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Abstract

The main purpose of the study described in this article was to test the effectiveness of Little Books and Little Cooks, a 7-week integrated nutrition and parenting education intervention designed to improve eating habits of families, strengthen relationships between parents and their children, and improve preschoolers' cooking skills. Participant families showed promising change related to enhancing children's cooking skills, along with improved parent-child interactions, eating behaviors among children, and feeding practices of parents. These findings suggest that a multidisciplinary, integrated approach addressing both nutrition and parenting is an effective way to help parents guide their children toward healthful eating behaviors.

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Introduction

According to the ecological systems theory (Bronfenbrenner & Morris, 1998), human development occurs as a result of interaction within and among contexts. Many of Bronfenbrenner's early writings recognized the family itself as a more appropriate context for intervention than the individual child (e.g., Bronfenbrenner, 1974). Additionally, group-based parenting education programs have appeared to be effective and potentially cost-effective options for families (London Economics, 2007). It stands to reason that research- and practice-based Extension parenting education programs can make a considerable difference in the lives of families all around a community.

Previous parenting research supports the importance of the parent-child relationship and its impact on healthful development of the child (Bornstein, 2002; Brooks-Gunn & Markman, 2005; Karoly, Kilburn, & Cannon, 2005; Powell, 2005). Nutrition studies in the 1980s began demonstrating that a person's overall parenting style can determine his or her feeding behaviors with a child (Birch, McPhee, Shoba, Steinberg, & Krehbiel, 1987). Contemporary nutrition work continues to demonstrate the potentially positive relationship between parenting styles (including feeding practices and style) or parent-child interaction and young children's eating behaviors, food preferences, dietary patterns, and weight statuses (Rhee, 2008; Ventura & Birch, 2008; Wake, Nicholson, Hardy, & Smith, 2007).

Findings from these studies suggest that parents with competent parenting skills are able to provide a supportive environment for children's healthful eating. However, most nutrition education programs have not addressed parenting skills. According to a focus group study involving parent and family life educators (Ontai, Williams, Lamp, & Smith, 2007), parents lack skills necessary to implement new nutrition practices with their children, but educators do not have the understanding of parenting and child development required to address these issues with parents. Therefore, a multidisciplinary, integrated approach that can speak to both nutrition information and parenting education is needed to help parents foster children's healthful eating behaviors. Extension professionals have been trying this multidisciplinary approach (Thering, 2009), and the U.S. Department of Agriculture's National Institute of Food and Agriculture (2011) has fostered this concept by grouping programs by content expertise and discipline, rather than function.

One way of addressing the challenge of helping parents implement positive nutrition practices with their children is through engaging and fun family practices. Nutrition studies have shown that reading children's books with healthful eating messages encourages children to try new foods and make healthful choices (Drozd, Romaniello, Wearner, Carter, & Auld, 2006; Flood, Murphy, & Hammerschmidt, 2008) and that involving young children in planned cooking experiences is the best way to teach them about good eating habits (Dodge & Colker, 1996). The healthful eating habits children practice early in life affect their health and nutrition throughout youth, including relative to issues with weight gain and obesity (Clark, Goyder, Bissell, Blank, & Peters, 2007), and beyond into adulthood (Campbell & Crawford, 2001; Savage, Fisher, & Birch, 2007). Cooking together is one of a few activities that can help increase children's abilities across all areas of development and help parents learn about healthful eating and their own feeding styles (Spears, 2000).

The Little Books and Little Cooks parenting education program was developed from prior nutrition and parenting education research by an Extension specialist in Nevada, using the family as the primary contextual unit. Based on interaction inherent among family members, it was designed to foster and sustain the child's healthful development by providing engaging, hands-on activities for caregivers and children. The main purpose of the research described here was to evaluate the effectiveness of Little Books and Little Cooks as an integrated nutrition and parenting education program, specifically examining its ability to enhance parent-child interaction skills and parents' feeding practices and to improve children's cooking skills and eating habits.

Methods

Program Description

Little Books and Little Cooks is a 7-week interdisciplinary parenting education program for preschool-age children and their parents that incorporates both nutrition education and parenting education (including parenting-related content specific to nutrition and overall parenting information). During the program, children and parents learn about healthful eating and nutrition information together, apply positive parent-child interaction techniques, and practice school readiness skills through mini lessons, nutrition-related activities, reading children's books about healthful eating/nutrition, and cooking and eating. After the introductory week, each weekly session features a new topic, a new book about healthful eating, and a new recipe (see Table 1).

Table 1.

Little Books and Little Cooks Curriculum Overview

Week	Topic	Book	Recipe
1	Safety rules and equipment-use demonstration		
2	Five food groups according to the U.S. Department of Agriculture MyPlate guide	MyPlate and You	Five-food-group pasta
3	Benefits of cooking with kids	Pumpkin Soup	Pumpkin pancake smiles
4	Introducing cultural foods	Bee-Bim-Bop	Rice ball
5	Parents' feeding styles and child's hunger and fullness cues	Mealtime	Grilled cheese sandwich shapes
6	Child's picky eating behaviors	I Will Never Not Ever Eat a Tomato	Cucumber yogurt dip
7	More fruits and vegetables	Growing Vegetable Soup	Vegetable soup

Program Sites and Participants

Thirty-one program sites in Clark County, Nevada, were selected for participation in the study (conducted January–December 2014) on the basis of staff interest, evidence of community collaboration, population in need, and variations in program characteristics. The selected program sites included community recreation centers, libraries, and parent centers. Program participants were children aged 3–5 and their primary caregivers (referred to herein as parents or caregivers). For the purposes of the study, 349 caregivers completed preprogram questionnaires, and 232 parents completed postprogram questionnaires. The majority of the caregivers who participated (93%) were mothers, and 53% of the participating children were girls. The average caregiver age was approximately 33 years, and the average child age was 4.3 years. More than half of the families (58%) were involved with at least one social service (e.g., Women, Infants, and Children program; Temporary Assistance for Needy Families; Medicaid; Supplemental Nutrition Assistance Program). The parents and children attending the classes were ethnically diverse: 52% were Hispanic, 29% were Caucasian, 8% were Asian, 4% were African American, and 7% were other ethnicities. Fifty-one percent of the parents held a high school degree or less. The program reached diverse audiences in Clark County who are in need.

Outcome Evaluation and Data Analysis

The effectiveness of Little Books and Little Cooks was evaluated through the use of a self-report survey instrument completed by parents and an observation checklist completed by trained observers. The survey

consisted of 27 questions related to parents' feeding styles (Wardle, Sanderson, Guthrie, Rapoport, & Plomin, 2002) and 24 questions related to children's eating behaviors (Wardle, Guthrie, Sanderson, & Rapoport, 2001), all having Likert-scale response options ranging from 1 (*never*) to 5 (*always*); seven demographic questions; a question related to frequency of cooking, with scaled response options ranging from 1 (*never*) to 6 (*every day*); and a question related to frequency of fruit and vegetable consumption for parents and children, with scaled response options ranging from 1 (0) to 5 (5+). The observation checklist was created for the program and designed to be completed by trained researchers different from the program providers. The observation checklist addressed child cooking skills (13 items), parent-child interaction during cooking (10 items), and mealtime behavior (four items); scales for all items ranged from 1 (*not observed*) to 3 (*consistently observed*). Rater reliability training was conducted at the investigator meetings and five pilot program sites before the start of the study (.91 reliability). Both assessments—the parent survey and the observation—were administered at the start and end of each 7-week cycle. The preprogram and postprogram mean scores for each subscale and individual item were compared through the use of paired *t*-tests ($N = 228$).

Findings

Parent Outcomes

Parent-Child Interactions

Parent-child interactions were observed during the first and last days of cooking and mealtime. During cooking, there was a significant increase in five positive parent-child interactions and a significant decrease in two negative parent-child interactions (Table 2). Parents engaged in more positive interactions and fewer negative interactions after attending the program.

Table 2.

Parent-Child Interactions During Cooking ($N = 228$)

Observation	At	At	<i>t</i> -test
	program start	program end	
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	
Positive parent-child interaction			
Parents respond to child's needs promptly	2.4 (.7)	2.7 (.5)	6.7***
Parents pay attend to the child	2.3 (.7)	2.6 (.6)	5.8***
Parents model correct behaviors	2.2 (.7)	2.6 (.6)	6.1***
Parents give praise or physical affection	2.1 (.7)	2.6 (.5)	7.3***
Parents cheer and show excitement at the child's performance	2.0 (.8)	2.2 (.7)	3.8***
Negative parent-child interaction			
Parents interfere with child's actions	1.6 (.7)	1.5 (.7)	1.1
Parents issue a command (no choices)	1.5 (.6)	1.5 (.7)	.8

Parents use direct disparaging comments or putdowns of child's performance	1.2 (.5)	1.0 (.1)	4.0***
Parents make fun of the child	1.2 (.5)	1.0 (.2)	2.8**

Note. Scale ranging from 1 (*not observed*) to 3 (*consistently observed*).

** $p < .01$. *** $p < .001$.

Parent-child interactions during mealtime also were observed, and preprogram and postprogram observations were compared. At the end of the program, parents were significantly more likely to allow children to serve themselves ($t = 5.7, p < .001$), and children were significantly more likely to try new foods ($t = 2.9, p < .01$), eat fruits and vegetables if served ($t = 6.3, p < .001$), and respond to their own hunger and fullness cues ($t = 4.6, p < .001$).

Frequencies of Cooking with Child

At the start and end of the program, parents were asked about how often they cooked with their children. Parents were significantly more likely to report that they cooked more often with their children at home after participation in the program ($t = 8.4, p < .001$). On the last day of the program, parents also were asked how often their children help them prepare food; 85% of parents reported that their children helped them prepare food a little or a lot more often after program participation than before program participation.

Parents' Feeding Styles

Of the 27 questions about parents' feeding style, 10 questions were about parental control over feeding, eight were about parents' encouragement when feeding, four were about instrumental feeding, and five were about emotional feeding. Although there was no significant difference before and after the program relative to parents' frequencies of controlling what their children ate, parents were more likely to be encouraging, less likely to use food as a reward, and less likely to use food to make the child feel better after program participation than before program participation (Table 3).

Table 3.
Parent Feeding Styles ($N = 226$)

Aspect of feeding style	At program start <i>M</i> (<i>SD</i>)	At program end <i>M</i> (<i>SD</i>)	<i>t</i> -test
Control over eating	3.69 (.51)	3.63 (.56)	1.83
Prompting/encouragement	4.09 (.554)	4.18 (.58)	2.35*
Instrumental feeding	2.05 (.76)	1.89 (.76)	2.77**
Emotional feeding	1.89 (.79)	1.73 (.78)	3.13**

Note. Scale ranging from 1 (*never*) to 5 (*always*).

* $p < .05$. ** $p < .01$.

Child Outcomes

Children's Cooking Skills

Thirteen children's cooking skills were developed on the basis of Nevada prekindergarten readiness indicators and were evaluated through observation during the first day and last day cooking activities. Children demonstrated significant improvement in all cooking skills from the beginning of the program to the end of the program (Table 4).

Table 4.
Children's Cooking Skills ($N = 226$)

Skill	At	At	t-test
	program start	program end	
	<i>M (SD)</i>	<i>M (SD)</i>	
Wash hands for 20 sec before cooking and eating, and when necessary	1.70 (.66)	2.45 (.55)	10.98***
Measure ingredients (using measuring spoons or cups)	1.76 (.57)	2.45 (.58)	12.05***
Rinse and scrub fresh produce (using scrubber or hands)	1.89 (.75)	2.51 (.61)	7.37***
Peel fresh produce	1.61 (.61)	2.18 (.62)	9.82***
Cut hard or soft foods with a plastic or dull knife	1.58 (.57)	2.09 (.57)	9.18***
Grate cheese or vegetables	1.64 (.59)	2.03 (.66)	6.57***
Stir ingredients together	2.24 (.75)	2.79 (.45)	9.06***
Arrange foods on a plate	1.59 (.65)	2.02 (.68)	6.89***
Follow steps in the recipe	1.89 (.69)	2.51 (.79)	10.88***
Wipe up/clean up after cooking	1.80 (.71)	2.46 (.70)	10.90***
Wash dishes after cooking	1.19 (.60)	1.77 (.88)	4.49***
Set the table/serve foods	1.66 (.75)	2.13 (.71)	7.30***
Clear the table after a meal	1.97 (.80)	2.54 (.70)	8.13***
Overall cooking skills	1.74 (.45)	2.32 (.40)	18.24***

Note. Scale ranging from 1 (*not observed*) to 3 (*consistently observed*).

*** $p < .001$.

Children's Eating Styles

Of the 24 questions about children's eating style, four questions were about children's enjoyment of food, six were about children's picky eating, five were about food responsiveness, four were about slow eating, and

five were about satiety responsiveness. After the program, parents were more likely to report that their children were less picky about eating and ate less when not hungry (Table 5).

Table 5.
Children's Eating Behaviors ($N = 226$)

Behavior	At program start <i>M</i> (<i>SD</i>)	At program end <i>M</i> (<i>SD</i>)	<i>t</i>-test
Enjoyment of food	3.58 (.78)	3.78 (.73)	4.47 ***
Food responsiveness	2.35 (.72)	2.41 (.74)	1.13
Satiety responsiveness	2.93 (.60)	2.82 (.60)	3.02**
Slowness in eating	3.02 (.70)	2.97 (.77)	1.19
Food fussiness	2.98 (.76)	2.83 (.72)	3.46**

Note. Scale ranging from 1 (*never*) to 5 (*always*).

** $p < .01$. *** $p < .001$.

Fruit and Vegetable Consumption

Children's and parents' fruit and vegetable consumption was assessed via the pre- and postprogram questionnaires (e.g., "How many servings of fruits and vegetables do your child and you eat per day?"). Parents were significantly more likely to report that their children consumed more fruits and vegetables after completing the program than before ($t = 4.5, p < .001$). In addition, parents were significantly more likely to report that they themselves consumed more fruits and vegetables after completing the program than before ($t = 3.8, p < .001$).

Conclusions and Recommendations/Future Directions

Little Books and Little Cooks involves an interdisciplinary curriculum used to deliver both parenting and nutrition information over a 7-week period. The program uses hands-on, practical activities for children and parents that were shown to result in positive changes in children's healthful eating behaviors and cooking skills, parents' interactions with children and feeding practices, and family eating environments. After completing the program, many participants reported the highest level of satisfaction with the program and conveyed willingness to continue using what they had learned. Parents also reported on their children's willingness and confidence related to cooking and trying new foods. However, a major limitation of the study reported here is that it did not assess whether behavior changes continued after program completion. It is hard to know whether parents and children continued using what they learned.

The recommendations and future directions that follow are based on the findings of the study described here.

- Hands-on programs for parents and children that combine nutrition information and parenting education are needed to help parents and children learn together about healthful eating. Children learn better when

parents take an active interest and seem involved, and parents learn better when they practice rather than just talk about a concept. To benefit children and parents alike, Extension professionals should be trained to understand both nutrition information and parenting information.

- Program developers should focus on creating a variety of additional theme-based interdisciplinary, integrated programs that can be shared with Extension professionals in varying disciplines (e.g., nutrition and parenting, horticulture and nutrition, horticulture and child development). By planning and facilitating interdisciplinary programs, Extension professionals can better respond to critical regional issues with limited resources and embrace the needs of diverse communities.
- The program evaluation discussed here was conducted at the start and end of a program cycle. Future work must confirm whether the results discovered through the evaluation translate to lasting changes in eating behaviors and parent-child interactions.
- Future research should involve the study of long-term effects on adults and children of a variety of nutrition programs (i.e., programs addressing obesity, positive feeding, healthful eating habits, picky eating, etc.). There are many nutrition education programs developed and run by the Cooperative Extension System, and it would be worthwhile to study lasting effects of those programs.

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