CHILD- AND PARENT-TARGETED INTERVENTIONS: THE MEMPHIS GEMS PILOT STUDY

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Objective: To assess the feasibility, acceptability, and outcomes of 2 versions of a culturally relevant, family-based intervention to prevent excess weight gain in pre-adolescent African-American girls.

Design: Three-arm, 12-week parallel group randomized controlled pilot trial.

Setting: Community centers in Memphis, Tennessee.

Participants: Sixty African-American girls, aged 8 to 10 years, with a body mass index (BMI) ≥25th percentile of the CDC growth charts, along with their parents/caregivers.

Interventions: The active interventions involved highly interactive weekly group sessions with either girls (child-targeted program) or parents/caregivers (parent-targeted program). Content focused on knowledge and behavior change skills to promote healthy eating and increased physical activity. The comparison intervention focused on global self-esteem.

Main Outcome Measures: Given the lack of power and the limited time frame of the pilot study, outcomes were evaluated on the basis of implementation measures and changes in physical activity (accelerometer data), and in consumption of sweetened beverages and water, as estimated from questionnaires. Changes in body mass index, waist circumference, and body composition were also examined.

Results: The Memphis GEMS pilot intervention met all recruitment, retention, implementation, and participation goals, and was given high ratings by both participants and interventionists. With respect to the comparison intervention, girls in both the child-targeted and parent-targeted interventions demonstrated a trend toward reduced body mass index and waist circumference. In addition, girls in the active intervention groups reduced their consumption of sweetened beverages by 34%, increased their level of moderate-to-vigorous activity by 12%, and increased their servings of water by 1.5%.

Conclusions: The findings from this pilot study demonstrated the feasibility, perceived acceptability, and efficacy of culturally relevant, obesity prevention interventions for pre-adolescent African-American girls and their parents/caregivers. (*Ethn Dis.* 2003;13[suppl1]:S1-40–S1-53)

Key Words: Weight Gain, Prevention, Obesity, African-American Girls, African-American Families, Nutrition, Physical Activity, Behavioral Intervention

INTRODUCTION

The disproportionate prevalence of obesity in African-American women[1] is a major public health concern, which—has escalated with the overall increase in obesity in the US population.[2] A particularly troubling facet of the recent trend toward increased obesity is that the age of onset of obesity in African-American females, formerly young adulthood, is now younger. The prevalence of obesity in African-American girls aged 6–19 has doubled since the 1960s, and now supersedes the rate for their White counterparts.[3]

Effective models for obesity prevention in African-American pre-adolescent girls are critically needed. Such interventions must be age- and developmentally appropriate, as well as culturally appropriate; that is, aligned with the relevant demographic, psychosocial, and cultural characteristics. The need for cultural tailoring has been increasingly recognized in recent years.[4–8] Optimally, the identification of relevant tailoring variables and their application in program design and implementation involves needs assessment and pilot testing with the study population. For example, previous weight-related studies have indicated that when compared to their White counterparts, African-American girls: are more satisfied with their body size;[9] tend to receive maternal messages that they are too thin, which often results in attempts to gain weight;[9] are less physically active;[10] view more hours of television per day;[10,11] consume a higher percentage of meals while watching television;[12] have a higher fat and sodium intake compared to White girls; and eat fewer vegetables, fruits, and whole grains than suggested by the recommended daily guidelines.[13,14] These and other variables would be relevant to the tailoring of interventions regarding physical activity and nutrition.

This article describes the development and pilot evaluation of two culturally tailored, family-based interventions that were designed specifically to prevent excess weight gain and obesity in pre-adolescent African-American girls. This 12-week pilot study, conducted in Memphis, Tennessee, was one of four such studies conducted in Phase 1 of the Girl's health Enrichment Multisite Studies (GEMS).[15] The two interventions conducted in Memphis had similar objectives and formats, with one intervening directly with the 8- to 10-year-old girls, and the other intervening with parents or caregivers as potential mediators of the girls' behavior changes. Our decision to conduct an active intervention involving parents only, in addition to the program for girls, was based on 3 main factors: 1) a relative

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paucity of studies which provide a "gold standard" for the design of weight gain prevention interventions with African-American girls, especially in the pre-adolescent age range; 2) studies with younger and older African-American girls that suggest the relevance of direct parental involvement;[16–18] and 3) the work of Golan and Wezman,[19,20] which suggested that involving parents without their children might have beneficial effects, such as providing the opportunity to prepare them to be potential mediators of behavior change in their children's dietary intake and physical activity patterns. Unlike some of the studies mentioned above, however, our GEMS parent-targeted intervention did not include a parental weight control goal. We were interested primarily in parents as mediators of outcomes for children.

THEORETICAL FRAMEWORK AND RATIONALE

The Memphis GEMS intervention was guided by the general theoretical framework of Social Cognitive Theory (SCT);[21] by theoretical and empirical evidence supporting the use of a family-based approach to obesity prevention in children, both in general and particularly in African-American children; and by a conceptualization of family influences on children's weight-related behaviors informed by family systems theory.[20,22] SCT is the most common theory used in successful dietary behavior change interventions targeted toward children.[23] Based on the premise that cognitive processes are key factors in the determination of motivation, affect, and behavior, this theory incorporates many components of motivational models, as well as models based on environmental influences. Key foci in SCT-oriented interventions include developing knowledge and skills needed to change behavior, expecting positive outcomes in association with behavior change, developing self-efficacy in performing new behaviors, and learning self-regulatory skills.[24]

The use of family-based approaches in treating children is strongly supported in the obesity treatment literature.[19,25] Family members and family interactions can be readily conceived as either facilitators or barriers to weight gain prevention. An example of the latter is found in a report from the National Heart, Lung and Blood Institute (NHLBI) Growth and Health Study in which more African-American girls than White girls were trying to gain weight.[9] The best predictors of trying to gain weight were being African-American, and having mothers telling the girls they were too thin. Treatment in parent-child dyads—which offers an opportunity to engage parents directly in a supportive effort—has been a model of intervention adopted and advocated by researchers,[16,17,19,20,26,27] and is successful when compared to no-treatment controls.

Of particular relevance to the approaches tested in the Memphis GEMS pilot study is the work of Golan et al.[19,20] These authors conducted a 12-month randomized trial in which only parents participated directly in the intervention (although advice was geared to the entire family), with a control condition in which only children were involved.[19] Although children in both groups lost weight at a similar rate initially, the eventual outcomes in the parents-only group were more favorable.

The special relevance of family-based approaches to obesity prevention in African-American children has also been established. Mothers, with support from extended family members, are considered to be the primary influence on African-American children and youth from preschool through high school,[28–30] and the socio-cultural context of the African-American girl involves a much higher degree of interdependence among family members in African-American compared to White families.[29,30] For example, Treiber et al reported strong relationships between children's exercise and family support for exercise, particularly among African-American women.[31] Iannotti et al found that peer influences were second to parental influence on healthy food consumption by preschool African-American children.[32] Further, several studies have shown that dietary social support from family members may encourage healthy dietary adherence among African-American adolescents, particularly girls.[33,34]

METHODS

An overview of methods common to the pilot studies across the 4 GEMS field centers is included elsewhere in this supplement.[35] In this article, we briefly summarize these overall methods and present, in detail, the intervention design and implementation methods specific to the Memphis GEMS pilot study. All study procedures were approved by the University of Memphis Institutional Review Board on Human Subjects.

Study Design and Participant Recruitment

Our pilot study was implemented as a 12-week, 3-arm controlled trial contrasting 2 active, culturally tailored, and family-based interventions (child targeted intervention with girls only, and parent-targeted intervention with parents only) focusing on nutrition and physical activity, with a comparison group that focused on self-esteem. Because the 12-week intervention period was insufficient for the observation of significant changes in BMI (the ultimate primary outcome of interest), we formulated hypotheses in relation to changes in indicative measures of physical activity and diet after the 12-week intervention. Specifically, we hypothesized that, judged against the comparison group, the 2 active interventions would result in a 10% increase in minutes of moderate-to-vigorous physical activity (MVPA), a 10% decrease in sweetened beverage con-

sumption, and a 10% increase in water consumption. Since there is minimal guidance in the literature on size of the expected changes in an abbreviated weight gain prevention intervention with pre-adolescents, we arbitrarily assigned significance to a 10% behavioral change.

African-American girls aged 8–10 years and their parents/caregivers were eligible to participate. Although age-eligible siblings were allowed to attend the intervention sessions, only one girl per household was randomized into the study. Additional eligibility criteria were that girls be at or above the 25th percentile of age- and sex-specific BMI based on the 2000 CDC growth charts,[36] and be able to participate in physical education classes in school. Girls and their families were recruited through public service announcements on several local African-American radio stations, participation of GEMS investigators in live radio talk shows, and flyers distributed at local elementary schools. Further details regarding our recruitment strategies are described in another article in this supplement.[37]

Interventions

Active Interventions

The family-based GEMS interventions piloted in Memphis were newly developed based on the theoretical frameworks discussed earlier, the relevant scientific literature, and extensive formative assessment activities (focus groups, key informant interviews, and surveys of 8–10 year old African-American girls and their parents).[38,39] The outcomes reported related to food intake and physical activity patterns, recognizing that these might be different on weekends and weekdays. The girl's body image was also an outcome of interest, although not directly targeted in the intervention. Body image was assessed as a related variable that might influence or be influenced by an intervention on diet and physical activity. The focus was on modifiable family variables that potentially influence girls' eating and physical activity, and are either mediated through the family, or through the girl's own attitudes, perceptions, and personal choices. Examples of themes extracted from focus group data and their implications for the child and parent-targeted pilot interventions are shown in Table 1. These themes were selected using an informal and iterative coding process of reviewing transcripts and tapes, and incorporating findings into the intervention development.

Parallel objectives between the child- and parent-targeted interventions permitted the examination of two different approaches to increasing healthy eating patterns and physical activity among the 8- to 10-year-old girls. Nutrition and physical activity intervention objectives designed for the long-term Phase 2 trial were assessed in the 12-week pilot study. The objectives of the nutrition component were to: 1) choose a nutritionally balanced eating plan, including the reduction of high-fat food intake (particularly fast foods); 2) increase water consumption/reduce sweetened beverage intake; 3) increase fruit and vegetable intake; and 4) promote nutrition-related healthy behaviors and the recognition of health-compromising behaviors, such as eating while watching television, meal skipping, and snacking when not hungry. For the physical activity component, objectives were to: 1) increase the frequency of moderate to vigorous physical activity; 2) decrease the frequency of sedentary behaviors; and 3) promote enjoyment and self-efficacy in physical activity. Our active interventions were designed with awareness of the importance of positive body image; however, body image was not directly targeted in our interventions. Rather, it was assessed as a safety measure to determine whether the interventions negatively affected body image and/or created unhealthy eating or physical activity practices. Table 2 provides a topical overview of the 12 sessions for each intervention.

Child-Targeted Intervention

Girls randomized to the child-targeted intervention, entitled "GEMS Jamboree," participated in weekly, 90-minute intervention sessions for 12 weeks. Following an introduction component consisting of a welcome and a discussion of the basic concepts for the day (15 minutes), girls participated in "Movin' It" (physical activity component) and "Munchin' It" (nutrition component). Each weekly session concluded with a "Taking It Home" segment (15 minutes) in which the concepts of the day were reviewed, incentives (small gifts) were given, and motivation for healthy eating and the maintenance of physical activity was provided.

Activity components were selected based on a review of the literature,[40,41] and on findings from our focus groups and feasibility study. In accordance with the expressed interest of the girls in music and dance, hip-hop aerobics served as the main activity for the majority of this segment (30 minutes). Using teachable moments during the warm-up, interventionists suggested ways to reduce sedentary activity, such as exercising during commercial breaks.

Using interactive strategies, the nutrition component (30 minutes) incorporated opportunities for girls to experience fruits, vegetables, low-sugar beverages, and low-fat food items while providing the girls with the knowledge and skills necessary to enable them to make healthy lifestyle modifications. Discussions regarding eating while watching television, meal skipping, snacking when not hungry, the recognition of natural satiety levels, and portion control were included. Taste-testing and food preparation activities, food-art, a modified Farmer's Market, and basic label reading skills were included as activities. In addition, healthy snacks and child-friendly recipes were provided at each session.

Parent-Targeted Intervention

Eating and Activity Skills for Youth (EASY) was conducted in a 12-week,

Table 1. Selected focus group findings and related intervention activities

Child Intervention		Parent Intervention	
Child Focus Group Findings	**Related Intervention Activities**	**Parent Focus Group Findings**	**Related Intervention Activities**
Physical Activity		**Physical Activity**	
Strong dislike of traditionally structured P.E. classes (eg, push up, sit ups, running laps, etc)	Included ''fun'' activities for movement Encouraged girls to take ''ownership'' of the program and suggest new activities	Parents enjoy dancing with friends and family members, not seen as a direct form of exercise	Physical activity component included different forms of dance (''dancing to oldies'' and new ''line'' dancing to popular music)
Girls enjoy movement in the form of dance	Incorporation of hip-hop aerobics into the main active component Encouragement of girls to dance/move during commercials when watching TV	Typical family activities and outings do not include physical activity	Information presented in the didactic portion of the physical activity component regarding ways to increase family activity (eg, washing cars, cleaning house to music, walking after dinner, etc)
Younger girls (8–10) expressed an interest in a variety of physical activities (eg, soccer, basketball, kickball, bike riding, etc)	Spotlight/brief discussion of activity alternatives discussed each week Challenge sheets (reward for trying different activities)	Continuous feedback and information regarding lifestyle changes provides support and is instrumental in creating new healthy habits	Goal setting cards were used for parents to select weekly family activities and record their progress
Nutrition		**Nutrition**	
Girls assist their families with meal preparation and often perform microwave cooking alone	Inclusion of weekly food preparation activities with child-friendly recipes Food ''art'' and taste-testing activities to encourage a broad exposure to different fruits and vegetables	Parents are very knowledgeable about nutrition, but lacked information about how to implement this knowledge into their daily practices	Provision of ''tips'' on how to include healthy snacks for kids and modify traditional recipes to make them healthier Nutrition games provided fun ways to learn new strategies (eg, Who Wants to be Health?)
Importance of Sunday family dinners	Messages regarding food moderation were given for times when traditional heavy meals are likely to be consumed	The relationship between weight and health was seen as primarily genetic; lack of acceptance of the connection between behavioral practices and body size	Emphasis on healthy lifestyles, rather than on weight Focus on increased physical activity to promote and maintain health; disease prevention approach
Existence of neighborhood ''candy ladies''	Recognition of an environmental immutable exposure; message regarding frequency of visitation and quantity of candy purchased were presented	Time constraints impacted the preparation of healthy meals Desire to prepare healthier foods that their families would enjoy	Healthy, easy-to-prepare recipes were distributed at every session Hands-on food preparation of kids-friendly recipes were included

90-minute session format that included: a physical activity component of dancing (EASY Moves); a didactic nutrition segment (EASY Tips); and a segment alternating food preparation and nutrition-related games (EASY Fun). The weekly intervention concluded with a session used to reinforce key points and to provide take-home materials (healthy recipes and small thematic incentives related to the weekly concepts). Childcare was provided, with specific activities designed for the 8- to 10-year-old daughters. These activities did not focus on nutrition or physical activity.

The physical activity objectives were addressed through participation in the 25-minute dance segment. Parents/caregivers danced to popular songs from the 70s and 80s, and were encouraged to share popular dances from their youth with their daughters and to learn their daughters' current dances and music.

Approximately 25 minutes were devoted to both the interactive and didactic nutrition components. Discussions regarding the links between nutrition and parental concerns, such as the connections between breakfast consumption and school performance,[42] and between soft drink consumption and dental carries and obesity,[43] were included. Suggestions and strategies to increase healthy family lifestyles were also provided. Cooking activities alternated with games (nutrition or physical activity focused), and were the last segment of the family intervention. Games played during this segment provided parents/caregivers with the opportunity to learn more about nutrition and physical activity topics in an enjoyable, non-didactic manner. In closing, a "wrap-up" (15 minutes) of the information presented during the session was conducted, and

Table 2. Overview of child-targeted and parent-targeted interventions

	Child-Targeted		Parent-Targeted	
Session	**Physical Activity**	**Nutrition**	**Physical Activity**	**Nutrition**
Session 1	■ Hip-hop aerobics ■ Encourage a variety of physical activities	■ Increasing vegetable consumption ■ Make a vegetable salad and stamped napkins	■ Introduction to the ''Old School'' dance	■ Importance of water and F & V consumption
Session 2	■ Hip-hop aerobics ■ Decrease sedentary activities ■ Encourage walking	■ Decreasing sweetened beverages ■ Vegetable tray ■ Low sugar drinks/water ■ Blind taste test	■ Stretching ■ ''Old School'' dance ■ Importance of walking	■ Cooking activity–importance of breakfast consumption ■ Decrease sweetened beverages
Session 3	■ Hip-hop aerobics ■ Exercise with a partner ■ Active games	■ Increase fruit consumption ■ Fruit platter/dip ■ GEMS heart	■ Stretching ■ ''Old School'' dance	■ Nutrition game ■ Low-fat lunch options
Session 4	■ Hip-hop aerobics ■ Using the ''talk'' test when exercising ■ Encourage jogging	■ Increase fruits as snacks ■ ''Snack attack'' bags ■ Fruit/vegetable art	■ Stretching ■ ''Old School'' dance	■ Cooking activity–decrease salt intake and increase use of seasonings
Session 5	■ Hip-hop aerobics ■ Exercise when bored or angry ■ Encourage jump roping	■ Eat a variety of healthy foods ■ ''Ants on a log'' ■ Triscuit pyramid	■ Stretching ■ Line dancing	■ Nutrition game ■ Increase water consumption ■ Low-fat snacks
Session 6	■ Hip-hop aerobics ■ Encourage playing sports	■ Recognize fullness/satiety ■ Satiety demo ■ Bountiful burritos	■ Stretching ■ Line dancing ■ Cleaning to music	■ Cooking activity ■ Label reading
Session 7	■ Hip-hop aerobics ■ Ways to overcome barriers to exercise ■ Encourage stairs	■ Eating a healthy breakfast ■ Make fruit rolls-ups ■ GEMS oven mitts	■ Stretching ■ Line dancing ■ Low-cost/no-cost family	■ Nutrition game ■ Making healthier fast food choices
Session 8	■ Hip-hop aerobics ■ Encourage use of community resources to increase activity ■ Encourage bike riding	■ Eating a healthy lunch ■ Drink more water ■ Turkey roll-up	■ Stretching ■ Line dancing	■ Cooking activity ■ Importance of the family dinner ■ ''Drink less sugar''
Session 9	■ Hip-hop aerobics ■ Decrease sedentary activities ■ Encouarage swimming	■ Eating a healthy dinner ■ Pita pocket pile up ■ Soup basket mix	■ Stretching ■ Dance ■ Importance of daily exercise	■ Nutrition game ■ Veggies and kids ■ Eating while watching TV
Session 10	■ Hip-hop aerobics ■ Decrease sedentary activities ■ Encourage roller	■ Smart snacks ■ Teddy fruit toss ■ Memo book	■ Stretching ■ Dance	■ Cooking activity ■ Low-fat eating ■ Increase water consumption
Session 11	■ Hip-hop aerobics ■ Ways to keep moving	■ Healthy fast food choices ■ Create a better burger	■ Stretching ■ Dance ■ Importance of parental role modeling	■ Nutrition game ■ Portion control
Session 12	■ Hip-hop aerobics	■ Nutrition Twister ■ Vegetable and fruit tray ■ Turkey roll-ups	■ Stretching ■ Dance	■ Healthy snacks ■ Certification/awards

culturally relevant printed information related to the weekly topic was provided to remind participants of the intervention messages.

Comparison Intervention

In order to recruit and retain African-American girls and their parents/caregivers in a randomized intervention study, it is important to ensure that both the active and comparison interventions are viewed as substantive and appealing to potential participants. This is particularly important for a study in the African-American community, involving families that represent a relatively wide socioeconomic range. Randomization to a "no treatment" control group is a particularly difficult concept for participants to accept in communities where the service offered by the study may be otherwise unavailable or inaccessible.[44,45]

Participants randomized to the com-

parison group attended 3 monthly, 90-minute sessions over the 12-week pilot study. The reduction in meeting frequency compared to the active interventions was implemented because the formulation of the control pilot study was limited due to practical constraints. This intervention was designed to enhance and prevent a decline in self-esteem among 8- to 10-year-old girls, and to be neutral with respect to dietary practices and physical activity. Each session consisted of a 15-minute introductory segment (15 minutes), in which the concepts and activities of the day were discussed, two activities (35 minutes each), and a 15-minute closing segment in which the daily activities were reviewed. During the two 35-minute segments, girls participated in arts and crafts, "friendship-building"/social support type activities ("trust games"), and enjoyable games. Nutrition and physical activity were not addressed in this condition. Given the reduced frequency of contact with this group compared with the active intervention groups, personalized greeting cards and general health information were mailed to participants bi-monthly to maintain contact and build rapport.

Measures

Prior to participation in the pilot study, girls and their families completed baseline assessments consisting of several physical and psycho-social measures. All measures were taken at the metabolic laboratory at the University of Memphis after receipt of signed informed consent by parents/caregivers, and assent from the girls. Parents/caregivers were permitted to accompany the girls during the clinic visit. Assessments were conducted at baseline, and repeated at the end of the 12-week intervention, with the exception of the dual energy X-ray absorptiometry (DEXA), which was only performed at baseline. Girls received cash incentives of $25 to complete baseline and follow-up assessments.

Details regarding the GEMS collaborative measures and their rationale are provided elsewhere in this supplement.[35] The GEMS Coordinating Center conducted centralized training for data collection, as well as site-specific training, using the same standard protocol at each GEMS field center. Nutrition data collectors were trained centrally and certified by the Nutrition Coordinating Center at the University of Minnesota.

Height was measured according to standardized procedures with a Schorr stadiometer, with adjustments for hairstyles. Two readings were taken, with height recorded to the nearest 0.1 cm. Weight was measured using standardized procedures for an electronic scale (Seca Model 770), with weight recorded to the nearest 0.1 kg. Waist circumference of the girls was measured to assess changes in abdominal fat in response to the intervention. Two measurements were taken to the nearest millimeter using a non-elastic metric tape. The mean of the 2 measures for height, weight, and waist measures was used. These measurements were taken with girls dressed in lightweight clothing and without socks or shoes.

Percent body fat was estimated from DEXA scans (Hologic QDR 2000), with girls dressed in paper gowns and socks. DEXA has emerged as one of the best methods of assessing body composition because of it is a simple, rapid test to perform, with a low radiation dose, and because the accuracy of the test does not depend on hydration.[46]

Sexual maturation was assessed through direct observation by an African-American female nurse. Stages of breast and pubic hair maturation were assessed using the Tanner scale, with grades from 1 (pre-pubertal) to 5 (fully developed and post menarcheal).[47]

Two dietary recalls were conducted on non-consecutive days. The first recall was conducted face-to-face at the baseline visit, and the second was conducted via telephone within 2 weeks. Parental assistance with reporting food consumption was permitted. Recall data were averaged over the 2 days for nutrients and summed for servings of fruit, juice, vegetables, sweetened beverages, and water.

Physical activity was measured using the Computer Science Applications (CSA) accelerometer. Average daily counts per minute and number of minutes of moderate-to-vigorous physical activity occurring between 12 noon and 6 PM were calculated. Participants were requested to wear the monitors for 3 consecutive days (except during bathing and swimming), and to maintain a record of the times when the monitor was on and off. Additionally, a self-reported recall of the previous day's activities and usual physical activity, using the GEMS Activity Questionnaire (GAQ), was utilized to assess activities performed and the frequency and duration of these activities.[35]

Blood samples were collected to assess insulin sensitivity and glucose levels. Hyperinsulinemia is a risk factor for the future development of type 2 diabetes, and is strongly associated with increased weight in children and adolescents.[48] Additionally, insulin resistance increases during puberty,[49] and, compared with White girls, these levels have been found to be elevated among African-American adolescents aged 11–18 years.[50,51] Therefore, insulin resistance serves as a marker of metabolically significant obesity and changes in weight status.[52]

The collection of serum samples in the pilot study served as a test of the feasibility and acceptability of these measures with our target population. Standard cholesterol analysis results were also provided to participants as a courtesy.

In our study, female pediatric phlebotomists and nurses collected the blood samples. Girls completed a separate consent form for this component of the study, and received an additional $25 monetary incentive for their participation.

Psychosocial Variables

Parents/caregivers and the girls completed questionnaires assessing several

behavioral domains. Reported here are parental/caregiver data on diet-related psycho-social variables, such as overall food preparation practices (low-fat and high-fat food practice), and girls' data on physical activity self-concepts and preferences, sedentary activity preferences, positive expectations, and self-efficacy for physical activity. In addition, body image of the girls was assessed (body figure silhouettes and the McKnight Risk Factor Survey).[53]

Food preparation practices were assessed using a newly developed 25-item questionnaire. Parents were asked to indicate methods they had used to prepare food for their daughters during the past month. In this article, we report findings from two of the subscales: low-fat food practices ("When you served chicken to your daughter, how often did you remove the skin?"), and high-fat food practices ("When you served vegetables, how often did you add butter, margarine or other fat?"). The low-fat food practices subscale included 8 items (α=.59), and the high-fat food practices subscale included 7 items (α=.59). Response options included: "Almost never"; "Sometimes"; and "Almost never."

Physical performance self-concept was assessed using a modified version of the Athletic Competence sub-scale from the Self-Perception Profile for Children.[54] Girls were asked to respond to this 9-item subscale (α=.70) using a paired response format (eg, "I do very well at all kinds of sports" or "I don't do very well at all kinds of sports").

A 37-item physical activity preference measure was used to assess "active" and "sedentary" activities. A modified Likert-type scale included 4 response options: 1) "I've never done it"; 2) "Don't like it"; 3) "Like it a little"; and 4) "Like it a lot." Both physical activity preference (α=.86) and sedentary activity preference (α=.60) scores were calculated.

Physical activity outcome expectations were assessed using a 17-item, modified measure from the Healthy Growth Study (W. Taylor, unpublished data). A single score for positive expectations for physical activity (α=.72) was calculated.

Self-efficacy for physical activity was assessed using a 9-item measure (α=.71) to assess the girls' perceived level of difficulty in engaging in activity. For example, girls were asked: "How hard do you think it would be to be physically active instead of watching television?" Response options included: "Not hard at all"; "A little hard"; and "Very hard."

Modified Stunkard et al[55] body silhouettes were used to assess the body image of the girls. Girls were asked two questions for each set of silhouette drawings: "Which picture looks most like you?" and "Which picture shows the way you would like to look?" Lettered response options were associated with eight body sizes, ranging from very thin to very heavy. A body image discrepancy score was calculated for each girl by subtracting the "like to look" score from the "most like me" score, with a lower value indicating a preference for a larger body size and a higher score indicating a preference for a smaller body size.

Two subscales of the elementary version of the McKnight Risk Factor Survey (MRFS) were used to assess weight control behaviors: Moderate Weight Control Behaviors (MWCB) (α=.77) and Unhealthy Weight Control Behaviors (UWCB) (α=.67).[38] These 2 scales assess exercising, eating less fatty foods, and cutting back on consumption (MWCB); and meal skipping, and starving for a day or more (UWCB). Response options included: "Never"; "Sometimes"; and "A lot."

Interventionist Training

The pilot interventions were delivered by teams consisting of a trained graduate student, and a member of the local community center staff trained as a lay health educator. A 2-day, comprehensive training consisting of didactic and role-playing components was held with the interventionists. The objectives of this training were to: 1) familiarize interventionists with the intervention and related materials; 2) discuss developmental issues related to pre-adolescent African-American girls; 3) address issues related to cultural sensitivity and cultural competence; and 4) cover general safety related issues and procedures and those specific to the community centers. Intervention staff were tested on the content of learned material, particularly protocol issues. Staff were certified after receiving a score of 85% or better. Booster trainings were also held as needed throughout the course of the pilot intervention. During the intervention, weekly, audio-taped debriefing meetings were held with the interventionists and project investigators to troubleshoot any problems with each session and to plan for the following sessions.

Feasibility Study

Given that the interventions were newly developed, we considered it important to test the intervention components prior to the full-scale implementation of the randomized pilot study. We therefore conducted a non-randomized 12-week feasibility study of the 2 active interventions prior to the pilot study. The feasibility study was conducted to identify which components were well received and, therefore, did not require modification, which were well received but needed improvement, and which did not work at all. In addition, the pace, speed, timing, and delivery of the intervention were assessed. Our evaluation of the feasibility study included an assessment of participants' responsiveness to program content. This feasibility study also constituted additional training for the interventionists, since all interventionists from the feasibility study were retained for the randomized controlled 12-week pilot study.

The child-targeted intervention was

tested for feasibility at a local YMCA, and involved 24 girls recruited from after-school programs, and from a nearby elementary school. The parent-targeted intervention was conducted at a community center and included 15 parents who had participated in current or previous programmatic activities at the center.

The child-targeted intervention proved to be well received by the participants, and was associated with a high level of participant satisfaction. However, although the girls enjoyed the physical activity component (pom-pom/cheerleading), we observed that this type of skill-based activity did not engage the girls in a sufficient amount of physical activity. Beginning in the ninth week of the feasibility study, the use of hip-hop aerobics was tested as an alterative. In addition, a separate group cohesion component included in the feasibility study was modified for the pilot study. Developing camaraderie among the participants was found to greatly enhance the comfort level of the girls. However, to allow more time for cognitive, behavioral, and skill-based processes, and activities related to nutrition and physical activity, we incorporated the friendship-building activities into the physical activity and nutrition components (eg, small group hip-hop performances and paired taste-tests).

The parent-targeted intervention was also well received. For the pilot study, minor modifications were made to some of the nutrition-related games and recipes. In addition, flexibility and increased ownership of the intervention by the parents were built into the pilot study by encouraging parental suggestions regarding the type of dances and music utilized in the physical activity component.

Statistical Analysis

Statistical analyses were performed to compare treatment groups with respect to demographic characteristics and important prognostic factors at baseline. For binary and ordinal variables, standard techniques for categorical data were applied, including the Fisher exact test for binary outcomes, and Pearson χ^2 and Mantel-Haenszel procedures for ordinal data. For continuous variables, analysis of variance (ANOVA) was applied.

To determine whether there were between-group differences in outcomes at the 12-week follow-up visit, an analysis of covariance (ANCOVA) model was applied. This analysis was implemented by linear regression for variables expected to have Gaussian errors (eg, BMI) and by Poisson regression for variables expected to have Poisson errors (eg, servings of sweetened beverages). The 12-week follow-up value was used as the dependent variable. Study condition was the only grouping factor, with three levels. The baseline value of the dependent variable, centered about its sample mean, was included as a covariate to increase precision and adjust for any imbalances at baseline.

Post-Intervention Evaluation

Following the conclusion of the pilot study, structured interviews were conducted with a convenience sample of parents/caregivers to gain a better understanding of their initial perceptions of GEMS, and how these perceptions evolved over the course of the study, and to plan for the Phase 2 intervention. These interview sessions were held in conjunction with the post-test assessment sessions and were conducted by a study investigator who was not involved in the direct delivery of the interventions. Questions asked in these interviews were: "What did you think GEMS was when you first heard about it?" "In what ways did GEMS turn out to be what you expected?" "How did GEMS fall short of what you expected it to be?" "What was the most important thing that you learned from GEMS?" and "What did your daughter learn from being in GEMS?" Analysis of these interviews began with a content analysis for each interview item, with the initial classification of comments into major categories. Frequencies and percentages of comments were calculated to provide a general indication of how frequently a response category emerged during the course of the interviews. Participants may have provided multiple comments in response to some questions; hence, the number of comments cannot be directly related to the number of participants.

RESULTS

Recruitment, Retention, and Intervention Attendance

The Memphis field center recruited, assessed, and randomized 60 African-American girls and their parents/caregivers for the Phase 1 pilot study. Demographic and other characteristics of the girls and their parents/caregivers at baseline are summarized in Tables 3 and 4. Means or proportions are presented for each variable, as is the *P* value from the omnibus test for any difference among the 3 groups. The comparison group included slightly younger girls and older caregivers, with a lower proportion of female-headed households; however, only the caregiver age reflected a significant difference. The data in Tables 3 and 4 demonstrate that, overall, our recruitment strategies[37] were successful in reaching the intended target population. For example, 35% of the study population reported total household incomes of less than $20,000 per year, 68% reported total household incomes of less than $40,000 per year, and 50% of girls lived in female-headed households. Among the 3 intervention conditions, 21 participants were randomized to the child-targeted intervention, 21 to the parent-targeted intervention, with 18 being randomized to the comparison intervention.

Retention rates were high. Complete data were collected at follow up for 100% of the study population, with rare

Table 3. Description of characteristics of girls at baseline by treatment group

	Overall (*N*=60)	Child Targeted (*N*=21)	Parent Targeted (*N*=21)	Comparison (*N*=18)	*P* Value
Girl age (yr), mean (SD)	8.9 (0.8)	8.7 (0.8)	9.1 (0.7)	8.9 (0.8)	.24
Height (cm), mean (SD)	141.0 (8.2)	141.9 (6.8)	138.8 (8.5)	142.6 (9.2)	.29
Weight (kg), mean (SD)	47.9 (16.0)	45.9 (13.8)	44.5 (12.8)	53.5 (21.5)	.18
BMI (kg/m^2), mean (SD)	23.7 (6.3)	25.5 (7.4)	23.0 (5.6)	22.6 (5.6)	.55
% Body fat, mean (SD)	35.3 (13.7)	38.8 (14.4)	32.0 (13.7)	35.0 (12.6)	.26
Prepubertal (% stage >1.5–<2.5)	65.0	57.1	66.6	72.2	.96
TV in bedroom (%)	80.0	80.9	80.9	77.7	1.00

exceptions for individual items. Attendance at intervention sessions was also high. Overall, 88% of the participants attended at least 80% of the scheduled intervention sessions (83% child-targeted, 94% parent-targeted, and 89% comparison group).

Post-Intervention Evaluation Results of Pilot Study

Thirty-four post pilot study interviews were conducted: 13 from the child-targeted intervention, 16 from the parent-targeted intervention, and 5 from the comparison intervention. Key results were as follows:

What did you think GEMS was when you first heard about it?—Despite the provision of multiple explanations about the intervention, there was some confusion about the objectives of GEMS. Weight gain prevention was a difficult concept for parents/caregivers to understand. GEMS was perceived as a weight control program or exercise program by 71% of parents, overall (24 of 34 comments), and by 100% of comparison group parents/caregivers (5 of 5 comments).

In what ways did GEMS turn out to be what you expected?—Regardless of their group assignment, the majority of parents indicated that they or their children derived favorable outcomes of some kind from their participation in GEMS. In response to this question, only one parent from the comparison group, one from the parent-targeted intervention, and 2 from the child-targeted intervention, indicated that GEMS was not what they expected. One response from a comparison group parent aroused concern when she indicated that GEMS had provided nutrition information that was very helpful to her: "It made me more aware of what I feed my family, what I actually eat myself, and the portions that we actually have, what's good for you, what's not, and when you compute the calories and the fat, then you can actually eat out without losing any flavor . . .". Given that nutrition and physical activity information was not provided in the comparison group, this comment suggested possible sensitization based on data collection measures.

How did GEMS fall short of your expectations?—Parents of girls in the comparison group were all somewhat disappointed with their daughter's assignment. Since recruitment materials and public service announcements included a discussion of hip-hop aerobics, girls assigned to the comparison group were aware of what they were missing, which led to their disappointment.

For parents/caregivers involved in either of the 2 active-intervention groups, GEMS generally did not fall short of their expectations. However, many of these parents indicated that they would have preferred it if both they and their daughters had been involved in GEMS sessions. For example, a parent from the

Table 4. Description of baseline characteristic of parents/caregivers by treatment group

	Overall (*N*=60)	Child Targeted (*N*=21)	Parent Targeted (*N*=21)	Comparison (*N*=18)	*P* Value
Age (yr), mean (SD)	35.5 (7.2)	33.9 (7.0)	34.2 (6.9)	38.9 (6.9)	.048
Education (%)					
High school graduate or less	11.7	9.5	14.3	11.1	0.97
Tech school/some college	56.7	62.0	61.9	44.4	
College grad/post grad	31.7	28.6	23.8	44.4	
Total household income (%)					
<$20,000	35.0	33.3	38.1	33.3	.089
$20,000–$39,999	33.3	52.3	23.8	22.2	
≥$40,000	31.6	14.2	38.1	44.4	
Female-headed household (%)	50.0	52.4	57.1	38.9	.581
Female single-parent household (%)	36.7	42.9	33.3	33.3	.839
Home ownership (%)	55.0	52.4	52.4	61.1	.849

child-targeted intervention commented: "It would have benefitted me if I could have participated in some of the things that she was going through, not necessarily with her, but somewhere so that I could be interacting with her. Parents would benefit from handouts of what they learned and some of the activities done, because some information went in one ear and out the other."

What was the most important thing that you learned from GEMS?—Increases in nutrition knowledge were seen as a major benefit (59% of parents'/caregivers' comments), and increases in exercise knowledge were mentioned in 5 out of 39 comments. One noteworthy comment from a respondent in the parent-targeted intervention was as follows: "I learned to never give up trying to maintain weight, and how to change your eating habits. I liked the foods that they introduced; they didn't just tell you, they showed you. It is not a focus on weight loss, but on weight maintenance: a more relaxed look at eating and exercise."

What did your daughter learn from being in GEMS?—Improvements in self-esteem or interpersonal relations were seen as key outcomes by parents of girls in the comparison group (3 out of 5 comments), and, to a smaller extent, by parents of girls in the child-targeted intervention (3 of 19 comments). The majority of parents/caregivers in the 2 active intervention groups saw improvements in their daughters' nutrition and exercise knowledge. Comments by 2 members of the parent intervention summed up widely expressed sentiments: "I learned that vegetables can be used as snacks, as opposed to thinking of them as just nasty vegetables. And now she's going, 'can we have carrots and celery'?", and "She's aware of eating more fruits and vegetables than ever before, so it's considered a snack for her now. She's eating healthier because I'm eating healthier. I don't buy things that I normally did buy."

A single common question was asked of girls at each GEMS field center to determine overall satisfaction with the interventions: "I enjoyed participating in the Memphis GEMS intervention." Responses included yes, no, and not sure. An overwhelming majority of participants (94.5%) responded positively regarding their level of satisfaction. In addition, the intervention staff at each GEMS field center was asked: "Overall, how satisfied would you say you were with your participation in the Memphis GEMS project?" One hundred percent of the intervention staff responded positively to this item.

Outcomes

The average baseline-adjusted measures for the several mediators and outcome variables are shown in Table 5, separately for each active intervention group and for the comparison group. Adjusted mean differences and significance, indicated by P values $\leq .05$, refer to the combination of the 2 active interventions vs the comparison intervention. Changes from baseline to 12 weeks (adjusted for baseline values) are shown in Table 6 for the same mediators and outcomes, comparing the two active interventions to each other, and then comparing each, separately, to the comparison group. In interpreting the mean differences in Table 6, a positive value indicates an increased mean for the first intervention group vs the second. Conversely, the negative values indicate a higher value in the second group listed as compared to the first. The negative sign indicates an effect (although usually not significant) in favor of the first treatment listed (eg, the active intervention in question vs the comparison group, or the parent-targeted intervention, when compared to the child-targeted intervention), where intent was for the variable to decrease with treatment, eg, BMI, waist, servings of sweetened beverages). The opposite is true for variables such as the physical activity scores, for which a favorable effect would be shown by a positive sign, reflected in an increase relative to the comparison group or to the child-targeted intervention.

Compared to girls in the comparison group, girls in the active interventions combined demonstrated a trend toward a reduced BMI and waist circumference (Tables 5 and 6). Relative to the comparison group, the 2 active intervention groups, when averaged, demonstrated an 11.7% increase in minutes of moderate-to-vigorous physical activity (MVPA), a 34.1% decrease in servings of sweetened beverages, and a 1.5% increase in servings of water; as such, our expectations were met for physical activity and sweetened beverages, though not for water. As Table 5 shows, the effect on servings of sweetened beverages was significant at $P<.05$, while the effects on physical activity and water were not; the effect of sweetened beverages was driven by the difference between the parent-targeted intervention and the comparison group ($P=.0087$), in that neither of the other 2 pair-wise comparisons were significant. Although both active interventions were favored over the comparison group with respect to the majority of the variables, several outcomes from the parent intervention exhibited a trend toward an increased level of physical activity and fewer calories derived from fat, compared with the child-targeted group.

Several self-reported measures were included to assess psycho-social mediators of change in physical activity and dietary intake, and to test potential moderators of intervention effects. As shown in Table 6, relative to the comparison group, girls in both the child-targeted and parent-targeted groups exhibited trends toward an increased preference for various physical activities tried. Additionally, relative to both active intervention groups, girls in the comparison group demonstrated a trend toward unhealthy behaviors, and excessive concern about weight and shape.

As described previously, the 12-week pilot study was not designed to have

Table 5. Mean values (baseline-adjusted) for selected mediators and outcome variables at 12 weeks, by treatment group

	Child Targeted (*N*=21) Mean (SE)	Parent targeted (*N*=21) Mean (SE)	Comparison (*N*=18) Mean (SE)	Adjusted Mean Difference* (SE)	*P* Value†
Physical measures					
Body mass index (km/m²)	24.3 (0.2)	24.3 (0.2)	24.7 (0.2)	0.0 (0.2)	.22
Waist circumference (cm)	74.0 (0.6)	74.7 (0.6)	75.0 (0.7)	−0.6 (0.9)	.55
Physical activity					
CSA count/min	361.0 (17.3)	387.9 (17.2)	347.3 (18.2)	−18.0 (24.4)	.45
Minutes Mod-Vig PA (12 pm–6 pm)	72.0 (8.2)	78.8 (8.2)	67.5 (8.5)	−6.8 (11.7)	.54
GAQ, met-adjusted usually score dietary intake‡	4.0 (0.5)	4.1 (0.5)	3.8 (0.5)	−0.1 (0.64)	.85
FJ & V servings/day§	2.9 (0.46)	3.13 (0.48)	2.44 (0.46)	0.43 (0.20)	.58
Sweetened beverage servings/day§	2.38 (0.38)	1.52 (0.1)	2.96 (0.46)	1.57 (0.40)	.03
Water servings/day§	1.98 (0.43)	1.35 (0.35)	1.64 (0.43)	1.46 (0.48)	.51
Total energy intake (kcals)	1387 (114.0)	1472 (116.4)	1628 (126.0)	−85.2 (162.9)	.37
Percent calories from fat	36.3 (1.5)	34.9 (1.5)	36.4 (1.6)	1.4 (2.1)	.74
Diet psychosocial variables					
Low-fat food practice	2.0 (0.0)	2.1 (0.0)	2.0 (0.1)	−0.2 (0.1)	.05
High-fat food practice	2.3 (0.1)	2.3 (0.1)	2.3 (0.1)	0.1 (0.1)	.73
Physical activity (PA) psychosocial variables					
PA self-concept	1.3 (0.0)	1.3 (0.0)	1.2 (0.0)	0.0 (0.1)	.36
PA preference	2.6 (0.1)	2.5 (0.1)	2.4 (0.1)	0.1 (0.1)	.11
Sedentary activity preference	2.8 (0.1)	2.8 (0.1)	2.8 (0.1)	−0.0 (0.1)	.98
Positive expectancy for PA	1.2 (0.1)	1.4 (0.1)	1.3 (0.1)	−0.1 (0.1)	.27
Self-efficacy for PA	1.6 (0.1)	1.5 (0.1)	1.7 (0.1)	0.2 (0.1)	.10
Body image/weight concern					
Silhouettes–look like you	4.6 (0.2)	4.3 (0.2)	4.2 (0.2)	0.4 (0.3)	.28
Silhouettes–like to look	3.3 (0.2)	3.2 (0.2)	2.8 (0.3)	0.1 (0.4)	.42
Weight concern–moderate behavior	1.9 (0.1)	1.9 (0.1)	1.8 (0.1)	0.0 (0.2)	.64
Weight concern–unhealthy behaviors	1.2 (0.1)	1.3 (0.1)	1.4 (0.1)	−0.1 (0.1)	.44
Overconcern with weight and shape	1.7 (0.1)	1.7 (0.1)	2.2 (0.1)	0.1 (0.1)	.01

* Adjusted mean differences are reported for the combination of the child-targeted and parent-targeted interventions vs the comparison group.

† *P* values refer to the omnibus test.

‡ Nutrient intake variables (energy and percent calories from fat) are averaged across the 2 diet recalls; food group servings are summed across the 2 dietary recalls.

§ Means and standard errors are predicted by the Poisson Regression Model. Adjusted mean differences are ratios comparing the 2 active conditions versus the comparison condition.

sufficient statistical power to observe outcome differences in physical measures, such as BMI or waist circumference, between the 2 active interventions, either with respect to each other, or to the comparison group. That is, this was not a weight loss intervention for which marked short term changes in body weight or fatness would be expected. Despite this limitation, the direction of the changes was encouraging in that it favored the active interventions in most cases.

Adverse Events and Injuries

Few adverse events and injuries were reported among the pilot study participants in Memphis. For example, during the 12-week intervention, injuries were reported by 2 girls (11%) in the comparison group, and one girl (4.7%) in the child-targeted group. Similarly, adverse events (problems requiring a visit to a healthcare provider) were reported by one girl (5.5%) in the comparison group, and 2 girls (9.5%) in the parent-targeted group. None of the above adverse events were judged by the Coordinating Center to be related to study participation, but the Center deemed 2 of the injuries to be possibly related to participation in the intervention. Lastly, an elevated cholesterol value was reported for one participant, with notification made to the family.

DISCUSSION

The principal objective of this pilot study was to assess the feasibility and acceptability of the proposed study methods, including recruitment, data collection, and interventions, and to determine whether the interventions were promising for weight gain prevention. Overall, the study was implemented as designed, was well received by participants, and both active interventions were associated with some level of behavior change in the expected directions. Recruitment and retention goals were fully met, and the levels of participation in the intervention met prespecified criteria for success,[37] with the

Table 6. Differences (baseline-adjusted) in selected mediators and outcome variables at 12 weeks, comparing the active interventions to each other and, separately, to the comparison group

	Parent-Targeted vs Comparison Mean Difference (SE)	*P* Value	Child-Targeted vs Comparison Mean Difference (SE)	*P* Value	Parent-Targeted vs Child-Targeted Mean Difference (SE)	*P* Value
Physical measures						
Body mass index (kg/m^2)	−0.40 (0.25)	.11	−0.38 (0.25)	.14	−0.03 (0.24)	.91
Waist circumference (cm)	−0.39 (0.94)	.68	−1.03 (0.95)	.28	0.65 (0.91)	.48
Physical activity						
CSA count/min	31.6 (24.95)	.21	13.7 (25.18)	.59	18.0 (24.42)	.47
Minutes Mod-Vig PA (12 pm-6 pm)	11.3 (11.85)	.35	4.45 (11.82)	.71	6.81 (11.75)	.56
GAQ, met-adjusted usually score	0.38 (0.67)	.58	0.29 (0.67)	.67	0.09 (0.06)	.89
Dietary intake*						
FJ & V serving/day†	1.29 (0.31)	.30	1.20 (0.29)	.47	1.08 (0.24)	.74
Sweetened beverage servings/day†	0.51 (0.13)	.001	0.80 (0.18)	.31	0.64 (0.17)	.09
Water servings/day†	0.82 (0.31)	.60	1.20 (0.41)	.59	0.68 (0.23)	.25
Total energy intake (kcals)	−153 (175)	.38	−242 (170)	.16	85.2 (163)	.60
Percent calories from fat	−1.47 (2.21)	.51	−0.07 (2.21)	.98	−1.40 (2.11)	.51
Diet psychosocial variables						
Low-fat food practice	0.11 (0.07)	.15	−0.06 (0.07)	.41	0.17 (0.07)	.02
High-fat food practice	−0.05 (0.10)	.64	0.03 (0.10)	.78	−0.07 (0.09)	.43
Physical activity (PA) psychosocial variables						
PA self-concept	0.07 (0.06)	.28	0.09 (0.07)	.17	−0.02 (0.06)	.75
PA preference	0.11 (0.09)	.24	0.19 (0.09)	.04	−0.08 (0.08)	.34
Sedentary activity preference	0.0007 (0.0799)	.99	−0.02 (0.08)	.85	0.02 (0.08)	.84
Positive expectancy for PA	0.04 (0.09)	.64	−0.10 (0.09)	.29	0.14 (0.09)	.11
Self-efficacy for PA	−0.21 (0.11)	.06	−0.02 (0.11)	.82	−0.18 (0.10)	.08
Body image/weight concern						
Silhouettes–look like you	0.06 (0.30)	.83	0.44 (0.30)	.15	−0.38 (0.29)	.20
Silhouettes–like to look	0.37 (0.37)	.31	0.46 (0.37)	.22	−0.09 (0.35)	.81
Weight concern–moderate behavior	0.12 (0.18)	.52	0.17 (0.18)	.36	−0.05 (0.17)	.78
Weight concern–unhealthy behaviors	−0.08 (0.15)	.57	−0.19 (0.15)	.20	0.11 (0.14)	.46
Overconcern with weight and shape	−0.53 (0.14)	.0004	−0.44 (0.14)	.0027	−0.09 (0.14)	.53

* Nutrient intake variables (energy and percent calories from fat) are averaged across the 2 dietary recalls, food group servings are summed across the 2 dietary recalls.
† Mean and standard errors are predicted by the Poisson Regression Model. Adjusted mean differences are ratios.

exception of blood draws. Given historical distrust of medical research among some African Americans,[56] and based on our prior experience in the Memphis community concerning the enormous local sensitivity to issues of research involving blood measures and ethnicity, we included a 2-stage informed consent process to limit the potential impact that requesting blood samples would have on recruitment and participation. In the first consent, participants agreed to become a part of the intervention, to random assignment to treatment, and to all of the laboratory and paper-pencil measures, except the blood draws. A second consent form was presented which specified blood measures as an option, with an additional monetary incentive offered. Furthermore, female pediatric phlebotomists and nurses with substantial experience with young patients were hired to provide a more comfortable clinical environment. Despite these efforts, only 3 participants provided blood samples in the pilot study. However, contrary to our assumption that parental refusal would be the major problem, several parents whose daughters were reluctant to provide blood samples would have given permission.

Our pilot study design allowed us to explore the feasibility of separate interventions targeted to parents and children, and to evaluate and compare the short-term effects of these interventions on potential mediators of weight change. Treatment of parents and children together has been typical, at least for younger children.[26] The participants' preference for a girls-and-parents joint intervention is also supported by findings of Wadden et al from their study in African-American adolescents. Their treatments involved treating a mother and child together or separately, in concurrent sessions. Outcomes were better in the sessions with the mother and child treated together, and the joint sessions seemed to be more interactive and more enjoyable for the mothers and

daughters. Of interest with respect to possible cultural differences, Brownell et al found the opposite in a prior study that used the same design among White girls.[57] In that study, weight losses were larger in interventions with the parents and children treated separately, both initially and after 1-year of follow up.

As noted earlier, our interest in testing the feasibility of a parent-mediated approach to reaching 8- to 10-year-old girls was influenced by the earlier cited promising results of Golan et al,[20] and had some intuitive appeal as a "train the trainer" type of approach, leaving the specifics of how to best modify each girl's behavior to her parent or caregiver. The pilot study results indicated that both the parent-targeted and child-targeted interventions were somewhat, and similarly, effective in facilitating the desired changes in the girls' behavior over the short term. Although it might have been interesting, scientifically, to pursue the question of whether a differential effect between the 2 interventions might have emerged over a longer time period (as suggested in the Golan study, which was conducted in Israel[20]), our observations during pilot study and from the post-intervention evaluations suggested that, for these African-American girls and their families, combining the 2 interventions, with some allowance for separate sessions, would be better received than the separate intervention approaches. This strategy was also very appealing from a resource and statistical power perspective, since it results in a 2-arm design, and avoids the need to provide childcare during the parent sessions. In addition, findings from our post-intervention evaluation indicated that parents/caregivers were not only interested in participating in the interventions with the girls, but also indicated that their presence would better aid the girls in making lifestyle changes.

Therefore, the second phase of GEMS, scheduled to begin in 2002, will consist of a 2-year trial to evaluate the short- and long-term ability of these intervention approaches to prevent obesity in pre-adolescent girls. The Memphis design will be a 2-arm randomized trial in which a joint parent and child intervention will be implemented. Program format and content for the child and parent components of the active intervention will build upon the successful approaches used in the pilot phase, making selected modifications to merge the 2 programs and to incorporate changes based on Phase 1 feedback. The comparison intervention will focus on individual self-esteem and social efficacy. A focus on self-esteem was incorporated into the pilot study comparison treatment, as suggested by a study which demonstrated the decrease in self-esteem experienced by girls as they physically mature, and during the transition from elementary school to junior high.[58] This apparently applies particularly to African-American girls, who tend to physically mature earlier.[59] The focus on social efficacy was added to reflect Bandura's recent discourse on the issue of SCT from the perspective of human agency,[60] and Spencer's phenomenological variant of ecological systems theory, which integrates the concept of human agency with the child developmental theories of Brofenbrenner.[61]

The Phase 2 GEMS trial should provide information regarding the efficacy of a long-term joint parent-child weight gain prevention intervention focusing on pre-adolescent African-American girls in a community setting. Given the increasing prevalence rates of overweight and obesity among this population group,[3] successful interventions and actions for the prevention of obesity are critically needed.[2]

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The previous chapter describes universal and widely available interventions designed to strengthen parenting and support parents of young children. This chapter turns to evidence-based and evidence-informed interventions used in a variety of settings (e.g., health care, education, the home) with some evidence of effectiveness in supporting parents and parenting knowledge, attitudes, and practices among (1) parents of children with special needs; (2) parents facing special personal and situational adversities; and (3) parents who have in some way been involved.Â Study findings showed that the intervention reduced parentsâ€™ depressive symptoms, but not their stress levels.