Strategies for Effective Eating Development—SEEDS: Design of an Obesity Prevention Program to Promote Healthy Food Preferences and Eating Self-Regulation in Children From Low-Income Families

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ABSTRACT

Objective: To develop a scientifically based childhood obesity prevention program supporting child eating self-regulation and taste preferences. This article describes the research methods for the *Strategies for Effective Eating Development* program. A logic model is provided that depicts a visual presentation of the activities that will be used to guide the development of the prevention program.

Design: Randomized, controlled prevention program, pretest, posttest, 6 months, and 12 months.

Setting: Two sites: Houston, TX and Pasco, WA. Each trial will last 7 weeks with 8–10 mother–child dyads in each arm (prevention and control).

Participants: Recruitment at *Head Start* districts (Texas; n = 160) and Inspire Child Development Center including *Early Childhood Education* and *Head Start* (Washington; n = 160). Sixteen trials with 16–20 parent–child dyads per trial will provide adequate power to detect moderate effects.

Intervention: Multicomponent family-based prevention program incorporating a dialogue approach to adult learning and self-determination theory.

Main Outcome Measures: Child assessments will include observed taste preferences, caloric compensation, and eating in the absence of hunger. Parent assessments will include parent-reported feeding, feeding emotions, acculturation, child eating behaviors, child food preferences, and child dietary intake. Heights and weights will be measured for parent and child.

Analysis: A multilevel growth modeling analysis will be employed to consider the nested nature of the data: time points (level 1) within families (level 2) within trials (level 3).

Key Words: childhood obesity, prevention program, family-based, child eating self-regulation, food preferences (*J Nutr Educ Behav*. 2016;48:405-418.)

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INTRODUCTION

Childhood overweight and obesity have increased significantly in the past 3 decades.[1] Rates of overweight in the US have more than doubled in younger children; more than 26% of preschool-aged children are currently overweight or obese.[2] Obese children are at an increased risk for poor socioemotional development and problematic medical conditions.[3] During the first 5 years of life, an increase in weight velocity from 2 to 5 years is the strongest predictor of obesity in early adulthood.[4] Childhood obesity rates are particularly high in low-income, minority populations.[2] Targeting young

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children and their families from high-risk groups may help to curb the obesity epidemic.

Programs developed to prevent childhood obesity in school-aged children have had moderate success and limited long-term impact.[5-7] This may be due to the age of the child because the first 5 years are important in the development of child eating behaviors[8] or owing to the lack of inclusion of parents and other family members. The current study will develop and evaluate a novel approach to obesity prevention that will incorporate the family and focus on the self-regulation of eating in young children. The primary goal of the study will be to encourage and assist parents in recognizing and supporting their children to pay attention to their internal cues of fullness and satiety.

Experimental studies with preschoolers can inform childhood obesity prevention efforts at an early age. Studies have shown that preschoolers possess the ability to regulate energy intake during meals[9,10] and across successive meals over 24 hours[11] by starting and stopping eating in response to internal cues of hunger and fullness. Although intake at meals was considerably variable, total daily energy intake was tightly regulated.[11,12] Older children showed poorer compensation compared with younger children; thus, children may lose this ability as they grow older.[13,14] Individual differences in this ability have been linked to feeding behaviors. For example, mothers who reported higher control in feeding had children who showed a lessened ability to self-regulate their eating.[15] Feeding practices such as encouraging eating when the child was not hungry, providing inadequate exposure to novel foods, and serving excessive portion sizes may have deterred children from attending to internal fullness cues. Individual differences in child eating self-regulation have also been linked to child weight.[15-17] Eating in absence of hunger was associated with higher child and adolescent weight,[18-21] and poor satiety responsiveness was associated with greater weight status among children aged 3–11 years.[22-24] Children with poorer eating self-regulation are at greater risk for childhood obesity.

Experimental studies have shown how children come to prefer novel foods. When exposing young children to novel foods, an effect of the exposure amount on choice and liking was shown.[25,26] It took 8 to ≥ 15 exposures for children to learn to prefer novel foods,[25] with results being replicated in a social marketing study[27] and more naturalistic settings.[28] Exposing children to novel foods may increase willingness to consume foods such as vegetables; however, most parents stop serving new foods to children considerably short of the 8–15 recommended exposures.[27,29]

Experimental studies on portion sizes have implications for childhood obesity. Children seen in varying conditions of entrée portion size and energy content ate 34% more calories at a single meal when served a larger, more energy-dense portion.[30] When serving children 3 main entrees and a snack over a 24-hour period, total energy intake was 140 kcal (12%) greater in the large portion condition (double the reference size) relative to the reference condition.[31] In an observational study in a naturalistic setting, the average kilocalories of food mothers served their preschool children for dinner (median, 565 kcal) was greater than the average kilocalories of food mothers themselves consumed during the same meal (median, 547 kcal).[32] The amount served to the child was significantly associated with the amount consumed (r = .88). Large portions typically served to young children may contribute to childhood obesity.

Routines and structure have been associated with better child outcomes; thus home eating routines may be important in creating family structure that supports healthful child eating.[33,34] Preschool children experiencing 3 common household routines which included family dinners had a 40% lower prevalence of obesity.[35] Unconscious drivers of food choice and intake were also prevalent in the larger environment (food advertising, billboards, and food arrangement in the grocery store), which may encourage food choices without reasoned awareness of the long-term impact on childhood obesity.[36]

Numerous programs have been developed, mostly in the school setting, to prevent obesity in children, some of which have had moderate success.[6,7] However, they may be of limited effectiveness for the following reasons: (1) Interventions during the school years do not address child eating patterns developed early in life; (2) interventions that do not involve parents or families limit the sustainability of behavior change; and (3) interventions that focus only on nutrition education and physical activity neglect important parental feeding behaviors that can reduce the likelihood of childhood obesity (eg, encouraging preferences for healthful foods, facilitating self-regulation of energy intake, serving appropriate child-sized portions, establishing mealtime routines, and addressing food cues in the larger environment). Although researchers have begun to develop, evaluate, and disseminate family-based obesity prevention programs,[5,37,38] few comprehensive obesity prevention programs exist that focus on the role parents have in developing children's food preferences, food selection, and self-regulation of energy intake. In addition, even fewer programs exist for preschoolers designed specifically to address the needs of low-income, minority families.[8]

The *Strategies for Effective Eating Development* (SEEDS) prevention program will add to the field by focusing on the role parents have in the development of child food preferences, food selection, and self-regulation of energy intake—known risk factors for childhood obesity in low-income families with preschoolers. To the authors' knowledge, currently no prevention program to date addresses these issues in low-income families. SEEDS will incorporate a dialogue approach to adult learning[39] and a well-known theoretical approach for behavior change: self-determination theory.[40] The child curriculum will focus specifically on developing food preferences and encouraging self-regulation of energy intake. These same issues will be targeted in the parent curriculum along with other parenting behaviors associated with child weight status (serving appropriate child-sized portions, establishing mealtime routines, and addressing food cues in the environment). Fostering behavior change by delivering similar content to parents and children is expected to increase program impact.

Although SEEDS will be developed for use with all low-income families, the first efficacy study will target low-income Hispanic individuals because: