

# A Healthy Lifestyle Program for Latino Daughters and Mothers: The BOUNCE Overview and Process Evaluation

Norma N. Olvera, Brook Knox, Rhonda Scherer, Gabriela Maldonado, Shreela V. Sharma, Lisa Alastuey, and Jill A. Bush

## ABSTRACT

**Background:** Few family-based healthy lifestyle programs for Latinos have been conducted, especially family programs targeting mother-daughter dyads. **Purpose:** To assess the acceptability and feasibility of the Behavior Opportunities Uniting Nutrition Counseling and Exercise (BOUNCE) program designed for Latino mother-daughter pairs. **Methods:** 92 participants (46 mother-daughter pairs) were recruited from two elementary schools (3rd- 6th grades). Process evaluation measures included attendance rates, instructor and participant's evaluation of program. **Results:** Moderate levels of participation were maintained during the BOUNCE program. Of the 46 mother-daughter pairs who were enrolled, 35 pairs (76%) completed pre- and post- intervention measurements. Participants rated BOUNCE program activities, content, and instructors as highly satisfactory. Daughters reported cooking, food tasting, journaling, and dancing as the most enjoyable and helpful activities. Mothers' most reported enjoyable and helpful activities were grocery shopping tour, food tasting, samba, and salsa dancing. Child care needs, low literacy, parental working schedule, religious beliefs against dancing, and mandatory tutoring were identified as participation barriers. **Discussion:** Process evaluation demonstrates the feasibility and acceptability of the BOUNCE program. Identifying and addressing barriers to participation during the developmental stages of the intervention strengthened the design of this intervention. **Translation to Health Education Practice:** Results should be of value to health educators involved in the development, implementation, and evaluation of community- and family-based interventions designed for Latino families.

## BACKGROUND

Obesity is a leading public health problem in the United States<sup>1-2</sup> and is a rising problem among all groups regardless of age, gender, race, ethnicity, or socioeconomic status.<sup>3-4</sup> However, it is disproportionately affecting some ethnic groups at higher and faster rates than others, particularly Latino women.<sup>3-4</sup> The body mass index (BMI) difference between White and Latino women is already present at age two and dramatically widens with increasing age.<sup>3-4</sup> The rise in prevalence rates of obesity among Latino women highlights the significance of developing interventions to prevent obesity in young girls.

Given that research underscores the strong link between parent and child obesity,

Norma N. Olvera is an associate professor in the Department of Health and Human Performance, University of Houston, Garrison Room 104, Houston, TX 77204; E-mail: nolvera@uh.edu. Brook Knox, is a research assistant in the Department of Health and Human Performance, University of Houston, Garrison Room 104, Houston, TX 77204. Rhonda Scherer is a research assistant in the Department of Health and Human Performance, University of Houston, Garrison Room 104, Houston, TX 77204. Gabriela Maldonado is a research assistant in the Department of Health and Human Perfor-

family-based healthy lifestyle interventions may be key to combating overweight.<sup>5-10</sup> Yet,

mance, University of Houston, Garrison Room 104, Houston, TX 77204. Shreela V. Sharma is an assistant professor in the Health Sciences Center, University of Texas at Houston, School of Public Health, RAS E-603, 1200 Herman Pressler, Houston TX 77030. Lisa Alastuey is a visiting assistant professor at the Department of Health and Human Performance, University of Houston, Garrison Room 104, Houston, TX 77204. Jill A. Bush is an associate professor in the Department of Health and Human Performance, University of Houston, Garrison Room 104, Houston, TX 77204.



few interventions targeting the family by promoting proper dietary intake and physical activity have been conducted.<sup>11-17</sup> In most interventions parental involvement has been limited to providing health/wellness information and handouts to parents via family packs and newsletters,<sup>11-14</sup> post-cards,<sup>17</sup> bulletin boards, weekly progress reports, and informative health articles made available in English or Spanish.<sup>16</sup> Other interventions have involved parents through family homework projects and activities to assist learning about healthy lifestyle practices.<sup>12-15</sup> Family-based interventions have also offered interactive and enjoyable environments for parents, community members, school personnel, and children to congregate and commemorate healthy lifestyles.<sup>14,16</sup>

A suggested innovative approach to family-based intervention is to target specific intergenerational dyads which capitalize on natural interactions that occur across generations of women such as mother-daughter pairs.<sup>9</sup> It is well documented that mothers play a major role in their daughter's attitudes toward food<sup>18</sup> and body weight concern.<sup>19</sup> Yet, maternal involvement in obesity prevention and treatment programs designed for young girls has been limited.<sup>20</sup> To our knowledge, only three interventions have systematically included mother-daughter dyads.<sup>10,21,22</sup> One of these interventions was 12 weeks in duration and targeted middle-class white mother-daughter pairs who performed only exercise.<sup>10</sup> Two other 12-week interventions included African American mother-daughters pairs in which the intervention had exercise and diet components.<sup>21,22</sup> However, the feasibility of an intervention with mother-daughter pairs has not been evaluated in Latino families. Thus, the purpose of this research project was to assess the acceptability and feasibility of the BOUNCE program throughout process evaluation. This process evaluation, which included participant engagement (attendance rates), instructor's evaluation, and how the program was received by participants (subjective rating), is relevant to consider when assessing whether the program achieved its goal.

## METHODS

### *Schools and Research Design*

Forty-six mother-daughter pairs (N=92) from two elementary schools (grades 3-6<sup>th</sup>) located within the same school district were recruited to participate. To limit variability between schools, we matched schools in terms of the following characteristics: a) percentage enrollment of Latino students of the two schools (86% and 90%); b) percentage of students receiving governmentally supported free or reduced lunch plans in the two schools (99% and 94%); and c) school geographic location (urban setting). Within each school, mother-daughter pairs were eligible to participate if they meet the following criteria: (1) be of Latino origin with mothers and daughters residing in the same household; (2) daughters must be between the ages of 7-13 years old; and (3) mothers must be willing to participate. Exclusionary criteria involved mothers and daughters having a medical condition or dietary constraints that would limit their ability to participate in the program or measurement assessments. Participating families were recruited through flyers mailed to homes of Latino families and informative dance and oral orientation presentations held at each school. The desired sample for this study was 50 mother-daughter pairs. All girls provided assent and mothers provided informed consent at the time of the baseline assessment. This study was reviewed and approved by the committee for the protection of human subjects at the University of Houston.

To avoid treatment group contamination and for administrative convenience and ethical consideration, we used a cluster randomization design to assign a school to the experimental (EG) or control group (CG). The criterion for school assignment to the experimental group was based on which school name was alphabetically first. Structural design of the EG and CG is described in Table 1. Participants in the EG received two 45-minute sessions of nutrition education two times per week, one 45-minute counseling session per week, and three 45-minute exercise sessions per week. Participants in

the CG participated in one-and-a-half-hour weekly sessions. During the first 45 minutes of the session, CG participants received nutrition and counseling handouts and were encouraged to ask questions about the written materials. For the remaining 45 minutes, CG participants engaged in either intermittent aerobic-type dance (e.g., Salsa, Samba and Hip Hop dance), resistance training with resistive bands or team sports activities (e.g., basketball and free play recreational activities). A child psychologist and licensed counselor, registered dietitian/nutrition educators, and trained Cooper Institute Fitness Specialists led the respective class sessions for the EG and CG. Two additional instructors assisted the lead instructor in delivering the intervention and one of these two assistants served as an evaluator.

### *Formative Assessment*

Twelve months prior to the implementation of the BOUNCE program, a panel of experts that included a registered dietitian, a senior level nutrition student, a health educator, two exercise physiologists, a behavioral psychologist, and a physical education teacher met to review literature of lifestyle programs. After reviewing the literature, this panel was responsible for the development of the BOUNCE curriculum, BOUNCE logo and acronym, and lesson format. A second panel consisting of experts on Latino culture and a Latino community layperson reviewed lessons and recipes for cultural sensitivity and appropriateness. Then, a team of two bilingual and bicultural Latino individuals were responsible for the translation of the BOUNCE-related education handouts into Spanish.

After the development of the BOUNCE curriculum, and utilizing fourteen 3rd-6th grade Latino girls and 11 Latino mothers, we pilot tested the following: (1) selected lesson content for the nutrition, self-esteem, and exercise topics (e.g., fun ways to be active at home, fat and sugar lessons, booster self-esteem, and emotional eating lessons); (2) preferences for nine selected physical activities (e.g., yoga, Latin dance, kickboxing, and stretching); (3) structure of program implementation (e.g., duration and time of



**Table 1. Structural Design of the BOUNCE Healthy Lifestyle Program**

	Experimental Group	Control Group
Components	Nutrition Counseling Exercise	Nutrition Counseling Exercise
Duration of Program	12 weeks	12 weeks
Number of Weekly Sessions	3 sessions: Monday, Wednesday, Thursday 36 sessions total	1 session: Friday 12 sessions total
Duration of Session	4:30-6:00 p.m. 1.5 hours	4:30-6:00 p.m. 1.5 hours
Mothers' Weekly Session Sample	Session 1: 45 min nutrition + 45 min exercise	Session 1: 45 min nutrition and counseling + 45 min exercise
	Session 2: 45 min cooking + 45 min exercise	
	Session 3: 45 min counseling + 45 min exercise	
Daughters' Weekly Session Sample	Session 1: 45 min exercise+ 45 min nutrition	Session 1: 45 min nutrition and counseling + 45 min exercise
	Session 2: 45 min exercise + 45 cooking	
	Session 3: 45 min exercise + 45 counseling	
Setting	Group session	Group session
Implementation Site	School: Gymnasium, Classroom, Playground	School: Cafeteria, Classroom Adjacent Park: Community Center, Playground

the day); and (4) barriers to participation in the program (mothers were asked, "What will stop you or other mothers like you from attending the BOUNCE program?"). Major formative results revealed that dance and cheerleading over Pilates and ballet were the girls' favorite physical activities. Nutrition topics were revised to include more hands-on experiential activities. Counseling topics focused on self-esteem. Girls preferred sessions in English and exercise sessions with their peers rather than with their mothers. Mothers preferred walking, stretching, and dance sessions over kickboxing. Although mothers rated highly all nutrition topics, they suggested that cooking lessons would be highly desirable. Mothers requested more information about normative development of adolescents (e.g., physical, cognitive, and social development) and com-

munication. Mothers preferred BOUNCE lessons in Spanish.

Participants suggested that the BOUNCE program be implemented as an after-school program with duration of 1-2 hours. Child care and low literacy skills were identified by the mothers via verbal communication (e.g., "What will stop mothers like you attending BOUNCE program") as major barriers for participation. These formative findings were incorporated into the revised BOUNCE program. Thus, the focus of the revised BOUNCE exercise program would be primarily centered on dance. Furthermore, mother-daughter sport team activities such as basketball will be included to promote bonding. The revised BOUNCE program will include cooking and food demonstrations and normative expectations of adolescents and communication issues. Handouts

with visual cues and limited text and child care for siblings will be provided. Maternal and daughter's level of acculturation will be taken into consideration in program planning, so that the program will be delivered giving consideration for preferred language and cultural orientation. Acculturation is a process in which individuals whose primary learning has been in one culture adopt the characteristics and ways of living (e.g., attitudes, values and language) from the hosting culture.<sup>23</sup>

#### **Program Revisions**

The BOUNCE program included nutrition education, counseling, and exercise components (see Table 2 for a description of the topics and content). Nutrition education had three goals: (1) reduce intake of sugar sweetened beverages and increase water consumption; (2) reduce saturated fat consump-



tion through healthier snacking and cooking methods (e.g., removing fat from homemade soups or stews); and (3) assist participants in developing healthy eating strategies when dining away from home. The nutrition component was presented by combining both content-based lectures and participatory activities (e.g., food preparation) that took into account the culture and literacy level of participants. All topics were reinforced with practical activities (e.g., measuring the amount of sugar and fat included in various foods), games, written materials, and food preparation and tasting sessions.

The behavioral component had three goals: (1) create awareness of positive physical attributes to enhance acceptance oneself; (2) address perceptions and distorted thoughts about food, body weight, and exercise; and (3) teach effective communication, problem solving techniques, and coping strategies to handle new challenging situations. Additionally, this component included behavioral modification strategies to promote the adoption and maintenance of healthy habits including: (1) stimulus control to identify and replace situations that trigger eating; (2) dietary and exercise goal setting; (3) management plans that included intrinsic and extrinsic rewards; and (4) role modeling. Collages, journaling, worksheets, handouts, cooperative learning groups, trust exercises, and culturally sensitive activities were also utilized to teach participants about positive body image and assertive communication skills.

The exercise component included a variety of fun physical activities of moderate to vigorous intensity and focused on a participatory approach to allow participants to use various pieces of exercise equipment (e.g., jump ropes, resistant bands, and hula hoops). Two exercise sessions per week were designed to incorporate intermittent aerobic conditioning (e.g., Salsa, Samba, Hip Hop dance, and step aerobics) and resistance training with resistance bands and body weight resistance. A third exercise session included team sports activities (e.g., basketball) or recreational free play. Each exercise session consisted of a 5-minute warm-up

and 5-minute cool-down before and after the activities, and included stretching, walking, or light jogging. The physical activities entailed continuous movement with minimal standing in an effort to maintain a safe elevated heart rate. Principles of progression including specificity and duration were utilized to individualize the exercise components in an effort to optimize participation and fitness improvement. Participants also received informative handouts to reinforce discussed concepts including tips on how to be more active at home and away from home, identification of barriers to physical activity, and effective physical fitness goal setting strategies.

### *Theoretical Framework*

Evidence suggests that interventions based on theoretical framework are more effective than atheoretical approaches.<sup>24</sup> The design of the BOUNCE intervention program was based on the Social Cognitive Theory (SCT). According to the SCT, behavior change may be mediated or moderated by a number of individual (e.g., self-efficacy), social, and environmental factors which all operate as interacting determinants.<sup>25-26</sup> Following are examples of how the BOUNCE program has applied SCT constructs to the curriculum: (1) *skill-based* sessions to develop ability to perform the behavior when desired (e.g., learning a new motor skill, communication skill or ways to cut fat from diet); (2) *self-efficacy* or the confidence to perform a specific behavior under a variety of circumstances (e.g., feel confident to make healthful selection at a restaurant); (3) *expectations positive outcome* (e.g., having more energy and enjoyment after exercise); and (4) *self-control* by setting behavioral change goals, monitoring one's own behavior, rewarding one's self when goals are attained, and engaging in problem solving. Key social and environmental variables<sup>26</sup> included positive role modeling (e.g., parents, Latino instructors, peer group activities, and group leaders).

### *Measures*

Program outcomes are not presented in this paper. Only demographic, accultura-

tion and process evaluation measures will be discussed. Before the program started, mothers and daughters responded individually to a demographic instrument that assessed their age, date of birth, place of birth, self-described ethnicity, education level, and number of siblings/children living in the family home. In addition, mothers provided information about the annual family income, their occupation, and preferred language spoken with spouse and children.

Maternal acculturation was determined by the predominant language spoken with their spouse and children. Acculturation of the daughter was assessed using the Short Acculturation Scale for Latino Youth,<sup>27</sup> which comprised of 12 items measuring familial and extra-familial language use and ethnic and social relations in Latino youth. Items were rated on a five-point Likert scale where the acculturation score was determined as an aggregate of the responses from each of the 12 items. A high score ( $\geq 55$ ) was indicative of a more Americanized orientation, a medium score (40-55) was indicative of a bicultural orientation, and a low score ( $< 40$ ) was indicative of a Latino orientation. Internal consistency of the scale was excellent with a coefficient alpha=0.94.

### *Process Evaluation*

Process evaluation measures included documentation of the program attendance rates; instructor's evaluation of the program; participant's assessment of BOUNCE activities, content, and instructors; and overall satisfaction with the program. Attendance of mothers and daughters was recorded for each class session. Percentage of weekly attendance was calculated as the number of days that participants attended per week divided by the number of days that the BOUNCE program was offered, multiplied by 100. This result was averaged across participants. Participants who came late, or left early, were recorded as having attended for that entire session. For each lesson, an instructor assistant monitored the amount of material covered and evaluated each lesson for relevance, helpfulness, and participant's enjoyment of the material. To identify barriers that prevented families from attending



**Table 2. Nutrition, Behavioral Counseling, and Exercise Topics and Content Covered in the BOUNCE Program<sup>1</sup>**

Week	BOUNCE Component	Topics	Content
1	Nutrition	Heart healthy fiesta cooking demonstration	Preparation of brown rice and bean soup and tuna salad, review of heart healthy cooking techniques
	Counseling	Welcome: Getting to know you and each other	Kick-off Welcome Fiesta; Welcome participants, have each participant interview each other, establish BOUNCE team credibility, discuss purpose and objectives of the program; Create a buddy system
	Exercise	Report card for your health	Personal evaluation of pre-measurement findings; Discuss core exercise components: cardio, strength & conditioning, & flexibility; Mother-daughter participation in a Hip-hop dance, Latin dance
2	Nutrition	Healthy eating and cooking demonstration	Components of food guide pyramid, created food guide pyramid bracelets representing food groups with corresponding number of servings; Proper hand washing and prepared low-fat quesadillas with corn tortillas
	Counseling	Let's talk about women's health issues	Discuss major women's physical milestone in puberty, adolescence, and adulthood; Relation between obesity and diabetes and certain cancers
	Exercise	What does exercise mean to you?	Participants engage in Hip-hop dance, Latin dance, kickboxing/sports principles of strength training
3	Nutrition	Less sugared-beverages and more water; cooking demonstration	Water consumption, measure sugar content of popular beverages, take home challenge with journal entry; Preparation of fruit smoothies without sugar
	Counseling	Road to a healthy life	Use the roadmap to a healthy life to describe choices we make regarding our body, consequences of choices, and detours that arise during the course of lifetime; use of green light, red light, and yellow light to describe health promoting or health deleterious behaviors
	Exercise	Get your body moving	Introduction of specific cardio, strength & flexibility activities; Participants engage in Hip-hop dance, Latin dance, kickboxing/sports
4	Nutrition	Healthy snacking and cooking demonstration	Identify healthy and unhealthy snacks, measure fat content of various unhealthy snacks, testing will power with cookies, take home challenge including journal entry; Knife skills, preparation of fruit and vegetable salsa
	Counseling	Reaching goals and dreams	Discuss the importance of goals and guidelines to set them up; Using visual cues to identify a health-related goal, resources and barriers to achieve such goal
	Exercise	Get your muscles moving	Emphasizing importance of resistance training to the muscles, bones, & body in general; Distribution of resistance bands; Participants engage in Hip-hop dance, Latin dance, kickboxing/sports



**Table 2. Nutrition, Behavioral Counseling, and Exercise Topics and Content Covered in the BOUNCE Program<sup>1</sup> (con't)**

Week	BOUNCE Component	Topics	Content
5	Nutrition	Fiber and cooking demonstration	Promote benefits of fiber, identify high fiber foods, take home challenge including journal entry for increasing dietary fiber; Preparation of whole wheat pancakes
	Counseling	Perception and attitudes about food and exercise	Use of collages to discuss family and cultural values related to food and exercise
	Exercise	Reaching flexibility	Emphasizing importance of flexibility exercises to the muscles, bones, & body in general; Introduction of Yoga principles and technique; Participants engage in Hip-hop dance, Latin dance, and yoga
6	Nutrition	Bigger is not better and cooking demonstration	Demonstrate appropriate portion sizes of various food groups, oversized restaurant portions with take home challenge and journal entry; Preparation of Mexican rice with vegetables, demonstrating appropriate portion size of rice
	Counseling	Triggers and emotional overeating	Identify triggers to overweight and suggestions to deal with triggers and emotional overeating; Discuss strategies to deal with triggers or emotional eating
	Exercise	Healthy weight	Discussion of normal weight and BMI; Continuation of cardio, strength & flexibility components; Participants engage in Hip-hop dance, Latin dance, kickboxing/sports
7	Nutrition	Food labels and grocery shopping tour	Shopping Tour; Identify parts of the food label, serving sizes, servings per container, review of ingredient list; Promoted fresh items around the perimeter of the store, comparing foods in various sections of the store: meat, dairy, cereal, frozen, food budgeting
	Counseling	Body image: How do I look?	Describe how mother and child see themselves; Identify positive physical attributes; Awareness of cultural and family influences on body image
	Exercise	Overcoming barriers to physical activity	Discussion of barriers related participant population while introducing strategies to overcome those barriers; Continuation of cardio, strength & flexibility components Participants engage in Hip-hop dance, Latin dance, kickboxing/sports
8	Nutrition	Energy balance and cooking demonstration	Calorie concept demonstrated with the amount of calories needed to burn of one M&M®, various activities to balance calories of various foods, weight gain and loss with take home challenge and journal entry; Preparation of fruit and yogurt parfait
	Counseling	Self-esteem: How do I feel about myself?	Discuss definition of self-esteem; Influences on determining self-esteem such as familial and cultural determinants
	Exercise	Burning calories	Energy balance and calorie consumption pertaining to weight loss and weight maintenance; Continuation of cardio, strength & flexibility components; Participants engage in Hip-hop dance, Latin dance, sports



**Table 2. Nutrition, Behavioral Counseling, and Exercise Topics and Content Covered in the BOUNCE Program<sup>1</sup> (con't)**

Week	BOUNCE Component	Topics	Content
9	Nutrition	Dairy and bone health and cooking demonstration	Benefits of calcium, osteoporosis, sources of calcium, taste comparison of whole, 2%, 1%, and skim milk with take home challenge and journal entry; Preparation of fruity pudding cups using whole milk and 1% milk to detect any taste differences
	Counseling	Boosting self-esteem	Discuss ways to boost self-esteem in oneself and daughter
	Exercise	Do's and don'ts to fire up your metabolism	Explaining the importance of eating a balanced diet & resting your body; Continuation of cardio, strength & flexibility components; Participants engage in Hip-hop dance, Latin dance, sports
10	Nutrition	All about fat and cooking demonstration	Identify foods high in saturated fat and trans fat, identify healthy fats, measure fat content of various foods, take home challenge with journal entry; Cooking techniques to reduce fat, preparation of chicken soup with beans
	Counseling	Maintaining healthy habits	Discuss the importance of monitoring and identifying triggers to overeat or to engage in sedentary behavior; Discuss importance of social support in maintaining healthy habits
	Exercising	Fad diets and excessive eating and exercising	Introduction of fad diets, why they don't work; Eating disorders and dangers of excessive exercising; Continuation of cardio, strength & flexibility components; Participants engage in Hip-hop dance, Latin dance, kickboxing/sports
11	Nutrition	Dining out and cooking demonstration	Strategies to reduce fat and calories while dining out at various restaurants, simulated activity to reinforce strategies; Preparation of grilled chicken salad, discussion of healthy salad ideas
	Counseling	What is typical of an adolescent?	Physical, cognitive, social development of adolescents: roles and expectations
	Exercise	Exercise and relaxing	Incorporation of breathing techniques and value of exercise for relaxation & meditation; Continuation of cardio, strength & flexibility components; Participants engage in Hip-hop dance, Latin dance, kickboxing/sports
12	Nutrition	Menu planning and cooking demonstration	Breakfast promotion, inclusion of 5 fruits and vegetables through out day, beverages, healthy snacking, plan a menu for a day; Preparation of oatmeal topped with low-fat yogurt and various fruits
	Counseling	Strategies that promote effective communication	Positive parenting strategies employed with adolescents; Mother-daughter communication exercise
	Exercise	Your personal exercise program	Informed participants of specific ways to achieve their personal health & fitness goals; Program conclusion and celebration including Latin dance, Hip-hop dance, and team sport activities; Participants engage in Hip-hop dance, Latin dance, kickboxing/sports

<sup>1</sup> Social Cognitive Theory Key Elements emphasized in the topic and content of each BOUNCE component include: Role Modeling, Knowledge, Skill building, Positive Outcome Expectation, Self-Efficacy, Goal Setting, Contingencies



classes, instructors asked mothers “What will stop you or other mothers like you from attending the BOUNCE program?” Mother and daughter’s evaluation of the BOUNCE program was conducted at the six-week midpoint and end of the program via survey data. The midpoint survey included open-ended questions and measured the most helpful and enjoyable sessions for nutrition, counseling, and exercise (weeks 1-6), and listing BOUNCE activities they were performing at home to improve their diet and physical fitness. The end-of-the-program survey included open-ended questions measuring the most helpful and enjoyable sessions in the program for nutrition, counseling, and exercise (weeks 7-12), rating the BOUNCE activities and instructors, listing BOUNCE activities they were performing at home to improve their diet and physical fitness, and overall program satisfaction. Each survey used using a five-point scale indicating (1=“boring” to 5=“excellent”).

## RESULTS

### *Demographic and Cultural Characteristics*

Of the 46 mother-daughter pairs (EG=26 and CG=20) enrolled in the BOUNCE program, 35 pairs (EG=18, CG=17) completed the program. Of the eleven pairs (24%) who dropped out, two pairs dropped out of the program due to religious reasons; three due to health reasons (i.e., surgery, spouse’s illness, and pregnancy); and six due to conflict with job schedule. Baseline characteristics of daughters and mothers are shown in Table 3. Except for age, place of birth and grade, mother-daughter pairs in the experimental treatment and control groups had similar demographic characteristics. While daughters’ mean age was similar between EG and CGs (ten years old), mothers’ mean age was statistically different across EG (33 years old) and CGs (38 years old). Most of the experimental daughters attended 3<sup>rd</sup> and 4<sup>th</sup> grade, whereas the control daughters attended 5<sup>th</sup> and 6<sup>th</sup> grade. The majority of the daughters (82%) were born in the United States while the majority of the mothers were born in Mexico (71%). Participating mothers had low levels of income and educational attain-

ment (i.e., 68% with at least 8<sup>th</sup> grade level education). Most of the mothers ( $\geq 70\%$ ) preferred to communicate in Spanish. Although daughters scored low in acculturation suggesting a strong Latino orientation, they preferred their lessons and assessments in English. To accommodate participants’ language preference, BOUNCE sessions for the mothers were primarily in Spanish and those for the daughters were in English. Mother-daughters attended four sessions together and eight sessions apart. This way we could observe the interaction of the daughters with their mothers, the mothers with other mothers, and the daughters with other daughters while answering questions and role playing. When mother-daughter pairs were together, mothers were observed often directing their child’s movement and daughters seemed to be preoccupied with parental approval. Daughters also expressed their preference for exercising with their peers rather with their mothers. Daughters often stated, “It was not cool to be dancing with their mothers all the time. Besides, they move too slowly”. However, exercise sessions in which mother-daughters competed with other mother-daughters during a sport or physical activity elicited greater enthusiasm on their part. When mother-daughters participated together in nutrition and counseling sessions, we observed daughters being significantly quiet. However, when the topic was on cooking or communication, having mother-daughter together in the classroom was especially helpful.

### *Process Evaluation*

The BOUNCE program was implemented from February through May 2006 to allocate sufficient time for research activities (e.g., recruitment, program implementation, and measurement sessions) and school activities (e.g., holidays, field days, testing preparation, and testing). Moderate levels of participation were maintained during the 12-week BOUNCE program. The average attendance of the daughters in the experimental group was 61% and was 64% in control group (Figure 1). The slightly lower attendance of daughters in the experimental group was due, in part, to the

mandatory school tutorials that four of the girls were required to take during the course of the BOUNCE program. Even though the attendance average was similar between both treatment groups, experimental daughters’ attendance was more consistently stable per weekly session than those of the control daughters. The average attendance of mothers was 56% and 50% in the experimental and control groups, respectively (Figure 2). The median number of mothers attending BOUNCE program in the experimental and control group was 10 and 8, respectively. Average attendance of mothers was lower than that of their daughters in both groups. The lower attendance of mothers was due primarily to conflict with maternal or spousal working schedule.

Several strategies were employed to encourage participants’ active participation in the BOUNCE program. For instance, at the start of the program, each participant received a binder, a BOUNCE logo t-shirt, and a BOUNCE logo water bottle. The binder which included a welcome letter, initial handouts, challenges, and take-home recipes was designed such that the participants could collect educational material to create their binder portfolios. Mothers that actively engaged in class participation and achieved their nutrition or exercise goals or had exceptional attendance received rewards such as kitchen utensils, grocery shopping list magnets, measuring cups, and bags filled with groceries. Similarly, daughters received incentives such as bracelets, note pads, pens, balls, hula hoops, and hair accessories. A kick-off *Fiesta*, graduation celebration, and a beauty session were held during the course of the program to motivate and acknowledge participants’ achievements. Mothers and daughters were contacted immediately by phone after missing a session and received missing information by mail and, in some cases, delivered materials directly to the homes of the participants.

### *Instructor Evaluation*

Instructors rated most of the lessons highly for relevance and helpfulness (EG mean rating  $4.5 \pm 0.8$ ; CG mean rating  $4.3 \pm 0.7$ ). Instructors rated highly the maternal



**Table 3. Demographic Characteristics of the BOUNCE Healthy Lifestyle Program**

Characteristics	Daughters			Mothers		
	Experimental Group (N=26)	Control Group (N=20)	P-value	Experimental Group (N=26)	Control Group (N=20)	P-value
Age (mean yrs±SD)	9.9 (1.1)	10.4 (1.1)	0.123	33.3 (4.6)	38.2 (10.6)	0.041*
Grade Level 3 <sup>rd</sup> & 4 <sup>th</sup> 5 <sup>th</sup> & 6 <sup>th</sup>	19 (73.1) 7 (26.9)	6 (33.3) 12 (66.7)	0.009*	N/A	N/A	
Birth Place US Mexico Central America	16 (64.0) 5 (20.0) 4 (16.0)	19 (100.0) 0 (0.0) 0 (0.0)	0.035*	0 (0.0) 15 (57.7) 11 (42.3)	0 (0.0) 17 (85.0) 3 (15.0)	0.001*
Level of Education < 8 <sup>th</sup> grade Some H.S. H.S. Graduate Some college or Vocational/technical	N/A	N/A		20(76.9) 3 (11.5) 2 (7.7) 1 (3.9)	12 (60.0) 6 (30.0) 1 (5.0) 1 (5.0)	0.458
Current Occupation Employed Housewife/Unemployed	N/A	N/A		9 (34.6) 17 (65.39)	3 (15.0) 17 (85.0)	0.192
Average Family Income 0 - \$9,999 \$10,000 – \$19,999 ≥\$20,000 - \$29,999	N/A	N/A		9 (34.6) 11 (42.3) 6 (23.1)	5 (25.0) 10 (50.0) 5 (25.0)	0.776
Language with Spouse Only English Mostly English Bilingual Mostly Spanish Spanish only	N/A	N/A		0 (0.0) 0 (0.0) 2 (9.5) 3 (14.3) 16 (76.2)	2 (10.5) 0 (0.0) 1 (5.3) 2 (10.5) 14 (73.7)	0.462
Language with Children Only English Mostly English Bilingual Mostly Spanish Spanish only	N/A	N/A		0 (0.0) 0 (0.0) 3 (11.5) 5 (19.2) 18 (69.2)	2 (10.0) 1 (5.0) 3 (15.0) 3 (15.0) 11 (55.0)	0.345
Acculturation Scale Low Moderate High	24 (92.3) 0 (0.0) 2 (7.7)	15 (78.9) 3 (15.8) 1 (5.3)	0.109	N/A	N/A	

Data are presented at N (%) except for age. \*significant difference between participants in the experimental and control groups, respectively. N/A means data that do not pertain to that participant group.

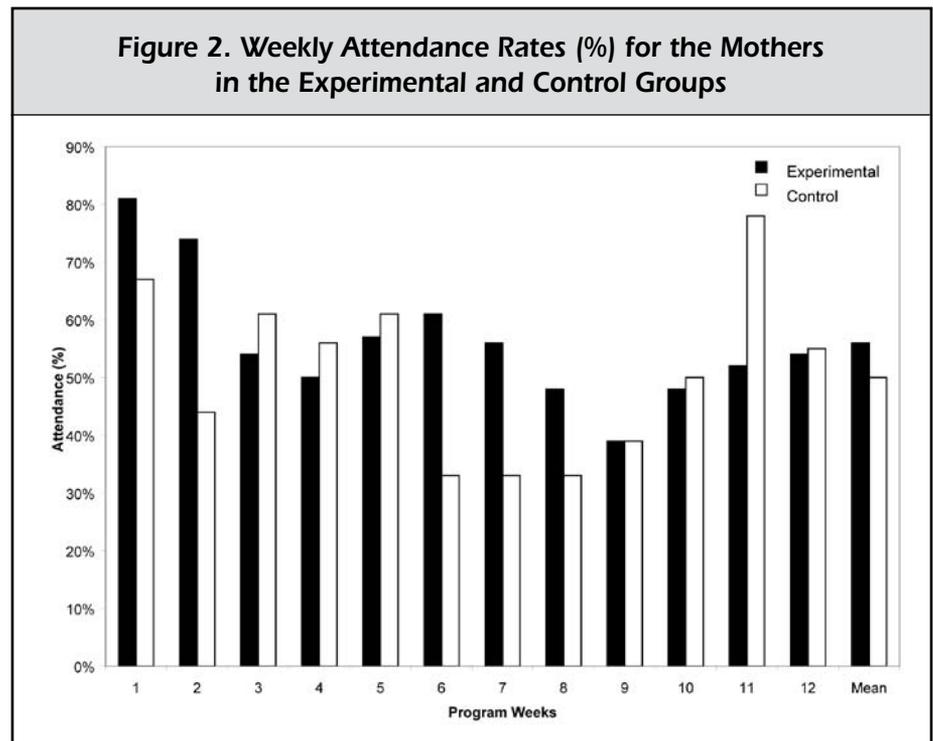
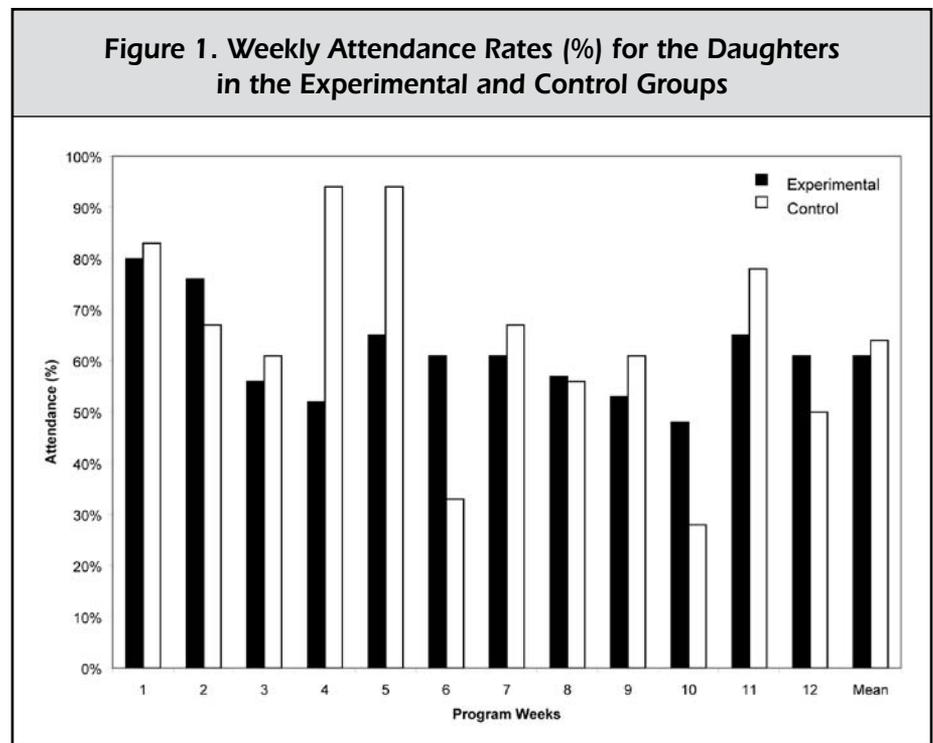


(EG mean rating  $4.5 \pm 0.5$ ; CG mean rating  $4.4 \pm 0.6$ ) and daughter's (EG mean rating  $4.5 \pm 0.6$ ; CG mean rating  $4.4 \pm 0.7$ ) enjoyment of BOUNCE components. In particular, instructors rated the grocery shopping tour and beauty sessions as the highest enjoyable activities by the mothers. Cooking and dancing activities were the most enjoyable activities for girls and the fiber lesson was the least enjoyable. It is noteworthy that mothers felt very comfortable discussing personal tragedies (i.e., death of a child, and past abusive relationships with parents and spouses) in class session (EG 35% CG 30%). Mothers reported to instructors that child care, inconsistent maternal and spousal working schedule, religious beliefs (e.g., viewed dancing as sinful), and after school tutoring for their daughters as the major barriers to active participation. Instructors also identified several topics that were difficult for the mothers to understand such as food label reading, the conversion of sugar consumption into fat, and the value of skim milk vs. whole milk.

**Daughter Evaluation**

Twelve daughters (EG=6, CG=6) and 22 daughters (EG=12, CG=10) answered surveys at the midpoint and end of the program respectively. The daughters reported that the nutrition-related activities they most enjoyed and found helpful included cooking (EG 35%) and food tasting (CG 45%). Among their favorite counseling activities they particularly enjoyed having a diary/journal to write down their feelings, personal events, and thoughts (approximately 65% both groups). They also reported enjoying the discussions regarding diverse body sizes and the role of media and peers in shaping and influencing their perceptions of body size (EG 25% and CG 30%). Among their favorite exercise activities was dancing (EG 65% and CG 70%).

In response to the question about *listing of BOUNCE activities they were performing at home to improve their diet and physical fitness*, EG daughters (10%) reported that they learned about making healthy choices at home, at the school cafeteria, and at restaurants. They also reported learning healthier



ways to cook, and to stop consuming some sugared juices such as SunnyD (EG 50%). Thirty percent of daughters reported drinking water instead of soft drinks and eating smaller portion sizes. Daughters reported playing basketball and soccer (15%), general

playing outdoors (e.g., hula-hoop, jumping rope) (25%), riding bicycle (10%), and dancing (45%) as ways to be active at home. CG daughters reported eating healthier, but not specific behavior changes in their eating habits were stated. However, in terms



of physical activity level, a high percentage of them (70%) reported participating in a cheerleading class offered at the school.

### Maternal Evaluation

Twenty mothers (EG=10, CG=10) and 17 mothers (EG=11, CG=6) answered surveys at the midpoint and end of the program respectively. The nutrition education materials that were more enjoyable and helpful to the mothers included the grocery shopping tour (EG 45%) and food tasting (EG 35% and CG 30%). Interestingly, mothers reported that the grocery shopping tour was extremely helpful in teaching them about recommended portion size, reading food labels, and reducing dietary fat and sugar products in their purchases. Several mothers reported that after class their daughters would ask them to go shopping to buy ingredients for preparing a food recipe that was taught in the BOUNCE program. Among the most helpful counseling components mothers reported was learning ways to enhance not only their own self-esteem, but also that of their daughter's (EG 35% CG 30%), and discussions on raising children within two cultures (EG 25% CG 20%). Mothers rated salsa and samba classes (EG 35% CG 20%) as their favorite activities and kickboxing as their least favorite activity. In response to the question about *listing the BOUNCE activities they were performing at home to improve their diet and physical fitness*, they reported drinking water more often, instead of sodas (EG 15% CG 20%), juices such as Tampico® (EG 20% CG 5%), and drinking skim milk or 1% milk (EG 30% CG 5%).

### Mother-Daughter Bonding

Mothers stated that performing fun events with their daughters increased the bond between them as they felt that they could relate better to their daughters and vice versa. This mother-daughter bonding experience was captured by the following maternal and daughter's comments: "I think our daughters were surprised that we could play basketball. They did not realize that we could play like them." (Mom; age 36; personal communication; May 2006) "Playing games with my mom and competing with

others was fun." (Daughter; age 12; personal communication, May 2006) "I like playing basketball with my mom before BOUNCE class. She is a good player." (Daughter; age 11; personal communication; May 2006) My daughter did not know that I used to play sports like basketball when I was her age. She was surprised to see me playing. Now, before BOUNCE class I take my two daughters and we play basketball in the park for about 45 minutes before we come to the BOUNCE classes. ( Mom; age 34; personal communication, March 2006)

### BOUNCE Program Ratings

In general, 85% of mothers-daughters rated program activities very high (i.e., liking the activities a lot) and rated the instructors and the overall BOUNCE program as excellent. Recommendations provided by participants regarding improvements for future BOUNCE programs included increasing the length of the sessions and including more dance and sport activities.

## DISCUSSION

This intervention program demonstrates the feasibility and acceptability of the BOUNCE healthy lifestyle program designed specifically for Latino mothers and daughters. As originally proposed, the BOUNCE program was implemented during the after-school time period for 12 weeks in school and community settings. Seventy-six percent of participants completed the program with attendance rates higher in daughters than in mothers in the respective experimental and control groups. When compared with other short-term family-based nutrition or physical activity interventions designed for minority families, our intervention program reported remarkable higher program adherence rates.<sup>19, 28</sup> Furthermore, no significant differences in the rate of attendance were observed with increase frequency of sessions (one session vs. three sessions per week) suggesting that three sessions did not deter participation. A variety of factors that may have contributed to this high adherence rate are noted. First, the program was offered immediately after school and in a community setting familiar and close to the residence

of the participants. Second, child care was provided to 36 siblings. Third, the content and intensity of the program was closely monitored for relevance, helpfulness and enjoyment. Fourth, mothers and daughters received social support from buddies and instructors. And fifth, incentives were used to reward participants for achieving goals and consistent attendance.

Acceptability of the BOUNCE program activities was very high. Participating daughters and their mothers rated both the experimental and control program components and instructors positively. The acceptability of the BOUNCE implementation may be due, in part, to the inclusion of culturally appropriate components (e.g., ethnic foods and Latin dancing) that addressed the specific needs of participants. Furthermore, the BOUNCE program was designed and implemented with an emphasis on cost-effectiveness to staffing needs and inclusion of existing resources in the communities (e.g., community centers, parks, and program space used in schools for existing after-school programs).

Two significant barriers that were identified during the formative assessment of the BOUNCE intervention, and were addressed in the pilot program, included the need for child care of siblings and the level of literacy among the mothers. Three additional barriers to consistent participation (e.g., religious beliefs that dancing is viewed as a sin, inconsistent maternal and spousal work schedule, and after-school mandatory tutoring) were identified during the course of the implementation of the BOUNCE program. Identifying and addressing these barriers during the developmental stages of the intervention strengthened the design of this intervention program so as to limit attrition and increase weekly participation. Future healthy lifestyle interventions should invest the necessary time during the formative preparation to address any barriers before conducting the full intervention.

The BOUNCE program has several unique features including an innovative approach that takes advantage of natural interactions occurring across generations



of women, such as Latino mother-daughter pairs. This approach capitalizes on the similar habits, beliefs, motives, and challenges faced by women across generations related to lifestyle behaviors.<sup>9</sup> This approach is not only cost-effective for the program staff, but can provide increased social support for promoting healthy habits within the family. An additional strength of the BOUNCE program is that this multi-level program was developed based on a theoretical framework and process evaluation.

Several limitations of this intervention program are worth mentioning. The small sample size and self-selection of the sample may limit the generalizability of the use of the BOUNCE program to other Latino subgroups. It is possible that families were more motivated to participate due to body weight or other health concerns. The fact that all participants were not involved in the evaluation is another weakness of the intervention program. Another limitation is the lack of a no-treatment control group. While a no-treatment control condition is always optimal and preferable, our experiences with the school community convinced us that a no-treatment comparison would generate antagonism and deter recruitment. As a result, we opted for an “active placebo” condition<sup>29</sup> which involves certain “active” elements in the control group. This type of design has been used previously in the design and evaluation of healthy lifestyle programs for minority adolescent girls.<sup>30</sup>

Despite these limitations, this BOUNCE pilot program contributes significantly to our understanding of the feasibility and acceptability of family-based healthy lifestyle programs targeting intergenerational mother-daughter pairs. To our knowledge, the BOUNCE program is the first family-based healthy lifestyle program that targets Latino mother-daughter pairs. This type of research is crucial, given that obesity prevention interventions targeting minority and low-income populations are sparse and often characterized by high attrition rates.<sup>31-34</sup> The present program contributes to the body of literature by providing information to researchers and health

educators on how to improve the success rate of healthy lifestyle programs for Latino mothers and daughters.

### TRANSLATION TO HEALTH EDUCATION PRACTICE

The following recommendations for health educators are suggested:

- The use of a family-based approach that involves Latino mother-daughter pairs to promote a healthy lifestyle
- The use of a multi-level intervention based on a theoretical framework
- The inclusion of formative and process evaluation measures to assess pilot intervention before implementation of full intervention
- The inclusion of cultural aspects of the Latino culture in the design of the intervention. Some of these cultural elements include: Latino food, Latin music, educational material available in Spanish, and use of Latino bilingual instructors or role models
- Identification of barriers (e.g., child care needs, inconsistent parental working schedules, low literacy, and competing school activities) during the developmental stages of the intervention to limit attrition
- Future healthy lifestyle interventions should include a randomized clinical trial design with a larger sample size and no-treatment control condition.

### ACKNOWLEDGEMENTS

This research was funded by the University of Houston Grants to Enhance and Advance Research Program, St. Luke’s Episcopal Health Charities, and Kraft Foods, Inc. The authors would like to thank the daughters and mothers for participating in the BOUNCE Program. The school administration and physical education teachers played a key role in the recruitment of participants and allowing access to the school and associated school and community facilities to hold the BOUNCE program.

### REFERENCES

1. Dehghan M, Akhtar-Danesh N, Merchant AT. Childhood obesity, prevalence, and prevention. *J Nutr* 2005;4:24.

2. Ogden CL, Flegal KM, Carroll MD, et al. Prevalence and trends in overweight among US children and adolescents. *JAMA*. 2002;288:1728-32.

3. Ogden CL, Carroll MD, Curtin LR, et al. Prevalence and trends in overweight and obesity in the United States. *JAMA*. 2006;295:1549-55.

4. Flegal KM, Carroll MD, Ogden CL, et al. Prevalence and trends in obesity among US adults. *JAMA*. 2002;288:1723-27.

5. Crawford PB, Story M, Wang MC, et al. Ethnic issues in the epidemiology of childhood obesity. *Pediatr Clin North Am*. 2001;48:855-78.

6. Richie LD, Welk G, Styne D, et al. Family environment and pediatric overweight: what is a parent to do? *J Am Diet Assoc*. 2005;105:S-0-S79.

7. Olvera N, Sharma S, Rodriguez A, et al. BMI tracking in Mexican American children in relation to maternal BMI. *Ethn Dis*. 2007;17:707-713.

8. Tanasescu M, Ferris AM, Himmelgreen DA. Behavioral factors are associated with obesity in Puerto Rican children. *J Nutr*. 2000;130:1734-42.

9. Marcus BH, Williams DM, Dubbert PM, Sallis JF, King AC, Yancey AK, et al. Physical activity intervention studies. *Circulation*, 2006; 114:2739-2752.

10. Ransdell LB, Talyor A, Oakland D, et al. Daughters and mothers exercising together: effects of home and community-based programs. *Med Sci Sports Exerc*. 2003;35:286-96.

11. Warren JM, Henry CJK, Lightovler HJ, et al. Evolution of a pilot school programme aimed at the prevention of obesity in children. *Health Promo Int*. 2003;18:287-296.

12. Caballero B, Clay T, Davis SM, et al. Pathways: a school-based, randomized controlled trial for the prevention of obesity in American Indian school children. *Am J Clin Nutr*. 2003;78:1030-38.

13. Harvey-Bernio J, Rouke J. Obesity prevention in preschool Native-American children: a pilot study using home visiting. *Obes Res*. 2003;11:606-11.

14. CATCH – Coordinated Approach to Children’s Health Online. Available at: <http://www.sph.uth.tmc.edu/catch/about.htm>. Accessed December 6, 2005.

15. Great Body Shop. Available at: <http://>



www.thegreatbodyshop.net/. Accessed February 23, 2007.

16. Trevino RP, Hernandez AE, Yin Z, et al. Effect of the Bienestar health program on physical fitness in low-income Mexican-American children. *Hispanic Journal of Behavioral Sciences*. 2005;27:120-132.

17. Neumark-Sztainer D, Story M, Hanna PJ, et al. New Moves: a school-based obesity prevention program for adolescent girls. *Prev Med*. 2003;37: 41-51.

18. Hahn-Smith AM, Smith JE. The positive influence of maternal identification on body image, eating attitudes, and self-esteem of Hispanic and Anglo girls. *Int J Eat Disord*. 2001;29:429-40.

19. Ogden J, Steward J. The role of the mother-daughter relationship in explaining weight concern. *Int J Eat Disord*. 2000;28:78-83.

20. Thomas H. Obesity prevention programs for children and youth: why are their results so modest? *Health Educ Res*. 2006;21:783-95.

21. Baranowski T, Baranowski JC, Cullen KW, et al. The fun, food, and fitness project (FFFP): The Baylor GEMS Pilot Study. *Ethn Dis*. 2003;12:Suppl 1:S30-9.

22. Stolley MR, Fitzgibbon ML. Effects of an

obesity prevention program on the eating behavior of African American mothers and daughters. *Health Educ Behav*. 1997;24:152-64.

23. Hazuda HP, Haffner SM, Stern MP, Eifler CW. Effects of acculturation and socioeconomic status on obesity and diabetes in Mexican Americans: The San Antonio Heart Study. *Am J Epidemiol*. 1988;128: 1289-1301.

24. Sorenson JR, Steckler A. Improving the health of the public. A behavior change perspective. *Health Educ Res*. 2002;17:493-494.

25. Bandura A. *Social Foundation of Thought and Action: A Social Cognitive Theory*. Englewood, California: Prentice-Hall, Inc, 1998.

26. Baranowski T, Cullen KW, Nicklas T, et al. Are current health behavioral change models helpful in guiding prevention of weight gain efforts? *Obes Res*. 2003;11:23S-43S.

27. Barona A, Miller JA. Short acculturation scale for Hispanic youth: a preliminary report. *Hispanic Journal of Behavioral Sciences*. 1994;16:155-62.

28. Baranowski T, Simons-Morton B, Hooks P, et al. A center-based program exercise change among black-American families. *Health Ed Q*. 1990;17:179-86.

29. Shapiro AK, Morris LA. The placebo

effect in medical and psychological therapies. In: Garfield SL, Bergin AE, eds. *Handbook of Psychotherapy and Behavior Change*. New York, NY: John Wiley & Sons; 1978:369-410.

30. Robinson TN, Killen JD, Kraemer HC, et al. Dance and reducing television viewing to prevent weight gain in African American girls. The Stanford GEM pilot study. *Ethn Dis*. 2003;13: Suppl 1:S65-77.

31. Summerbell CD, Waters E, Edmunds LD, et al. Interventions for preventing obesity in children. *The Cochrane Database Syst Rev*. 2005 Jul 20;(3):CD001871.

32. Yancey AK, Kumanyika SK, Ponce NA, et al. Population-based interventions engaging communities of color in healthy eating and active living: a review. *Prev Chronic Dis*. 2004; A09.

33. Yancey AK, Jordan A, Bradford J, Voas J, Eller TJ, Buzzard M, et al. Engaging high-risk populations in community-level fitness promotion: ROCK! Richmond. *Health Promot Pract*. 2003; 4(2):180-188.

34. Poston WSC, Haddock CK, Olvera N, et al. Evaluation of a culturally-appropriate intervention to increase physical activity. *Am J Health Behav*. 2001;25:396-406.