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Parent skills training to enhance weight loss in overweight children: Evaluation of NOURISH

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Abstract

Objective—Although there is general agreement that parents should be involved in pediatric obesity treatment, few studies have investigated the effectiveness of interventions that target parents exclusively. Moreover, the effectiveness of this approach has not been adequately assessed with racially diverse families, particularly African Americans, a group at high risk for elevated Body Mass Index (BMI).

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Methods—NOURISH (Nourishing Our Understanding of Role modeling to Improve Support and Health) is a culturally-sensitive parenting intervention targeting overweight African American children (ages 6–11; $M_{\text{BMI}} = 98.0\%$). Families ($N = 84$; 61% AA, 37% White) were randomly assigned to NOURISH or a control group.

Results—NOURISH families significantly improved on child BMI from pre- to post-testing after adjustment for random effects, baseline BMI, and child race. NOURISH parents were very satisfied with the intervention and would recommend it to other parents; 91% strongly or moderately agreed that NOURISH helped them eat in a healthier manner.

Conclusions—These pilot data suggest NOURISH is acceptable and, with refinement, offers promise for reducing pediatric BMI. Outcomes, lessons learned, and parent feedback will inform a larger randomized controlled trial.

Keywords

pediatric obesity; overweight; African American; parenting; intervention

Introduction

Pediatric obesity (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010) remains a significant public health concern. African American and low-income children are at high risk of obesity (Ogden, Lamb, Carroll, & Flegal, 2010; Rossen & Schoendorf, 2012). Interventions must address barriers to healthy eating and exercise that disproportionately affect these groups.

One approach to enhancing pediatric obesity interventions involves targeting parents exclusively (Janicke et al., 2008). Parent-only interventions are less costly than family approaches (Janicke et al., 2009), and avoid making the overweight child the “identified patient,” a situation which could reduce self-esteem and increased disordered eating (Golan & Crow, 2004). Moreover, parents purchase children’s food, control mealtime routines, and role-model eating and activity behaviors (Adkins, Sherwood, Story, & Davis, 2004; Fisher, Mitchell, Smiciklas-Wright, & Birch, 2002).

Few parent-exclusive interventions have been empirically evaluated, and most studies have been conducted internationally. Golan and colleagues (2004) found that Israeli children of caregivers in a parent-only intervention experienced greater weight reductions than those in standard treatment (Golan & Crow, 2004). In a Swiss study, Munsch et al. (2008) compared a mother-only with a mother and child obesity intervention. No group differences emerged with respect to children’s weight; both groups reduced their BMI. Trials conducted in Australia (Golley, Magarey, Baur, Steinbeck, & Daniels, 2007; Shelton et al., 2007; West, Sanders, Cleghorn, & Davies, 2010) and the Netherlands (Jansen, Mulken, S., & Jansen 2011) yielded similar results. Although these findings support the utility of a parent-only approach to childhood obesity treatment, it is unclear whether they would generalize to racially and socio-economically diverse children in the United States.

Preliminary outcomes of parent-only obesity interventions in the United States are promising. Janicke et al. (2008) found that, compared with a control group, children in a parent-only intervention showed greater BMI decreases. Parent satisfaction and adherence

were also higher in the parent-only condition. A similar study (Boutelle, Cafri, & Crow, 2011) found that parent-only and parent and child conditions yielded similar weight loss and activity outcomes. However, attrition was higher in the parent-only condition.

Thus, results of a relatively small number of studies (Boutelle et al., 2011; Golan & Crow, 2004; Janicke et al., 2008) support the feasibility and effectiveness of a parent-only approach to childhood obesity treatment. Most trials included moderately affluent (Boutelle et al., 2011) and ethnically homogeneous samples (Golan & Crow, 2004; Janicke et al., 2007). Research is needed to determine whether results generalize to low income racially diverse children in the urban United States. Thus, this study evaluated the feasibility, acceptability, and preliminary effectiveness of NOURISH (Nourishing Our Understanding of Role modeling to Improve Support and Health), a culturally-sensitive, parent-only group pediatric obesity intervention.

Methods

Procedure

To qualify for participation, caregivers had to be at least 18 years old and have a child (ages 6–11) with BMI at the 85thile who primarily resided with them. Participants also had to speak English, be able to understand basic instructions, and perform simple exercises. NOURISH and the control group are described in detail elsewhere (Mazzeo et al., 2012). A modification was made to NOURISH implementation after the first two waves of data collection. Parents in these waves reported that, although they enjoyed NOURISH, they felt the number of sessions (which was initially 12) should be reduced. To maximize parents' satisfaction while maintaining intervention integrity, the number of sessions was reduced to six. All topics remained covered by extending the length of each session.

The control group involved one, in-person group session focused on nutrition, exercise, and pediatric obesity. Subsequently, control participants received three mailings of publicly available information on pediatric obesity.

Participants

Data were collected at baseline, post-intervention, and six month follow-up. Families were recruited via flyers distributed in local schools, recreation centers, and pediatric specialists' practices. Eligibility was assessed via a phone screen prior to baseline assessment. Approximately 235 caregivers expressed interest in participating. About one third were ineligible, most commonly because child BMI was below the 85thile. Eligible families were invited to an orientation; at this session, consent and assent were obtained and baseline measures completed.

Eighty-four families completed baseline: 91 children ($M_{age} = 8.6 \pm 1.5$ years) and 90 caregivers ($M_{age} = 39.9 \pm 7.4$ years). Most participants were female (85.6% of caregivers; 67.0% of children). The average BMI^{ile} for children was 98.0 ± 2.7 ; mean caregiver BMI was 34.2 ± 9.3 kg/m².

The majority of families identified as African American (60.7%), followed by White (36.9%), Hispanic/Latino/a (1.2%) and multiracial (1.2%); 41.7% reported an annual income of less than \$35,000. Educational attainment among caregivers varied, the greatest percentage reported a high school diploma or more (79.1%); 47.2% of adults were married, 34.8% were single, 12.4% were divorced, and 5.6% were separated.

Overall, 61.9% ($n = 52$) of enrolled families completed post-testing. Likelihood of post-test completion was not dependent on whether caregivers completed the six- or 12-session group ($\chi^2 = 2.84$; $p < .10$); 32.1% ($n = 27$) of enrolled families completed six month follow-up, but participating in the six-session compared with the 12-session group was not associated with follow-up completion ($\chi^2 = 0.04$; $p < .84$). For families enrolled in the intervention, average session attendance was 52.9%.

Parent Measures

Three Factor Eating Questionnaire (TFEQ)—The restraint and disinhibition subscales of the TFEQ (Stunkard & Messick, 1988; Stunkard & Messick, 1985) assessed eating behaviors.

Child Feeding Questionnaire (CFQ)—Parental approaches to and attitudes about feeding their children were measured with the CFQ (Birch et al., 2001). This measure includes seven subscales: perceived responsibility, perceived parent weight, perceived child weight, concern about child weight, pressure to eat, monitoring, and restriction.

Anthropometric measures—Height was measured to the nearest ¼ inch using a stadiometer and weight was measured to the nearest ¼ lb by trained staff; data were used to calculate BMI.

Block Food Screener—Dietary intake was assessed using the Block Food Screener. This instrument has been validated against the Block 100-item FFQ (Block, Gillespie, Rosenbaum, & Jenson, 2000). Correlations between the shorter and longer Block FFQ are .69 for total fat (grams/day) and .71 for total fruit/vegetable (servings/day; Block et al., 2000).

Child Measures

Anthropometric Measures—Height was measured to the nearest ¼ inch using a stadiometer. Weight was measured to the nearest ¼ lb; data were used to calculate BMI in kg/m^2 , which were plotted on the CDC Growth Charts (Ogden et al., 2002) to obtain BMI %ile for age and gender.

Items on the following measures were read to children by staff:

Pediatric Health-Related Quality of Life (PedsQL4.0)—The PedsQL (Varni, Seid, & Kurtin, 2001; Varni, Seid, & Rode, 1999) assesses how health affects daily life in four areas: physical, emotional, social, and school. A psychosocial health quality of life score can be ascertained by averaging totals of three of these subscales (emotional, social, and school functioning).

Pubertal Status—Children (eight years or older) completed a self-assessment of pubertal status using a pictorial measure (Taylor et al., 2001). This measure was significantly associated with results of physical examinations and is recommended for use in studies where clinical examinations are not feasible (Taylor et al., 2001). For children younger than eight, parents reported pubertal status.

Statistical Analysis

Independent samples *t*-tests examined differences in outcomes between participants who completed six versus 12 sessions. To evaluate the primary outcome of changes in child BMI %ile and the secondary outcomes, analyses of variance were applied using PROC GENMOD. Difference scores were calculated by subtracting post-test values from baseline values. These difference scores were then considered the outcome variables. Six month follow-up data were not analyzed because of high attrition; only 32.1% ($n = 27$; 16 control, 11 intervention participants) provided data at this assessment point, thus yielding insufficient power. Therefore, only pre and post scores were examined. For all analyses, child's race, child's sex, and pubertal status were entered as covariates. For families with two parents participating, only mothers' scores were used in analyses as each family only had one set of CFQ scores. The oldest child's data were used when multiple children within a family were enrolled. Analyses of differences from baseline to post-test were conducted on a sample derived using intent-to-treat methodology and also on a sample comprised of only those who completed post-testing.

Results

Primary Outcomes

Child BMI%ile—At baseline, the mean (std) BMI%ile for the NOURISH group was 98.47 (2.24); for the control group it was 97.86 (2.67). At post-test, the NOURISH group showed a decrease in mean BMI%ile [mean (std) = 98.19 (2.73)]. For the control group, there was virtually no change in BMI%ile at post-test [mean (std) = 97.86 (2.61)]. The between-group change from baseline to post-test was significant ($\chi^2 = 7.14$; p -value < .008). Results remained significant in an analysis including only individuals who completed post-testing ($\chi^2 = 8.67$; p -value < .004).

Secondary outcomes—Between group differences from baseline to post-test were observed for parental fat intake ($\chi^2 = 5.16$; p -value = .024). In the intent-to-treat sample, fat intake in the NOURISH group declined from 147.19 (19.15)g to 140.39 (19.38)g. In the control group, fat intake decreased only slightly from 142.20 (20.95)g at baseline to 141.41 (23.34)g at post-testing. This difference in changes remained significant in analyses including only those who completed post-testing. Additionally, there was a between group difference on CFQ concern about child weight ($\chi^2 = 4.20$; p -value = .041). Parental concern about child weight decreased from 4.74 (0.48) to 4.58 (0.65) in the NOURISH group compared to virtually no change in the control group [4.69 (0.47) to 4.66 (0.46)]. This difference did not persist in analyses including only those who completed post-testing. No group differences were observed for the other variables from baseline to post-test.

Feasibility and acceptability—In addition to completing the measures described above, caregivers in NOURISH completed an exit interview at post-testing (Table 1). Participants were very satisfied with NOURISH; 79% strongly agreed with the statement “I enjoyed attending each NOURISH session.” The remainder moderately agreed; 91.7% strongly agreed that they would recommend this group other parents; 91% strongly or moderately agreed that NOURISH helped them eat in a healthier manner and 77.5% said they were exercising more. An independent samples *t*-test revealed only one difference in satisfaction between those who completed six sessions compared with those who completed 12 sessions. Those who completed the 12 session intervention were more likely to endorse the item, “There were too many sessions” ($p < .05$), providing support for the decision to reduce the session number. Table 2 outlines “Lessons Learned” that we will apply in future iterations of NOURISH.

Discussion

NOURISH is a culturally-sensitive intervention targeting parents of overweight and obese young children, and emphasizes role modeling of healthy eating and exercise. Programs like NOURISH are needed, as most previous research has not included samples with large numbers of African American and low-income families (Golan & Crow, 2004; Janicke et al., 2009), not targeted parents exclusively (Epstein, Valoski, Wing, & McCurley, 1994), and not explicitly incorporated material sensitive to African American cultural values (Walker-Sterling, 2005).

Results suggest NOURISH offers promise, although this study identified several ways in which it can be strengthened. NOURISH participation resulted in significant reductions in child BMI. Although the average child BMI reduction for NOURISH participants was small, six weeks is a relatively short period of time to expect more substantial changes. NOURISH participation also resulted in significantly reduced parental fat intake, another important finding, as higher fat intake is linked to disease risk (Oh, Yoon, & Shin, 2005). Maintenance of these changes is unknown because of poor six-month follow-up attendance.

NOURISH participation did not lead to significant changes in children’s quality of life, or parental fruit, vegetable, or fiber intake. These results are consistent with the parent-only pediatric obesity intervention conducted by Jansen et al. (2011), who only reported reductions in BMI. These findings might be attributable, in part, to attrition. Participants’ feedback included strategies to enhance the program and reduce attrition, which might yield stronger outcomes.

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Highlights

- Child BMI improved from pre- to post-testing in the parent-only intervention arm (NOURISH)
- NOURISH participants decreased fat intake and concern about child's weight
- The pilot of NOURISH was feasible and acceptable

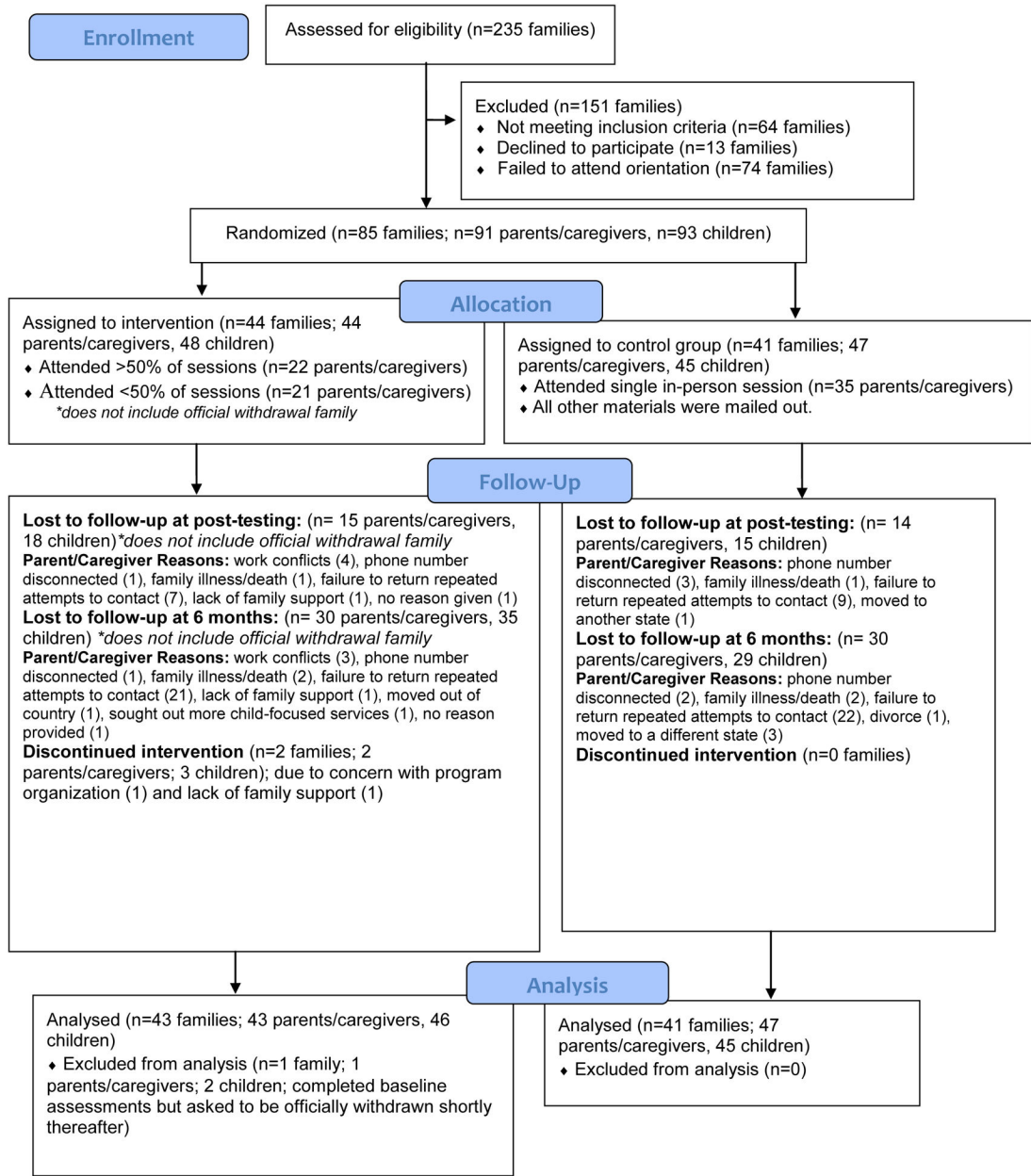


Figure A.
Participant Flow through the Study

Table 1

Sampling of Parents' Feedback on the Exit Questionnaire

Positive Feedback	Negative Feedback/Areas to Improve
"I feel more confident. I think that I have tried to change my parenting style from authoritarian to authoritative. I have also enjoyed spending more time with my daughter doing activities like walking, dancing etc."	"I was excited at first but once it started, it was sometimes difficult to get there, park, and stay focused for 90 minutes after working all day."
"I really enjoyed them and hearing what other parents concerns were like mine." "Great! This was an amazing group and I learned so much important info."	"I enjoyed the group sessions, but became frustrated when people stopped attending." [From a woman whose particular group had an unusually high attrition rate]
"I like the wide range of topics, and the information that was provided." "Very informative as well as life changing."	"The time period was okay, but too many sessions." [This and similar comments were made by a number of people in the 12 session intervention.]
"Everything was great; it seemed a lot of the topics were things I needed to hear." "The aspect that was most helpful was the open discussions." "It's made me realize just how much I am responsible for being a role model for my daughter."	"It would've been great to have a meal cooking session. Or tasting session to open people up to new foods and flavors." [This person and several others asked for more specific meal planning and preparation tips.]
"It has made me more open to allowing my child's input. I talk with him more, and our eating habits, stressing nutrition as opposed to weight loss."	"Have the nutritionist more often."

Table 2

Lessons Learned

Lesson	How this Issue Will be Addressed in NOURISH+
The original location on VCU's campus has very limited parking options, and is not a location with which many area families are familiar and comfortable.	We will implement all program activities at a more convenient facility with a nearby parking deck for which the program will pay. This building is located in a more prominent part of campus with easily recognized landmarks nearby.
12 weekly sessions is too long	Reduce the intervention to 6 weekly sessions. (This was already done in the later phases of the R03 and did enhance retention).
Parents want more hands-on experiences, especially regarding meal planning and preparation.	<ul style="list-style-type: none"> • We have added a 2 hour cooking class to the intervention. • We have also added a grocery store tour, led by a Registered Dietician.
Parents want more time with the dietician.	We added a 60 minute individual session for each family with a Registered Dietician.
More incentives enhance retention.	<ul style="list-style-type: none"> • We have increased the compensation at each assessment point.
Many families are not regularly exposed to novel (to them) healthy foods and are hesitant to spend any of their limited food budgets on foods they or their children might not like.	<ul style="list-style-type: none"> • Provide low-cost, healthy snacks at each intervention session. • Have participants contribute to a group "cookbook" which will include budget-friendly, healthy adaptations of some of their families' favorite traditional recipes. This cookbook will be distributed to all intervention participants at the end of the group sessions.
Participants can lose interest/get too busy if they have to wait a long time for the next group to start. We need more staff so we can offer the group on more evenings and on weekends.	We have budgeted for additional staff salaries. This will enable us to have more than 1 intervention group running at the same time and decrease the time participants have to wait to begin in the study.
Recruitment is most successful in January and September	We have worked to make these prime recruiting periods in our timeline (see Figure 7).
Do not assign too much homework.	We will reduce the amount of homework to 1 major goal per session.
Enhance the goal-setting component of the intervention to improve motivation.	Work more intensively with parents on a smaller number of goals across sessions.
If pedometers are not checked weekly during group, participants will forget about them.	Make weekly pedometer "check-ins" a regular part of sessions and include the tracking of progress on a graph each week.
Booster sessions are not well-attended	We will conduct booster consultations by phone and follow-up with personalized, targeted mailings.