



Food-related behavior and intake of adult main meal preparers of 9–10 year-old children participating in iCook 4-H: A five-state childhood obesity prevention pilot study



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ABSTRACT

It is important to understand adult outcomes in childhood obesity prevention programs as parents and caregivers have a significant influence on the eating and physical activity habits of youth. Grounded in the social cognitive theory, the iCook 4-H study was centered on a dyad model (9–10 year-olds and their primary meal preparers) to teach healthy cooking skills, shopping and meal habits, and being active as a family. The program took place in five states and dyads ($n = 54$) were recruited through flyers, e-mails, and in-person contact. The focus of this article is to provide findings from adult program participants. Demographics and self-reported food intake, procurement, preparation and safety practices, feeding relationships, mealtime routines, and height and weight were collected through surveys at baseline and program completion, which spanned 3 months. Descriptive statistics including two-related samples tests and paired samples t tests were used to assess pre- and post-program survey data responses at $p < 0.05$ significance level. Most had a bachelor's degree (31%) or some college (29%), about half were white, 66% were married, about 30% of households participated in assistance programs, and 82% were female. At program conclusion, participants significantly improved meal planning, prioritizing healthy meal choices, shopping with a grocery list, and reading Nutrition Facts Labels. There were also significant, positive differences noted in cooking skill confidence ($p = 0.015$), desire to cook more meals at home, and fewer fast food meals. Adult-youth feeding interactions also significantly improved. There were also significant increases in fruit juice (100%), vegetable soup, and whole grain consumption. Based on results, adults reported improvements in meal planning, cooking, and purchasing skills that were taught in classes.

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1. Introduction

It is important to understand adult outcomes in childhood obesity prevention programs as parents and caregivers have a significant influence on the eating and physical activity habits of youth. Because families are such a prominent part of social environments, they may play an important role in combatting the emerging obesity epidemic as lifestyle habits developed as a young

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child carry over into adulthood (Li & Wang, 2008; President's Council on Sports, Fitness, and Nutrition, 2013; Pahkala et al., 2010). Adults take the health practices learned as children to influence their own children, as well as generations to come. Parents directly and indirectly influence a child's eating habits (Wheat & Axford, 2009). An example of a direct influence would include the kinds and amounts of food in the house, as well as how the food is prepared. Indirect influences include the mealtime routines and whether or not food is used as a reward or punishment (Wheat & Axford, 2009).

Food preparation skills are an essential component of healthful living because they are needed to produce palatable food that meets dietary recommendations. Many people of all ages are not meeting dietary recommendations because of deficiencies in knowledge and skills related to nutrition and food preparation, with fruits and vegetables especially problematic (Condrasky, Corr, & Cason, 2007). Inadequacy in food preparation skills compounded by busy schedules may hinder dietary quality, because families may be more likely to purchase low nutrient-dense fast food, ready-prepared meals, and processed snack foods (Boutelle, Fulkerson, Neumark-Sztainer, Story, & French, 2007). Hammons and Fiese (2011) found that child and adolescent nutritional health is significantly associated with frequency of shared family meals, with those engaging in family meals three or more times a week more likely to be in a normal weight range and have healthier dietary and eating patterns compared to those with less family meal engagement. Dining together as a family not only can improve nutritional quality of meals, but shows family members that time together is valued and members are able to discover important aspects of each other's lives (Fritz, 2006). Hands-on cooking activities that focus on quick, easy meal preparation for both youth and adults may be more successful in improving eating habits, because this type of learning allows participants to incorporate knowledge and create a tangible accomplishment of the food item prepared.

Parent feeding styles may also be related to child nutrition outcomes and weight status. For example, parents who exhibit a high level of control or restriction in their child feeding practices may contribute to higher child weight by promoting overeating (Birch & Fisher, 1998; Johnson & Birch, 1994; Ventura & Birch, 2008). On the other hand, permissive child feeding practices, where parents show lack of boundaries and regulation in food choices, tend to also raise children with disproportionately higher body mass indexes (BMIs), mostly because of lack of feeding boundaries (Hughes, Power, Fisher, Mueller, & Nicklas, 2005). Authoritative or democratic feeding is the parental feeding style that appears to rear the most nutritionally adjusted children. This feeding style is characterized by parents setting appropriate boundaries, while still including the child in food-related decisions, and being able to effectively manage food-related conflicts (Kitzman-Ulrich et al., 2010; Kremers, Brug, de Vries, & Engles, 2003; Van der Horst et al., 2007). Health behavior change programs that include parents/caregivers should educate them about authoritative feeding practices (Kitzman-Ulrich et al. 2010) since it is the recommended parental feeding style.

Researchers reviewing childhood obesity intervention programs found that when parents were directly engaged in the intervention process, the outcomes were more favorable compared to studies where parents were not directly involved, such as with child-only or parent-only interventions (Hingle, O'Connor, Dave, & Baranowski, 2010; Kelishadi & Azizi-Soleiman, 2014). Parents and caregivers have the responsibility of modeling and reinforcing eating and physical activity behaviors, regulating the amounts and types of food available in the home, and reinforcing behaviors and creating and enforcing rules about how time and resources will be used (Ball, Ambler, Keaschuk, Rosychuk, Holt, Spence, et al. 2012;

Hunter, Steele, & Steele, 2008; Lindsay, Sussner, Kim, & Gortmaker, 2006). Understanding the impact on adults participating in childhood obesity interventions is important because children model adult eating and physical activity habits, and adults act as the child's nutritional gatekeepers. With this in mind, adult meal-provider participation and instruction should be a vital component of a childhood obesity intervention (Gerards & Kremers, 2015). Currently, however, there is little research on behavior change interventions involving both parents and children (dyads) attending the sessions together, especially regarding the adult program outcomes.

In the iCook 4-H program, which was grounded in the 4-H experiential learning model (Pfeiffer & Jones, 1983) and social cognitive theory (SCT) (Bandura, 1977), adults and youth from rural, diverse, and/or low-income populations attended educational sessions in a variety of community settings. Each session was designed for family-centered activities around developing basic culinary skills, promoting family mealtime, and tips to stay active as a family. The 4-H experiential learning model hypothesizes that living a healthful lifestyle is best achieved with the help of a support system. In 4-H, adults act as leaders, role models, and participants in community outreach efforts with youth, thereby creating an extensive support system. In turn, through reciprocal role modeling in the family-centered education sessions, adults as well as youth may improve culinary competence, food purchasing and mealtime behaviors, and physical activity levels. Consistent with 4-H programming, iCook's educational method was a "learn by doing" approach, incorporating both observational and hands-on learning and fitting well into the constructs of the SCT. The SCT evolved from Bandura's Social Learning Theory (1977), an educational and psychological theory that emphasizes modeling and reinforcement of desired behaviors from those who have a significant influence, such as family members (Hopper et al., 1996). The constructs of the SCT indicate that environment is a large determinant of behavior, rather than solely personal characteristics. The theory focuses on how both personal characteristics and environmental influences combine to yield behavioral outcomes (DiClemente, Salazar, & Crosby, 2013).

This study was a 3-month pilot test for a childhood obesity prevention intervention study. The goal was to explore changes in adults attending family-centered nutrition education sessions with youth, in self-reported food procurement, preparation, intake and safety practices, feeding relationships, family mealtime routines, exercise practices, and BMI.

2. Methods

The iCook 4-H program was conducted by researchers and Extension partners in Maine, Nebraska, South Dakota, Tennessee, and West Virginia. The curriculum, modified from the Nebraska-based *Fast Foods* and *Youth in Motion* Extension curricula, was created by Extension staff and researchers as part of the iCook 4-H project. Modifications included a focus on MyPlate and increases on food safety and utilizing technology. Each class was designed following an instructional format for consistency. Components included lesson focus, session logistics, long-range goal(s), lesson-specific objectives, introductory activity, instructions/procedures, closure, and materials/handouts. Timing varied slightly depending on the type of recipe being prepared, but on average sessions followed this format: welcome and introduction (10 min); introductory activity (10 min); recipe preparation and culinary skill development (45 min); physical activity break (15 min); family communication (15 min); goal setting (15 min); take-home message and wrap-up (10 min). The following principles were present in all lessons: MyPlate, culinary skill development through recipe

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