if they had pacemakers or internal cardiac defibrillators before BFP measurement since BIA is contraindicated in those participants. BIA has been found to correlate well with Hydrodensitometry and DEXA (Nunez, Rubiano, Horlick, Thornton, & Heymsfield, 1999). BFP was calculated on all participants consistently between the hours of 5:00 pm – 7:00 pm at baseline, 3 months, and 6 months.

As a part of the study each parent and child participant were given an Accusplit Eagle 170 Deluxe Activity Pedometer and a Pedometer Walking Book (Sweetgall, 2001) with a one-year pedometer log book. The pedometers counted steps, computed walking distance in miles, and computed calories burned. The research assistants taught both the parents and children how to program their pedometers and use their pedometers and both the parents and children gave the research assistants a return demonstration. They were also given written instructions on how to program their pedometers to take home with them. The parents and children were asked to return to the research assistant and have their pedometer reprogrammed if they lost 5 pounds or if they were unsure how to reprogram it themselves. The pedometers were programmed by measuring stride length using a standard measuring tape and measuring the participant's stride three times (heel of one foot to heel of the next foot) after walking down a 30-foot hallway. The mean of the three measurements was then programmed into the pedometer with the participant's weight. Pedometer readings were collected by the research assistants by looking at the pedometer log book of both the parents and children at baseline, 3 months, and 6 months.

Parent health behavior outcomes were assessed using the Family Assessment Device (FAD), the Eating Self-Efficacy Scale (ESES), and the Health Promoting Lifestyle Profile II (HPLPII). The subscales of the FAD were used to measure general family functioning, problem solving, communication, roles, affective involvement, affective responsiveness, and behavior control. The self-report questionnaire consisted of 60-items and measures six family functioning dimensions (Epstein, Levin, & Bishop, 1976). A 4-point Likert-scale was used to determine a member's perception of the family. The test included both positive and negative statements that require reverse scoring. Item responses were totaled to obtain a total subscale score. A higher score indicated unhealthy family functioning. Reliability and internal consistency with coefficicient alphas were as follows: The General Functioning Scale (.83–.86), Roles Scale (.57–.69), Problem Solving (.74–.80), Communication (.70–.76), Affective Responsiveness (.70–.78), Affective Involvement (.70–.78), and Behavior Control (.71–.73) (Arslanian, 2002). The test-retest reliability was based on data from a non-clinical sample tested at a 1-week interval and included the following: Problem Solving (.66), Communication (.72), Roles (.75), Affective Responsiveness (.76), Affective Involvement (.67), Behavior Control (.73), and General Functioning (.71) (Miller, Epstein, Bishop, & Keitner, 1985). Construct validity for each scale ranged from .83 to .90 (Miller et al., 1985). The FAD has been widely used with diverse populations and has been translated into seven languages (Kabacoff, Miller, Bishop, Epstein, & Keitner, 1991).

Both scales of the ESES (Glynn & Ruderman, 1986) were used to measure self-efficacy related to dietary changes. The instrument is a 25-item scale asking participants to rate their difficulty controlling eating from 1 (no difficulty controlling eating) to 7 (difficulty controlling eating) on two subscales, which include negative effect (NA) and socially acceptable circumstances (SAC). Total scores range from 25 to 175 with a higher score indicating more difficulty controlling eating. Internal consistency reliability alpha co-efficients for the entire scale was .92 and .94 for the NA subscale and .85 for the SAC subscale (Glynn & Ruderman, 1986). The test-retest reliability was .70 in a sample (n = 600) women and men.

The HPLP II was used to measure health promoting lifestyle behaviors (Walker, Sechrist, & Pender, 1987). The instrument is a 48-item 4-point Likert scale that measures the frequency of health promoting behaviors in six subscales, which include health responsibility, exercise, nutrition, interpersonal relationships, stress management, and spiritual growth. The instrument has been used in minority and Caucasian populations (Jefferson, Melkus, & Spollett, 2000) and is available in English and Spanish. Alpha co-efficients range from 0.92 for the entire scale and from 0.70 to 0.90 for the subscales. Test-retest reliability in Black women has ranged from 0.70 to 0.74.

A demographic data sheet was used at baseline for parents to provide data on sociodemographic status such as ethnicity, race, socioeconomic status, and religion. In addition, age, birth order, gender of their children, and any health problems that their children had was obtained.

2.3.1 Participation in the Intervention

Attendance sheets were documented weekly for both the children and their parents. Seven (8%) of the parent-child dyads dropped out after baseline data. The majority of the parents and children, when asked why they decided to not continue, responded that they were not "overweight enough" or that they had "moved and it was too far to travel" to attend the program. At 3 months, 13 more parent-child dyads (total = 20 dyads) or 25% dropped out of the study and they gave the same answers when asked why they decided not to continue. However, of the twenty, seven had moved and left no forwarding address or telephone number at which to contact them. According to several parents, it was common to move "two to three times a year to a new apartment." Not all participants attended all of the classes offered. Seventy-five percent of the participants took advantage of the make-up classes offered.

2.4 Analyses

Data were entered into an SPSS database and checked for accuracy. Analyses were performed using version 13.0 of the Statistical Package for the Social Sciences (SPSS, 2005). Chi-square and t-tests were used to compare baseline group differences. Repeated measures analysis of variance (ANOVA) was used to test the hypotheses that the participants in the experimental group would have improved parent and children clinical outcomes and improved parent health behavior outcomes at 3 months and 6 months when compared to the control group. For this pilot study, trends are reported at or below $p = 0.3$.

3. Results

Parents ranged from 27–77 years (M = 42.3, SD + 8.2), were 87.5% female, 35.0% Black, 36.2% Non-Hispanic-White, and 28.8% Hispanic. Children ranged from 7 – 17 years (M = 11.9, SD + 2.4), were 58.8% male, 33.8% Black, 36.2% White, and 30.0% Hispanic. The randomization procedure produced two parent and children groups comparable on demographic and clinical variables at baseline (Tables 1 and 2). Both the experimental and control groups received equal NEEP classes, so differences between the randomized groups at 3 and 6 months may be due to the CST intervention.

Tables 4 and 5 contain the results of the repeated measures ANOVA. By 6 months, the experimental group parents had significantly lower BMI ($p = .003$) and BFP ($p = .02$), and increased their pedometer steps ($p = .03$) compared to the control group. Parents demonstrated significant improvement in interpersonal relationships ($p = .04$), behavior control ($p = .04$), and stress management ($p = .05$), and showed trends toward improved nutrition ($p = .06$), physical activity ($p = .1$), health responsibility ($p = .3$), negative affect eating ($p = .06$), socially acceptable eating ($p = .08$), problem solving ($p = .06$), general family functioning ($p = .2$), and family roles ($p = .3$) compared to the control group. At 6 months, the experimental children demonstrated trends toward decreased BMI ($p = .08$) and BFP ($p = .1$) and increased pedometer steps ($p = .2$). No significant differences or trends were noted in spirituality, communication, affective responsiveness, or affective involvement.

4. Discussion

Results from this pilot study demonstrate that the addition of CST for parents enhanced outcomes in an established weight management program for overweight youth. Both experimental parents and children had better outcomes compared with the control group. Both

experimental and control group parents and children received NEEP and some form of exercise training and thus outcomes improved in both groups.

The National Weight Control Registry has followed over 4,500 individuals over the age of 18 years who have successfully maintained a 30-pound weight loss for a minimum of 1 year (Wing & Hill, 2001). Findings suggest that successful losers reported making substantial changes in their eating and exercise habits to lose weight and maintain their weight loss and that walking was the most frequent form of physical exercise. In addition, shared behavioral strategies among those who were successful at weight loss and maintenance included eating a diet low in fat, frequent self monitoring of weight and food intake, and high levels of physical activity (Wing & Hill, 2001).

To date, no studies have been reported using an experimental design to test the impact of the addition of CST delivered to obese multiethnic parents whose overweight children were attending an established weight management program on clinical outcomes of both parents and children and behavioral outcomes of the parents. These experimental parents and children's ability to decrease BMI, BFP, increase pedometer steps, and the parent's ability to improve behavioral outcomes after 6-months provides support for interventions that include both parents and children using NEEP, exercise, and CST over interventions that use nutrition education and exercise alone.

These data demonstrate that parent participants who received CST showed improvement in nutrition and physical activity knowledge, stress management, interpersonal relationships, negative affect eating, socially acceptable eating, problem solving, and behavior control compared to those parents who did not receive CST. BMI and BFP in parents in the experimental group's values steadily decreased over the 6-month period, whereas the control group's values increased slightly. Pedometer steps increased for both the experimental and control parent groups, but the experimental parents increased number of steps per day more than the control group.

Previous studies using nutrition education, exercise, and either behavior modification, behavioral therapy, or problem solving in family-based interventions with parents and children have demonstrated mixed results and predominately targeted White middle class families (Berry et al., 2004). Similar to this study, previous studies that used some form of behavior modification (Golan et al., 1998;Israel, Guile, Baker, & Silverman, 1994;Wadden et al., 1990) or behavioral therapy (Epstein et al., 1994;Flodmark, Ohlsson, Ryden, & Sveger, 1993) and targeted parents or children separately were found to improve weight loss outcomes. As in this study, other studies that used problem-solving (Epstein, Paluch, Gordy, Saelens, & Ernest, 2000;Graves, Meyers, & Clark, 1988) interventions and targeted parents of children showed improved weight loss outcomes for their children.

A difference in this pilot study compared with most behavioral intervention studies with parents and children, is that our data suggest that CST taught to multiethnic parents improves health promoting behaviors such as nutrition knowledge, exercise, stress management, and interpersonal relationships. Furthermore, socially acceptable eating and negative affect eating improved suggesting improved eating self-efficacy. Finally, family problem solving, family roles, general family functioning, and behavior control improved after receiving CST. The addition of a parental behavioral component appeared to enhance weight management behaviors in parents and showed similar beneficial trends in their children.

4.1 Limitations

As a pilot study, these data do not provide definitive evidence that a NEEP, exercise, and CST program targeting obese multiethnic parents of overweight children will have long-lasting

results. Drop out rates and loss to follow-up was moderate. When working with low-income multiethnic families who move from two to three times a year, we have learned that at induction it is important to record additional family members telephone numbers and permission to call them if the study staff has difficulty contacting them.

The data suggest CST delivered to parents adds an important component to a traditional weight management program for children. The partnership between parent and child with the parent role modeling healthy behavior change may be effective in changing family health behavior. Further testing of the CST intervention and extending it to children may provide increased knowledge of weight management in parents and children.

4.2 Implications for nursing practice and research

The study demonstrates positive effects of CST for multiethnic obese parents and their overweight children. Nurses can use CST in research and clinical practice to teach management and prevention of overweight and obesity in parents and children. Nurses teaching parents and children the importance of good nutrition and daily exercise can use cognitive behavioral modification, social problem solving, communications skills training, and conflict resolution.

Nurses can use cognitive behavioral modification (Cooper & Fairburn, 2002) to teach parents and children about the importance of daily exercise. Parents and children can better understand the barriers they may be having to losing weight when the nurse is able to help them identify the problem, determine goals, generate alternative solutions, examine the consequences, choose a solution, and evaluating the outcome using social problem solving (Forman, 1993). Nurses can teach parents and children the importance of direct and honest communication with each other that results in positive outcomes and conflict resolution (Deutsch & Brickman, 1994) that encourages parents and children to improve their health. In addition, nurses can be instrumental in helping parents and children understand that weight management is difficult work, and that relapse is not uncommon, and should not be viewed as a failure. Instead relapse should be viewed as an opportunity to get back on track as soon as possible.

Weight management programs including nutrition education, exercise, and some form of behavioral modification for parents and children are congruent with *Healthy People 2010's* goals for reduction of overweight and obesity to decrease morbidity and mortality. Parents and children need to be empowered to improve their health, manage their weight, and ultimately prevent the development of type 2 diabetes and cardiovascular disease later in life. CST may add another component that improves clinical and psychosocial outcomes. However, further research is needed.

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Table 1

Demographic Baseline Comparison of Experimental and Control Group Parents

	Experimental Group(n = 40)	**Control Group(n = 40)**			
Demographics	**M ± SD**	**M ± SD**	**t**	**df**	**p**
Age	41.1 ± 7.6	43.6 ± 8.6	−1.4	78	.2
Body Mass Index	37.7 ± 7.0	37.9 ± 10.8	−1.3	78	.2
Body Fat Percentage	43.3 ± 6.8	43.4 ± 8.4	−0.8	78	.4
Pedometer Steps	2356 ± 953	2334 ± 728	−0.5	75	.6
	n	n	x^2	df	p
Gender					
Female	34	36	.5	1	.5
Male	6	4			
Ethnicity					
Black	17	11	3.0	2	.2
Hispanic	12	11			
White	11	18			
Income*					
<$19,900	10	9	7.1	6	.3
$20,000 – $59,999	24	19			
$60,000 > $100,000	5	8			

*Five participants did not answer

Table 2

Demographic Baseline Comparison of Experimental and Control Group Children

	Experimental Group(n = 40)	**Control Group(n = 40)**			
Demographics	**M ± SD**	**M ± SD**	**t**	**df**	**p**
Age	11.9 ± 2.3	11.9 ± 2.5	−0.0	78	1.0
Body Mass Index	35.8 ± 5.1	36.7 ± 5.6	−0.7	78	.5
Body Fat Percentage	45.5 ± 7.1	44.9 ± 8.2	−0.4	78	.7
Pedometer Steps	1921 ± 876	1955 ± 721	−0.2	75	.9
	n	n	x^2	df	p
Gender					
Female	24	23	.05	1	.8
Male	16	17			
Ethnicity					
Black	16	11	2.8	2	.3
Hispanic	13	11			
White	11	18			
Birth Order					
First Born	25	22	1.9	4	.8
Second Born	10	12			
Third Born	3	5			
Fourth Born	2	1			

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Table 3

Intervention

Experimental Parents	Control Parents	Experimental and Control Children
6 weeks of NEEP	6 weeks of NEEP	6 weeks of NEEP
6 weeks of CST	12 weeks of Exercise	6 weeks of BM with NEEP
12 weeks of Exercise		12 weeks of Exercise

NEEP = Nutrition and Exercise Education Program

BM = Behavior Modification

CST = Coping Skills Training

Table 4

Clinical Outcomes for Parents and Children at Baseline, 3 Months, and 6 Months

	Experimental			Control			Group × Time	
Clinical Outcomes	**Baseline M(SD)**	**3 Month M(SD)**	**6 Month M(SD)**	**Baseline M(SD)**	**3 Month M(SD)**	**6 Month M(SD)**	**F**	**p**
Parents								
Body Mass Index	37.7(7.0)	37.1(6.8)	36.9(6.9)	37.9(10.8)	38.0(10.9)	38.2(11.2)	6.4	.003
Body Fat Percentage	43.3(6.8)	42.4(7.2)	42.0(7.6)	43.4(8.4)	43.7(8.1)	43.9(8.6)	4.1	.02
Pedometer Step s	2356(953)	4471(1215)	5843(1407)	2334(728)	3953(1747)	4803(1565)	3.9	.03
Children								
Body Mass Index	35.5(7.0)	35.0(5.4)	34.3(5.5)	35.9(5.6)	35.7(5.8)	35.6(6.1)	2.6	.08
Body Fat Percentage	45.2(7.9)	43.4(7.5)	42.8(7.6)	44.8(8.1)	43.4(7.0)	43.5(7.2)	2.1	.1
Pedometer Steps	1942(931)	37431015	5098(1377)	2019(743)	3754(1794)	4724(1734)	1.4	.3

Table 5

Behavioral Outcomes for Parents at Baseline, 3 Months, and 6 Months

	Experimental			Control			Group × Time	
Outcome	**Baseline M(SD)**	**3 Month M(SD)**	**6 Month M(SD)**	**Baseline M(SD)**	**3 Month M(SD)**	**6 Month M(SD)**	**F**	**p**
Health Promoting Lifestyle Profile II (HPLPII)								
Health Responsibility	2.26(.54)	2.58(.64)	2.64(.64)	2.42(.57)	2.65(.61)	2.64(.57)	1.2	.3
Nutrition	2.34(.64)	2.67(.67)	2.79(.59)	2.34(.46)	2.53(.48)	2.45(.47)	3.0	.06
Physical Activity	1.74(.63)	2.25(.70)	2.42(.59)	1.69(.49)	1.94(.62)	2.01(.63)	2.2	.1
Stress Management	2.12(.48)	2.45(.61)	2.68(.55)	1.97(.45)	2.18(.54)	2.24(.56)	3.2	.05
Interpersonal Relationships	2.74(.51)	2.91(.60)	2.95(.52)	2.84(.53)	2.94(.51)	2.81(.52)	3.4	.04
Spirituality	2.75(.45)	2.85(.54)	2.78(.56)	2.73(.58)	2.88(.54)	2.75(.49)	.3	.7
Family Assessment Device (FAD)								
Problem-Solving	2.02(.45)	1.96(.37)	1.84(.46)	2.03(.39)	2.14(.46)	2.06(.45)	3.0	.06
Behavior Control	1.68(.38)	1.68(.40)	1.66(.38)	1.64(.37)	1.65(.34)	1.82(.33)	3.3	.04
General Functioning	1.79(.47)	1.86(.37)	1.76(.41)	2.01(.48)	2.02(.35)	2.01(.37)	1.5	.2
Roles	2.31(.47)	2.26(.41)	2.24(.39)	2.56(.41)	2.42(.36)	2.40(.33)	1.1	.3
Communication	1.95(.50)	1.91(.44)	1.97(.41)	2.10(.43)	2.05(.42)	2.09(.37)	.3	.8
Affective Responsiveness	1.85(.53)	1.87(.47)	1.93(.47)	2.10(.49)	2.01(.41)	2.08(.38)	.6	.5
Affective Involvement	2.00(.48)	2.15(.31)	1.96(.41)	2.14(.50)	2.26(.35)	2.12(.41)	.2	.8
Easting Self Efficacy Scale (ESES)								
Socially Acceptable Eating	38.8(14.4)	35.9(12.9)	32.2(12.3)	36.5(15.8)	37.9(14.8)	37.3(15.2)	2.6	.08
Negative Affect Eating	48.4(26.1)	41.1(20.1)	40.5(18.6)	51.7(28.7)	54.2(28.7)	51.3(22.9)	2.9	.06