

Development and Evaluation of a Family-Based Cooking and Nutrition Education Program

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Abstract

Low-income families experience many barriers to purchasing and preparing healthful foods. To help address some of these barriers, a team created a family-based cooking class, Healthy All Together, in which participants learn strategies for how to stretch their food dollars and feed their families healthful meals. In this article, we describe the development of Healthy All Together, report program impacts, and summarize program feedback from participants and instructors. Of particular importance is the idea that engaging children in cooking through a family-based class has the potential to help families consider how to use strategies to mitigate barriers to healthful cooking.

Keywords: [cooking class](#), [low-income families](#), [nutrition education](#), [food access](#)

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Introduction

Low-income families experience barriers to purchasing and preparing healthful foods, including those related to transportation (Bowen, Elliott, & Brenton, 2014), cost (Mulik & Haynes-Maslow, 2017), convenience (Haynes-Maslow, Auvergne, Mark, Ammerman, & Weiner 2015), time (Haynes-Maslow, Parsons, Wheeler, & Leone, 2013), nutrition education (Variyam, Blaylock, & Smallwood, 1996), and food preparation skills (Boyington, Schoster, Remmes Martin, Shreffler, & Callahan, 2009; Reicks, Randall, & Haynes, 1994; Yeh et al., 2008). Diet is influenced by income but also by education, social resources, and food costs (Darmon & Drewnowski, 2008; Drewnowski & Specter, 2004; Eagle et al., 2012).

Low-income parents/caregivers purchase foods their children like—often nutrient-deficient foods—to reduce

food waste (Bowen et al., 2014; Daniel, 2016). Parents/caregivers often avoid involving children in meal preparation due to the perception that children's involvement increases meal preparation time (Condrasky, Johnson, Corr, & Sharp, 2015; Fulkerson et al., 2011). However, children must try new foods eight to 15 times before they acquire food preferences for them (Sullivan & Birch, 1990), and children enrolled in cooking classes are more likely to try new foods (Condrasky et al., 2015; Woodruff & Kirby, 2013). Most cooking programs focus on either children or adults, and few target families (Miller, Kaesberg, Thompson, & Wyand, 2017). Bringing adults and children together as a family unit allows them to practice cooking with an instructor before cooking at home (Robson, Stough, & Stark, 2016).

Healthy All Together (HAT) is a program designed to mitigate barriers to healthful cooking through family-based cooking and nutrition education. HAT was developed by North Carolina State University Expanded Food and Nutrition Education Program (EFNEP) and Supplemental Nutrition Assistance Program-Education (SNAP-Ed) personnel, including members of our author group. HAT was pilot tested in two rural North Carolina counties. The purposes of this article are to (a) describe the development of HAT, (b) report impacts on adult participants in the pilot implementation of HAT, and (c) summarize program feedback from the pilot implementation. Such information may be useful to Extension professionals looking to create future cooking and nutrition education programs.

Theory and Conceptual Model

Social cognitive theory (SCT) offers the concept of reciprocal determinism to describe the interdependent influences among individuals, their behaviors, and the environments in which they live (Bandura, 1986). This theory suggests that effecting behavior change requires addressing how individuals perceive and interact with their environments. In the case of effecting behavior change related to healthful eating, addressing such factors includes focusing on food purchasing habits, attitudes toward foods, and self-efficacy regarding cooking and preparing healthful meals. Additionally, focusing on the parent/caregiver and child as a family unit addresses the dual goals of helping parents/caregivers become more confident in their ability to cook and prepare healthful meals and helping children develop positive attitudes toward eating meals that are more healthful.

Methods

To support low-income families and address barriers to purchasing and preparing healthful foods, our team developed HAT, an in-person family-based cooking and nutrition education program. This innovative 6-week (2 hr/week) program promotes cooking together and provides age-appropriate nutrition education. Parents/caregivers and children are organized in three age-appropriate groups: (a) parents/caregivers and children aged 12 and older, (b) children aged 8–11, and (c) children aged 4–7. Our team of EFNEP and SNAP-Ed staff created developmentally appropriate curricula based on existing materials. The 4- to 7-year-old age group uses lessons from the Color Me Healthy curriculum for SNAP-Ed (Witt & Dunn, 2012). The 8- to 11-year-old age group uses lessons from EFNEP's adolescent program based on the Kids in the Kitchen curriculum from University of Missouri Extension. The adult program is based on North Carolina State University's EFNEP curriculum.

In the pilot implementation, HAT instructors were cotaught by three Extension professionals (EFNEP educator, family and consumer sciences agent, and another Extension professional). North Carolina State

Extension specialists observed at least one lesson at the beginning of the 6-week session and provided feedback to instructors to improve program delivery. Classes were taught at faith-based organization sites. Each class began with a brief introduction before participants convened in age-appropriate groups for lesson content; the last hour focused on cooking a meal together (Table 1). Before the lesson ended, families set weekly behavior change goals.

Table 1.
Weekly Lesson Content for Healthy All Together

Lesson	Children lesson plan (4–7 years)	Adolescent lesson plan (8–11 years)	Adult lesson plan (12 years and above)	Weekly meal
1. <i>Healthy All Together</i> Basics	Color Me Healthy introduction; food of the day—strawberry; clean hands; table setting; Drawing My Garden worksheet—strawberry	MyPlate; food safety; kitchen safety; cooking basics—measuring; table setting	MyPlate; food safety; cooking basics; setting goals	Mini meatloaves; easy fruit salad
2. Choosing More Fruits, Vegetables, and Activity	Trying new foods; physical activity; food of the day—peppers; Drawing My Garden worksheet—peppers	Choosing more fruits and vegetables; physical activity; knife skills	Choosing more fruits and vegetables; physical activity; knife skills	Super stir-fry; colorful fruit kabobs with yogurt orange dip
3. Planning and Shopping	Where milk comes from; food of the day—broccoli and cauliflower; Drawing My Garden worksheet—broccoli	Planning healthful meals; comparing food costs	Planning for dinner and shopping for ingredients; getting the best for less	Tuna burgers; colorful coleslaw
4. Shop for Value, Check the Facts	Eat a rainbow of colors; food of the day—leafy greens; Drawing my Garden worksheet—greens	Food label; making smart drink choices; focus on dairy and whole grains	Shop for value; check the facts; making smart drink choices	Easy lasagna; build your own salad; fruit smoothie
5. Eat Healthier Meals at Home	Feeling heart beat; food of the day—apple; grain foods in a day; Drawing My Garden worksheet—apple	Helping with planning and preparing meals and snacks at home; smart-size your portions	Plan, shop, fix, and eat more meals at home; smart-size your portions	Chicken quesadillas; corn and black bean salsa; apple fruit salad; tooty-fruity pudding cup
6. Healthier All	Where produce grows;	Choosing health for life;	Choosing a healthier you	Baked

Together for Life	food of the day—tomato; snack attack; Drawing My Garden worksheet—tomato	setting long-term goals; review of knowledge	for life; setting long-term goals	chicken with herbs; brown rice with cheese; tomatoes; three fruit salad
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During the first and last sessions of the two pilot implementations of the HAT program, 19 adult participants self-reported demographic information and completed a behavioral survey and a 24-hr food recall. The validated behavioral survey included food safety, food security, and food resource management questions (Blackburn et al., 2006). Food safety questions addressed washing hands, cleaning surfaces after raw meat has been on them, thawing frozen food on the counter/in the sink, and using meat thermometers. Food security questions addressed participants' levels of food security during the preceding month. The response set for both the food safety and food security questions ranged from 1 = *never* to 6 = *always*. Food resource management questions addressed (a) how often participants prepared meals at home (response set: 1 = *I rarely cook at home*, 2 = *1 day/week*, 3 = *2 days/week*, 4 = *3 days/week*, 5 = *4 days/week*, 6 = *5 days/week*, 7 = *6 or 7 days/week*) and (b) how often participants compared food prices to save money, planned meals before going grocery shopping, and made a list before going grocery shopping (response set: 1 = *never* to 6 = *always*). The 24-hr food recall included validated dietary questions about the amounts of grains, vegetables, fruits, dairy, protein, total energy, sodium, saturated fat, fat, and dietary fiber consumed per day (Scott, Reed, Kubena, & McIntosh, 2007). We used paired *t* tests to assess statistical significance. Due to the small sample size, a *p*-value of $<.10$ was considered statistically significant (Fisher, 1950).

We obtained qualitative information from 12 program participants (via two focus groups) and two instructors (via interviews) to elicit feedback we could use to strengthen future iterations of HAT. Focus group participants were recruited by instructors during the last class session. Questions for the focus group sessions and interviews were based on SCT; they focused on addressing how HAT may have affected participants' individual behavior change as we recognized that participants' environments had not changed. For example, participants were asked whether their children talked about their program experiences, whether they had made any of the class recipes at home, and whether they were putting into practice the knowledge gained from the program. Additionally, participants were asked what they liked about the program, what they did not like, and what they would change. During the interviews with instructors, the moderator asked them what they liked about the class, what they found challenging, and what they would change. Prior to starting each focus group/interview, a moderator explained the study purpose and how information would be used to improve the program. All focus group participants and interviewees gave verbal consent, and conversations were digitally recorded and transcribed. We used content analysis to analyze the qualitative data (Guest, MacQueen, & Namey, 2011). The study was approved by North Carolina State University's institutional review board.

Results

Demographics

The average age of parent participants in the two HAT implementations was 41.6 (Table 2). All participants self-identified as Black/African American, and the majority of participants (94.7%) were female (Table 2).

Table 2.
Healthy All Together Participant Demographics

Characteristic	Number of participants	Percentage of participants	<i>M</i>	<i>SD</i>
County				
Halifax	11	57.9		
Northampton	8	42.1		
Age	19		41.6	14.5
Sex				
Female	18	94.7		
Male	1	5.3		
Race				
Black or African American	19	100.0		
Highest level of education				
8th grade or less	1	5.3		
Some high school	6	31.6		
High school or GED	7	36.8		
Some college	3	15.8		
Associate's degree	1	5.3		
College graduate	1	5.3		
Annual household income (\$)				
<\$10,000	8	42.1		
\$10,000–\$19,999	4	22.2		
\$20,000–\$29,999	1	5.3		
\$30,000–\$39,999	2	10.5		
\$40,000–\$49,999	1	5.3		
>\$50,000	2	10.5		
Did not answer	1	5.3		
Number of children living in household			2.1	1.7
Number of adults living in household			1.6	1.0
Total household size			4.6	1.9

Note. $n = 19$.

Behavior and Dietary Recall

Table 3 shows findings from the behavioral surveys. On average, participants practiced food safety behaviors less frequently at the end of the program. However, only the change in frequency of thawing frozen food on the counter/in the sink was significant ($p = .031$). With regard to food security, although there was a decrease in participants' reporting eating less than they wanted to at the end of the program, there was an increase in their reporting not having enough money to pay for food. Food resource management skills varied, and only change related to meal planning was significant ($p = .099$).

Table 3.
Participant Results From Food Behavior Checklist

Item	No. of observations	Entry value (<i>M</i> , <i>SE</i>)	Exit value (<i>M</i> , <i>SE</i>)	Difference (Exit – Entry)	<i>p</i>
Food safety ^a					
Practice hand washing	19	5.74 (0.18)	5.32 (0.25)	–0.42	.202
Clean items/surfaces	19	5.63 (0.26)	5.47 (0.22)	–0.16	.652
Thaw frozen food on the counter or in the sink	19	4.05 (0.42)	2.95 (0.46)	–1.10	.031**
Use meat thermometer	19	2.00 (0.37)	1.79 (0.25)	–0.21	.600
Food security ^b					
Eat less than wanted to	19	2.84 (0.44)	2.42 (0.39)	–0.42	.279
Do not have enough money to pay for food	19	1.44 (0.20)	1.94 (0.30)	0.50	.155
Food resource management					
Cook at home ^c	19	4.44 (0.48)	4.83 (0.48)	0.39	.351
Compare food prices ^d	19	4.39 (0.36)	4.06 (0.38)	–0.33	.344
Plan meals before shopping ^d	19	2.89 (0.44)	3.63 (0.39)	0.74	.099*
Make list before shopping ^d	19	3.58 (0.47)	3.05 (0.32)	–0.53	.235

Note. *SE* = standard error, *p* = significance at .10 level.

^aFood safety measured on Likert scale ranging from 1 (*never*) to 6 (*always*). ^bFood security measured on Likert scale ranging from 1 (*never*) to 6 (*always*). ^cFood resource management item with scale anchors as follows: 1 = *I rarely cook at home*, 2 = *1 day/week*, 3 = *2 days/week*, 4 = *3 days/week*, 5 = *4 days/week*, 6 = *5 days/week*, 7 = *6 or 7 days/week*. ^dFood resource management item measured on Likert scale ranging from 1 (*never*) to 6 (*always*).

* $p \leq .10$. ** $p \leq .05$. *** $p \leq .01$.

According to the results from the dietary recalls (Table 4), participants increased intake of whole grains by

0.79 ounce-equivalent/day ($p = .003$), increased intake of dairy by 0.78 cups/day ($p = .0157$), and decreased intake of saturated fats by 10.62 grams/day ($p = .071$).

Table 4.
Participant Results From 24-Hour Dietary Recalls

Recall item	No. of observations	Entry value (<i>M</i> , <i>SE</i>)	Exit value (<i>M</i> , <i>SE</i>)	Difference (Exit – Entry)	<i>p</i>
Total grains (ounce-equivalents/day)	19	4.27 (0.65)	5.07 (0.61)	0.80	.298
Whole grains (ounce-equivalents/day)	19	0.24 (0.12)	1.03 (0.27)	0.79	.003***
Refined grains (ounce-equivalents/day)	19	4.03 (0.61)	4.04 (0.53)	0.011	.987
Vegetables (cups/day)	19	1.07 (0.25)	1.50 (0.24)	0.43	.268
Fruits (cups/day)	19	0.86 (0.24)	1.25 (0.30)	0.39	.256
Dairy (cups/day)	19	0.34 (0.11)	1.12 (0.31)	0.78	.0157**
Protein (grams/day)	19	9.01 (1.34)	6.89 (0.83)	-2.12	.210
Seafood (ounces/day)	19	1.63 (1.10)	1.03 (0.44)	-0.60	.511
Energy (kilocalories/day)	19	1,690.62 (190.64)	1,829.81 (156.70)	139.19	.488
Sodium (milligrams/day)	19	2,839.28 (338.21)	3,508.15 (330.45)	668.87	.128
Total fat (grams/day)	19	76.14 (11.80)	73.50 (7.10)	-2.64	.845
Saturated fat (grams/day)		32.02 (5.18)	21.39 (3.16)	-10.62	.071*
Total fiber (grams/day)	19	10.91 (1.70)	13.18 (1.73)	2.28	.242

Note. *SE* = standard error, *p* = significance at .10 level.

* $p \leq .10$. ** $p \leq .05$. *** $p \leq .01$.

Participant Focus Groups and Instructor Interviews

Focus Groups

Participants said their favorite aspect of HAT was cooking. They appreciated learning new recipes and having instructors assist them in preparing meals. Half of the participants said the didactic portion of the class was too long. When asked what they learned in the program, all participants accurately described the curriculum's content. Although most participants remembered concepts from class, they said that adopting these behaviors was difficult given their hectic and unpredictable schedules.

All participants said their children had positive experiences with the class. They stated that their children looked forward to class and asked whether they could help with meals at home. However, the majority of parents/caregivers chose not to have their children cook at home because they still felt it would be too

onerous and time consuming to ensure their children's safety while doing so (even though HAT addressed how to let children help safely in the kitchen). Overall, parents said their children wanted to practice what they had learned in HAT.

Instructor Interviews

Both instructors thought that HAT lessons were too long, adult lessons consisted of too much information, and it was difficult for participants to grasp all the concepts. Other logistical issues included lack of effective training for delivering the class, including training on transitioning from the didactic portion of the class to cooking, making substitutions for meal ingredients, and working with children with behavioral issues. Both instructors did enjoy cooking with program participants and watching the families eat together. Lastly, there were issues with recipes taught in class. Both instructors said that a majority of the meals were complicated and took too long to cook (especially when they had to rely on facilities' ovens, which were outdated).

When asked how the class could be improved, the instructors agreed that instead of separating participants into groups, the same information could have been conveyed during the cooking portion of the class. Instructors felt that it could be relatively easy to "weave in" information from the didactic portion during the cooking component. They also said they might change some of the recipes, as rural grocery stores did not always have ingredients the recipes required, causing them (and, ultimately, families) to need to make substitutions.

Conclusion

Families living in poverty face significant barriers to cooking healthful meals (Bowen et al., 2014; Haynes-Maslow et al., 2013; Reicks et al., 1994; Variyam et al., 1996). Extension can play a role in helping families develop cooking skills that have the potential to mitigate barriers to healthful cooking and eating. Surveys and focus group sessions addressing HAT showed that participants gained skills in meal planning, increased whole grain intake, and decreased saturated fat intake. Even with some improvements in food resource management, participants still reported major gaps in their ability to feed their families. This circumstance could be attributed to families not following all the food resource management strategies encouraged by HAT, including cooking at home, comparing food prices, and making a list before shopping.

Even after having had cooking classes, low-income parents may not have the finances to purchase foods recommended in the classes (Bowen et al., 2014; Daniel, 2016). However, family-based cooking classes can offer children the repeated food exposure needed for acquiring healthful food preferences. Enrolling children in family-based cooking classes can increase their confidence in food preparation skills and willingness to try new foods (Condrasky et al., 2015; Woodruff & Kirby, 2013).

Important factors to consider when delivering programs to low-income families include (a) types of delivery methods, (b) instructor training needs for cooking-intensive programs, (c) time required to prepare for and cook family-based meals, and (d) appropriateness of ingredients in recipes. Data from HAT instructors suggested that classes were too long (even though the development team tried to minimize preparation and clean-up time). This concern was mentioned in another study examining cooking programs (Franck, Vineyard, Olson, & Peterson, 2012).

What we learned from our study was the need to have less didactic instruction and more hands-on learning.

Having families spend more time cooking together could potentially increase the likelihood that parents will allow children to assist with meals at home. Although the HAT instructors we interviewed felt that participants did not grasp all class concepts, participants expressed that they did. This incongruence is an issue that those developing future programs could address by training instructors not to underestimate participants' nutrition literacy so that instructors can provide the appropriate level of information.

This is one of the first studies to focus on a family-based nutrition education and cooking program. Yet it had several limitations. The narrow geographic scope and small sample size limit the generalizability of our findings. Lastly, 24-hr recalls rely on self-reported information, a circumstance that could bias the results if participants do not accurately report their dietary intake.

Extension can play a major role in providing cooking classes that improve self-efficacy to cook, increase consumption of healthful food, improve food safety knowledge, increase cooking frequency at home, and increase money saved on food (Crawford, Ball, Mishra, Salmon, & Timperio, 2007; Cullen, Watson, Zakeri, Baronowski, & Baronowski, 2007; Larson, Perry, Story, & Neumark-Sztainer, 2006; Meehan, Yeh, & Spark, 2008). However, there are few studies that examine the impact of family-based cooking and nutrition education programs. We learned from HAT that future programs for families should involve combining nutrition education content with the cooking portion of the class.

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