A Culturally Tailored, Faith-Based Approach to Reducing Pediatric Obesity in Minority Families: Strong Me!

Ruth Williams1*, Michelle B Stockton1,2, K. Brooke Beck1,3, Robin Roach1,4, Marian Levy5 and Janice Pride-Boone6

1Health and Sports Science, Field House 106, The University of Memphis, Memphis, USA
2Associate Professor, The University of Memphis, Memphis, USA
3Clinical Dietitian, The Church Health Center, Memphis, USA
4Associate Professor, The University of Memphis, Memphis, USA
5Associate Professor and MPH Director, School of Public Health, The University of Memphis, USA
6Medical Director of Strong Me, USA

Introduction

In 2010, nearly one-third (32%) of American children were considered overweight [1]. Childhood obesity alone is responsible for $14.1 billion in direct costs [2] and produces a host of psychosocial and educational implications. Weight-based teasing of overweight and obese adolescents has been linked to increased susceptibility to depression [3]. Moreover, teachers perceive overweight students as less likely to succeed on homework and more likely to have family problems [4].

Childhood obesity is linked with a seventy percent chance of becoming an overweight or obese adult, which has both immediate and long term physical, social, and emotional health consequences (i.e., low self-esteem, hypertension, and type 2 diabetes) [5-7]. The need to develop effective interventions targeting childhood obesity is immediate.

Factors related to adolescent obesity

Numerous demographic, environmental, societal, and genetic factors are related to childhood obesity. Specifically, factors such as race, income and activity level have been linked to obesity. A survey, based on the 2007 National Survey of Children’s Health (NSCH), found that overweight adolescents were more often African American or Hispanic rather than Caucasian, male, were less physically active, live in an unsafe neighborhood, and lived in a household with an income below 100% of the Federal poverty level [8]. In 2007, 16.4% of U.S. children were obese and 31.6% were overweight. From 2003 to 2007, obesity prevalence increased by 10% for all U.S. children but increased by 23%-33% for children in low-education, low-income, and higher unemployment households. Obesity prevalence increased markedly among Hispanic children and children from single-mother households. In 2007, Hispanic, non-Hispanic Black, [corrected] and American Indian children had 3.0-3.8 times higher odds of obesity and overweight than Asian children; children from low-income and low-education households had 3.4-4.3 times higher odds of obesity than children from higher socioeconomic households. The magnitude of racial/ethnic and socioeconomic disparities in obesity and overweight prevalence increased between 2003 and 2007, with substantial social inequalities persisting even after controlling for behavioral factors [8].

Weight is also affected by familial and cultural norms, environment, environmental factors, and commercial messaging. Management of pediatric obesity requires a social-ecologic approach [9], which includes individual, family and an understanding of the role of the child’s environment in food choices. Thus, health behaviors are impacted by the interaction and integration of factors within and across organizations and social structures.

Obesity treatment in adolescents and children

The majorities of available treatments for childhood obesity combine diet and exercise [10]. The Academy of Nutrition and Dietetics (formerly the American Dietetic Association) recommends the following: reduce energy intake while maintaining adequate calories to promote the growth and development; increase the child’s energy expenditure through physical activity; and involve parents/caregivers as agents of change. Current research from this professional group shows that behavioral approaches combined with family support to be effective [11].

Family and faith-based interventions

Weight interventions that are family and faith-based have shown some success, such as improved weight status and even reduced cardiovascular risk [12]. However, comprehensive family-based programs reporting positive long-term outcomes have had limited participation of minority youth. An intensive family-based lifestyle intervention focused on inner-city minority children was Yale Bright Bodies Weight Management Program [10]. Bright Bodies compared their program to the conventional clinical weight management program that involved 135 overweight children during the course of a 12 month study. The Bright Bodies group showed no weight gain, a decrease in body fat, and reduction of BMI over the period of twelve months.

Incorporating faith into the intervention may serve to enhance the benefits of weight loss within a specific culture. Fitzgibbon et al., [12] tested the relative efficacy of a 12 week culturally tailored, faith-based weight loss intervention against a culturally tailored weight loss intervention with no active faith component. The faith based component showed favorable results. Musgrave et al., [13] reported on studies indicating that spirituality may influence self-esteem, sense of belonging, and sustaining valued health behavior. People who claim spirituality and religiosity have shown lower blood pressure, decreased depression, and better immune function. However, most faith-based programs reported were directed at adults, not children.

Purpose

The purpose of this study was to determine the efficacy of StrongMe!, a 12-week weight reduction program for African American children that is family-oriented, culturally-based and incorporated motivational...
interviewing and non-denominational spirituality combined with nutrition education and exercise.

Methods

Research design

This study was a one group repeated measures design with BMI as the primary outcome measure. Secondary outcomes were abdominal girth and BMI z-scores.

Recruitment and eligibility

Participants were recruited to the program via free radio advertisements, postings at churches and community centers, physician referrals and word of mouth. Participants were eligible if they were

1. 6-18 years old at program onset,
2. overweight or obese, defined by the Centers for Disease Control age-sex specific criteria as having a BMI > 85th percentile for gender and age, and
3. had a guardian who would participate in the intervention.

Eligibility criteria were evaluated, and medical approval was obtained from their primary care physician. Parents or caregivers gave written informed consent, and children assented. Parents/caregivers and participants completed the intervention together. The intervention took place in an urban setting in the southeastern US. The protocol was approved by the Institutional Review Board at the University of Memphis.

Intervention

StrongMe! is a culturally tailored, faith-based, family-oriented intervention integrated nutrition education, exercise, motivational interviewing, and non-denominational spirituality to support healthy lifestyle choices. Twelve structured group sessions were held for children and their guardians weekly over 15 weeks. Sessions were taught by physicians, dietitians, exercise instructors and interfaith counselors, experienced in teaching and working with children. All health professionals were experienced in their field and attended two training sessions on the StrongMe! program. The pediatrician was certified in marriage and family therapy, and trained in motivational interviewing and cognitive behavioral therapy. Participants met at two facilities: a church fellowship hall and a community center. The 12-week curriculum was based on the theoretical framework of Social Cognitive Theory [14]. Marian fix this taking into account the physical, social, family, and cultural environment in which children lived. Opportunities for modeling, role rehearsal, and environmental support were provided.

Additionally, motivational interviewing techniques were used with families to discuss factors contributing to childhood obesity, including participants’ genetics, family dynamics, community influences, and the macrosystems of food access, delivery, and the media. Families were encouraged to read a weekly meditation together and reflect for the week on topics such as comfort, patience, temptation, courage, etc. A family-based approach was utilized. The program was culturally sensitive to African Americans in several ways. The music used for work out sessions was drawn from Memphis City Schools Radio Station. Over half of the staff was from the communities served, and the curriculum used vernacular common to Memphis. Meals were modified to be Memphis friendly, i.e., barbeque, greens, but foods were made healthier by the use of less fat and salt and appropriate portion sizes. Special attention was paid to holidays so that families could eat according to their cultural norms, only healthier.

Program sessions were faith-based and focused on healthy eating, decreasing sedentary behavior, increasing physical activity, and increasing family support. Each meeting included measurement of weight, height, waist circumference, blood pressure, a review of the child’s weekly food log, an exercise session of yoga and/or zumba, a lesson related to nutrition, health, or behavior modification, and a meal. The menus were written by a registered dietitian.

The curriculum outline was developed by a pediatrician specifically for a minority population to incorporate a non-denomination faith. The pediatrician was certified in marriage and family therapy where motivational intervention was taught. The intervention was based on a modified 12-step model to incorporate faith when making lifestyle changes. Each lesson was opened with the Serenity Prayer, and concluded with The Lord’s Prayer. Families were asked, with permission, to use the God of their understanding to aid in their choice to move away from high energy foods to more plant-based foods/meals lower in salt, sugar and fat. Participants asked for help with their journey into weight loss and getting healthier and used prayer and motivation as a way to assist them in their efforts. Participants were instructed on the 5,2,1,0 approach; where participants were told to eat 5 fruits and vegetables a day, limit screen time to 2 hours a day, participate in 1 hour of activity a day and limit sodas and sugared drinks to 0 a day. The program was culturally tailored (i.e., the intervention delivery, types of food served, as well as recipes given) to African-American families. Each week the lesson was followed up with a midweek call for reinforcement, and to discuss/help work through barriers. Treatment fidelity was evaluated via direct observations by the Project Director.

Measurements

The following self-reported data were collected on each child pre and post intervention: food habits, exercise habits and anthropometric characteristics (BMI, abdominal girth, height, weight) were measured. Baseline and follow-up measurements were obtained by trained medical assistants and supervised by a trained registered nurse.

Demographics

Demographics included child’s date of birth, school grade, race, and household membership.

Physical measurements

BMI

Height was measured from a standard stadiometer (Gentech), and weight was measured using a digital scale with participants wearing light clothes and no shoes. Height and weight were measured twice; if they were not the same, the measurements were taken an additional time to ensure accuracy. Body mass index was then calculated [BMI = weight (kg)/height (m²)] and converted into percentiles representing BMI-for-age and gender using CDC growth chart norms. BMI z-scores were also used to assess weight change. Observers were trained using a standardized protocol. Girth was measured in inches at the level of the umbilicus at end-expiration with a Moore Medical Physician’s Tape Measure over light clothing.

Healthy lifestyle evaluation

Participants completed a healthy lifestyle evaluation pre-and post-intervention. The Healthy Lifestyle Evaluation is a validated 48-item questionnaire assessing dietary habits and physical activity levels. Physical activity questions included number of times exercised per week (1 = 0 times, 2 = 1 time, 3 = ≥2 times, and 4 =≥3 or more times) and the consistency of an exercise schedule (1 = Never, 2 = Rarely, 3
The mean age of the participants was 10.8 years. The majority of the participants were female (78%) and minority (83% African American). Fifty percent of the children came from a two parent household, 44% from a one-parent household, and 6% lived with extended family.

The attendance rate for the intervention was 81%, meaning that on average participants attended 10 out of the 12 available classes.

**Anthropometric changes**

Children’s average pre-BMI percentile was the 98.7th (0.8 SD) percentile. The BMI for the parent/primary caregiver indicated that 5.88% were considered healthy weight, 23.53% overweight and 70.59% obese with mean BMI of 35.2 kg/m² (7.6 SD).

**Children’s data:** The t-test for BMI percentile for children indicated that there were no statistically significant differences between the baseline measurement and the follow-up (t (17) = 1.6; p=0.119) with an effect size of d= 0.386. The t-test for BMI z-scores was suggestive, but not significant for differences between the baseline measurement and the follow-up (t (17) = 1.91; p=0.073) with an effect size of d= 0.444. See Table 2 for complete results. Although these results were not significant, 70% of the children’s BMI percentile either reduced or did not increase over the 12-week intervention. The children showed a significant decrease in the abdominal girth from baseline to follow-up (t (17) = 2.44; p=0.028) with the mean decreasing from 37.47 in. (4.52) to 36.24 in. (3.57). The effect size was moderate to large (d = 0.576).

**Parental data:** Parental BMI was significantly lower between the baseline measurement and the follow-up (t (17) = 3.61; p=0.002) with the mean decreasing from 35.3 kg/m² (7.63) to 34.5 kg/m² (7.4) and the effect size was large (d= 0.876).

**Behavioral change**

Table 2 shows the behavioral changes reported from the children’s pre-intervention and post-intervention. Initially, 38.9% of participants reported exercising three or more times per week; post-intervention, 82.4% of participants reported exercising three or more times per week. There was a significant increase in change from baseline to follow-up (t(17) = -2.49; p =0.044), fruit per day (t(17) = -5.72; p =0.000), and milk consumption (t(17) = -2.40; p =0.028) increased, while fried food (t(17) =3.59; p =0.002), cookies/cakes (t(17) =2.41; p =0.028), and soda consumption (t(17) =-3.77; p =0.004) decreased.

Initially, 22% of participants reported that they rarely read nutrition labels, 50% sometimes read labels, and 28% always read labels. Post-intervention, 29% reported sometimes reading labels, and 71% always read labels. Pre-intervention 11% of participants reported eating fruit three times/day that increased to 61% post intervention.

**Discussion**

Overall, the StrongMe! program showed favorable results as an obesity intervention for children aged 6-18 years. Although there were no statistically significant changes in BMI percentile, 70% of the children’s BMI percentile either reduced or did not increase over the 12-week intervention suggesting that in a short time frame, this culturally tailored, family-centered, faith based intervention produced a moderate effect on child weight. Moreover, there were significant changes in abdominal girth and dietary and physical activity behaviors and knowledge. StrongMe! was designed to meet the challenges of overweight in children; it incorporated several components that had
been tested separately in other studies (i.e., motivational interviewing, family-based, and goal-setting). Because the majority of the parents were overweight, the intervention used these various techniques in combination. The curriculum was saturated with education, exposure to positive role models, and goal-setting. StrongMe! used a similar format as Bright Bodies, taking a non-diet, behavioral approach [10]. This program complied with Academy of Nutrition and Dietetics (Academy) guidelines designed to include a combination of nutrition education, behavioral counseling, parent training and modeling, as well as the promotion of physical activity. StrongMe! emphasized parental involvement, educating the parents that they are the gatekeepers of their child’s nutrition in the hope that their modeling of healthy lifestyles and providing healthier options in the home would lead to sustained behavior change. The Academy recommends a multicomponent, family-based intervention to reduce overweight in 5-12 year old children [11].

Previous studies indicate children with overweight parents will often become overweight; this was the case with the intervention group. Ninety-four percent of the parents participating in the intervention with their child were overweight or obese.

The Bright Bodies program, an intensive family-based program that included exercise, nutrition, and behavior modification, produced essentially no weight gain over the 12-month period, a 4% reduction in body fat, and a decrease in BMI. In the StrongMe! program, there was an average decrease in BMI, BMI percentile, BMI z-score and abdominal girth. Although only the abdominal measurement was statistically significant, the others suggests that with a larger sample size, BMI, BMI percentile and abdominal girth. Although the results from this study concerning BMI and BMI percentile were not statistically significant, the effect sizes were moderate and BMI changes were in the right direction. This combined with significant results from abdominal girth changes and health behavior changes are promising. This supports the literature that a family-oriented, faith-based intervention using motivational interviewing and goal-setting can bring about positive results for African American children who are overweight or obese. The authors feel that providing a program such as this may be useful in other areas of the US and may help decrease the amount of obesity and overweight children, particularly in the African American population. Childhood obesity in multi-faceted and thus requires an approach such as the StrongMe! Program. Further research with a larger population and evaluations of long-term changes, including a follow up at 6 months and one year, is warranted.

**Conclusions and Applications**

Although the results from this study concerning BMI and BMI percentile were not statistically significant, the effect sizes were moderate and BMI changes were in the right direction. This combined with significant results from abdominal girth changes and health behavior changes are promising. This supports the literature that a family-oriented, faith-based intervention using motivational interviewing and goal-setting can bring about positive results for African American children who are overweight or obese. The authors feel that providing a program such as this may be useful in other areas of the US and may help decrease the amount of obesity and overweight children, particularly in the African American population. Childhood obesity in multi-faceted and thus requires an approach such as the StrongMe! Program. Further research with a larger population and evaluations of long-term changes, including a follow up at 6 months and one year, is warranted.

**Acknowledgement**

The authors acknowledge the United Way of the Mid-South, Fogelman Fund for supporting this research.

**References**


5. The Surgeon General’s Call To Action To Prevent and Decrease Overweight and Obesity: Overweight in Children and Adolescents.


