

Family Perceptions of a Cooking and Nutrition Program for Low-Income Children and Adolescents

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Abstract

Background. Flint Kids Cook, a nutrition and culinary program for children and adolescents, was created in October 2017 to address health concerns among youth and families in a low-income, urban community. In this study, researchers examined family experiences with the 6-week, chef-led program, which was taught in a farmers' market kitchen. **Methods.** At the conclusion of each session, researchers used an open-ended focus group format to assess program experiences, perceived impact on youth self-efficacy for cooking and healthy eating, and caregiver support. This qualitative study was guided by thematic analysis. **Results.** Between November 2017 and December 2018, 72 caregivers (n = 38) and students (n = 34) participated in separate focus groups. Caregivers were primarily female (74%) and African American (71%). Most students were African American (76%) and half were female. Recurrent themes included food acceptance, dietary modifications, confidence in the kitchen, and program design. Caregivers and students agreed that location and design of the program alongside facilitation by an experienced chef were important factors for program success. **Conclusions.** This study demonstrated that a chef-led healthy cooking program for youth was effective in improving perceived food acceptance, dietary habits, and confidence in the kitchen. The program could be modeled in similar communities to address diet and health of children and adolescents.

Keywords

child, nutrition, cooking, qualitative research, low-income

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Background

Children and adolescents, particularly those living in low-income households, consistently fail to meet dietary recommendations.¹⁻⁴ Given the connection between poor dietary patterns among youth and negative health outcomes,⁵⁻⁹ there is a critical need for public health programs to address persistent barriers to healthy eating beyond basic nutrition education. Although numerous factors contribute to dietary inadequacies, a societal decline in culinary skills^{10,11} and related increase in frequency of away-from-home meals^{12,13} are well-recognized challenges to achieving healthy dietary habits among children and adolescents in the United States. Although some nutrition programs have responded by adding culinary skills instruction,¹⁴⁻¹⁶ few have utilized credentialed chefs as primary instructors.

Including a chef in nutrition education programs can promote long-term health by giving young people the knowledge and skills necessary to prepare nutritionally adequate meals and snacks.¹⁷⁻¹⁹ With the introduction of television programs and social media that involve children and adolescents cooking alongside

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chefs, there has been a “culinary awakening” among people of all ages, races, and socioeconomic backgrounds.¹¹ Recent studies have further suggested that watching television cooking shows may encourage consumption of certain foods among children.^{20,21} Considering the growing popularity of cooking shows alongside their potential to change dietary behaviors of children and adolescents, healthy cooking programs facilitated by credentialed chefs could have meaningful impacts on youth, especially those at greatest risk for poor dietary behaviors.^{3,22,23}

Flint Kids Cook (FKC), a nutrition and culinary program for children and adolescents, was created in October 2017 to address health concerns among youth and families exposed to lead-tainted drinking water in Flint, Michigan. As the crisis unfolded, caregivers of patients at Hurley Children’s Center, a large pediatric clinic in Flint, shared specific worries about child and adolescent nutrition, including limited food preparation skills in the home.²⁴ In direct response, a team of local chefs, registered dietitians, and researchers developed FKC. The intervention was grounded in social cognitive theory (SCT), which explains changes in behavior as the result of interactions between an individual’s personal and environmental systems.²⁵⁻²⁷ FKC provided interactive nutrition education and food preparation activities to improve youth knowledge, skills, and self-efficacy for cooking healthy snacks and meals at home. Environmental factors, such as caregiver support and access to healthy foods, were also addressed through the provision of take-home educational materials, recipes, and youth-friendly cooking utensils.²⁸

As described in an earlier publication that reported the program’s impact on health-related quality of life among students,²⁹ FKC comprised a total of 9 hours of instruction over the course of 6 consecutive weeks. Unique to the program was its facilitation by a credentialed chef, with the assistance of a registered dietitian, who taught every class in a farmers’ market commercial kitchen. Recipes and curriculum content were developed in accord with the United States Department of Agriculture’s (USDA’s) MyPlate.³⁰ During the 90-minute sessions, each dedicated to a specific food group, students (8-18 years of age) worked in groups of 3 to 4 to prepare 2 dishes that were representative of that week’s food group. The children and adolescents were also encouraged to practice at home using a “homework bag” distributed to them at the end of 3 separate classes. The reusable bags each held a recipe, ingredients, and a feedback sheet for students to describe experiences with food preparation at home. The 6-week series culminated in a celebratory family

dinner that the students prepared. Although caregivers did not participate in any of the classes, they were invited to observe each session from outside a window in the farmers’ market kitchen.

Purpose

The current study sought to qualitatively examine family experiences with FKC through the voices of students and their caregivers.

Methods

Study Design

This was a qualitative study of FKC, a healthy cooking program at a local farmers’ market for children and adolescents in a low-income, urban area. Researchers purposively sampled students who had completed FKC and their caregivers to assess family experiences with the program.

Study Setting and Recruitment

An estimated 60% of youth live below the poverty line in Flint, Michigan,³¹ and the community continues to struggle with a limited number of full-service grocery stores operating within city limits.³² A lead-in-water crisis that negatively impacted the health and well-being of children and adolescents in Flint has further exacerbated challenges with food access and affordability.^{33,34} In response to caregiver concerns about child nutrition, a team of local chefs, registered dietitians, and researchers developed FKC. Posters and flyers were displayed in local pediatric offices and partnering community sites in Flint to recruit students into the program. Children and adolescents who were 8 to 18 years old, spoke English, and had not participated in a prior session of FKC were eligible to participate. Although Flint residency was not required, most students reported living at a Flint address. Caregivers and students were not charged for enrollment or cooking incentives.

Qualitative Assessment

Following the tenets of qualitative methodology, the research team developed an open-ended focus group format to assess program experiences; impact on youth self-efficacy for cooking and healthy eating; and caregiver support. Two members of the research team, trained in qualitative research methods, facilitated focus groups. The focus group guide (Table 1) was developed using literature,¹⁴⁻¹⁶ SCT, and researchers’ experiences

Table 1. Relationship between Social Cognitive Theory, Concepts, and Questions.

Social cognitive theory	Concepts	Research questions	Focus group questions
Person	Knowledge	How do children perceive their own ability to prepare and consume healthy foods following participation in FKC?	<i>Caregivers:</i> Describe any changes in your child's nutrition knowledge or interest in nutrition since participating in FKC. <i>Children:</i> What did you learn in FKC?
	Skills		<i>Caregivers:</i> What changes have you noticed in your child's cooking skills since participating in FKC? <i>Children:</i> How did the class change the way you feel about cooking?
	Self-efficacy		<i>Children:</i> How do you feel about your own ability to cook? How do you feel about your own ability to eat healthy?
	Outcome expectancies		<i>Children:</i> What do you feel will be the result if you continue to cook the way you cooked in class? Why do you think it is important to learn to cook and eat healthy foods?
Environment	Support from others	To what extent did participation in FKC modify the food environment surrounding the child?	<i>Caregivers:</i> How did you support your child at home during the program? <i>Children:</i> What did your caregivers do at home to support you when you were participating in FKC?
	Modeling behavior		<i>Caregivers:</i> What changes did you notice in your own eating and cooking behaviors as a result of your child participating in FKC? <i>Children:</i> What changes did you notice in your caregivers' eating and cooking behaviors while you participated in FKC?
	Availability of healthy foods		<i>Caregivers:</i> What changes did you notice in your shopping behaviors as a result of your child participating in FKC? <i>Children:</i> What changes did you notice in food shopping behaviors while you were participating in FKC?

Abbreviation: FKC, Flint Kids Cook.

with the topic and population. Questions were exploratory with a focus on FKC and related relationships with dietary behaviors and meal preparation at home.

Researchers collected data via 11 separate semi-structured focus groups with caregivers (6 total groups) and students (5 total groups) between November 2017 and December 2018. All focus groups took place during the final class in the 6-week series; therefore, only caregivers and students in attendance on the final day were eligible. Caregiver focus groups occurred while students were preparing a meal for their families. Students participated in the focus groups immediately following meal preparation. Individuals participated in only 1 focus group, lasting 45 to 65 minutes. Mean number of participants was 7 for student focus groups (range 5-8) and 6 for caregiver focus groups (range 3-10). No incentive was provided for focus group participation. After a total of 72 caregivers and students participated in a focus group, researchers terminated data collection based on a

joint conclusion that data related to the primary research questions were repetitive, and no additional concepts were being observed.³⁵

Data Analysis

Focus group audio recordings were transcribed verbatim for textual data analysis. Researchers used a multi-step coding process, guided by thematic analysis,³⁶⁻³⁸ to uncover and analyze patterns across transcripts and formulate illustrative themes.³⁹ Three researchers completed an initial coding process, independently highlighting, labeling and developing potential categories for thematic purposes. Less reflective themes were then eliminated, and similar themes collapsed. Finally, explanatory quotations were selected to support the final themes and sub-themes. Descriptive data were recorded and analyzed using SPSS statistical software (version 23, IBM Corp., Armonk, NY, 2015).

Table 2. Characteristics of Focus Group Participants.

Characteristic	Students (n = 34)	Caregivers (n = 38)
Female	17 (50%)	28 (74%)
Male	17 (50%)	10 (26%)
African American	26 (76%)	27 (71%)
Caucasian	8 (24%)	11 (29%)
Flint resident	30 (88%)	
Non-Flint resident	4 (12%)	

Ethical Approval and Informed Consent

The current study received exempt status from the Michigan State University Institutional Review Board (IRB exemption number: x17-820e) for research conducted in commonly accepted educational settings that involves normal educational practices. Written consent was obtained from caregivers and assent was obtained from children and adolescents. The study was carried out in accordance with the ethical principles established by the Declaration of Helsinki.

Results

Between October 2017 and December 2018, 71 students (mean age 10.9 ± 2.3) participated in FKC. The majority of students were African American (85%) and residents of Flint (78%), and approximately half were female (51%). A total of 72 caregivers (n = 38) and students (n = 34) participated in focus groups to examine family perceptions of the program. As shown in Table 2, caregivers were primarily female (74%) and African American (71%). Most of the students who participated in focus group discussions (mean age 10.6 ± 2.2) were African American (76%) and residents of Flint (88%), and half were female (50%).

Presented below are the findings of the following recurrent themes that emerged during focus group discussions: (i) food acceptance; (ii) dietary modifications; (iii) confidence in the kitchen; and (iv) program design. These themes are organized in Table 3 according to associated sub-themes.

Food acceptance. Student engagement in food preparation during the program was credited with improving overall food acceptance. Many caregivers, who described their own children as “picky eaters,” shared how participation in the program improved willingness to try new foods at home (Table 3, sub-theme 1.1). Some said unfamiliar foods that were introduced during the program were later requested at home. Others recalled their surprise when watching their own children taste foods

during class that had been previously refused at home. Similarly, students discussed experimentation with a variety of foods during FKC classes as well as increased acceptance of new foods at home.

What I think has been the most beneficial for [my son] with this program is that he is trying new things; whereas before, he refused to try things. Like sweet potatoes, he said he hated sweet potatoes, but he had never tried them before. With him preparing them (in the class), it made him try them. Now, he is more open to trying new foods at home. (Caucasian female caregiver, 1C)

I have the courage to eat more healthy things that I didn't like before. . . I didn't like that many vegetables, but I like them now. I cook them, and I eat them raw. And I add them to my salads. I eat onions now, onions. (African American male, Age 10)

Many caregivers discussed their children's newfound desire to participate not only in food preparation, but also in food shopping (Table 3, sub-theme 1.2). In addition to receiving requests for foods that were introduced during the program, some caregivers said that children and adolescents started to talk more about food, particularly during trips to the grocery store. Several caregivers further described how their daughter or son began to purchase these foods with their own money.

She (daughter) will tell me, “Mom, I need you to pick up this and that from the store.” And if I come home from work without it, she will say, “Well, come on. We better put our coats on, so we can go to the store.” I say I'm tired, and she says, “It's okay, I'll get everything. You just walk in and pay.” (African American female caregiver, 1C)

Since the class, he (son) is constantly reminding the family that we should eat more of this or shouldn't have too much of that. So, he is conscious of it. And when we take him to the grocery store with us, he always runs and brings stuff to us and says, “We need this! We need this!” (African American male caregiver, 1C)

Dietary modifications. Caregivers and students recognized that the program included not only culinary education and

Table 3. Illustrative Quotes for Themes and Sub-themes.

Theme	Sub-theme	Illustrative quote
1. Food Acceptance	1. Picky eating	Well, I have a very, very, very picky child, my youngest one. And a lot of times he will just sit there and look at the food and say, "No, I don't want to eat that" or "No, that's nasty." Then, he started coming here, and he tasted mushrooms here. And he said that they were okay. . . It is helpful, coming to these cooking classes, especially for him. That way, when he gets home, he will be used to eating different stuff that he never thought he would eat. (African American female caregiver, 2C)
	2. Food shopping	They were always encouraging me to eat new foods, like foods that I thought I wouldn't like. (Caucasian female, age 8) My daughter swore she hated sweet potatoes, but the second she made the [recipe from class], she came home and said, "Buy sweet potatoes!" I looked at her like she was crazy, and she said, "I like them now." (Caucasian female caregiver, 1C) When we go to the grocery store, she (daughter) is like, "Buy this. Buy this." [She] gets a weekly allowance, so she also buys stuff on her own and brings it home and says, "I bought this, and I learned this (in class), and we had this (in class)." (African American female caregiver, 1C) She (daughter) has gotten better with knowledge as to what vegetables are what in the store. . . And we're going around the grocery store, and she is able to tell me this is this and that is that. "This is an eggplant, Mama. This is what you are supposed to do with it." (African American female caregiver, 1C)
2. Dietary Modifications	1. Healthy eating	Since he has been in the class, he has been more focused on nutrition in terms of vegetables, fruits, and all of the food groups. That we should have a little bit of each. (African American female caregiver, 1C) I think they are more consciously aware of what they are eating now. Before (the class), they knew that fruits and vegetables were good for them, but now they consciously think about, "Maybe I should have this instead of that." (Caucasian female caregiver, 2C) It changed the way I think about what to put in meals. Like before (the class), I didn't care about whether it was healthy or unhealthy, and now I am a little more considerate of what I am eating with my family. (Caucasian female, age 12)
	2. At-home meals	He (son) would rather stay in and eat. After school he used to say, "I'm hungry." And I would say, "Okay, wait until we get home, and we will make something." And he would say, "No, stop somewhere." Now, we just pull everything out of the cupboards, and he will go at it. He says, "We will have this. We will have this." (Caucasian female caregiver, 1C) I think there is a greater appreciation or an understanding of what goes into a meal at home. That it isn't just something that is coming out of a box. . . Understanding that I am not just going to get a box out of the fridge that is already cooked. I have everything to make this (at home), and I am going to make this. Or I have this, and I have this, and coming up with things on his own. (Caucasian male caregiver, 1C)
3. Confidence in the Kitchen	1. Child interest	[He] (son) has been asking to help in the kitchen, whereas before he had no interest in cooking or preparing anything. Now, he wants to (cook). So, that gets him downstairs and more active with family time. (Caucasian female caregiver, 1C) Missing just one day (of class) was like (shaking her head). They missed just that one day, and it was like a heartbreak. Then, Thursday morning came, and they said, "Mom, don't forget cooking class is today." (African American female caregiver, 3C) My daughter loves the program. It's almost like she can't wait until Thursday gets here. She didn't pick to be a chef, but she does love cooking as a hobby. (African American female caregiver, 1C)
	2. Cooking skills	He (son) is able to go into the kitchen now. He knows more about safety and what not to do from this class. Before (the class), he had to stand at the door and beg someone to fix him whatever he wanted. He couldn't even use my microwave. (African American female caregiver, 4C) The first thing I learned is more about the food around me, and I had a lot of fun. But the other thing I learned, I learned a lot more about cutting. How to do it without cutting yourself. (Caucasian Female, age 12)

(continued)

Table 3. (continued)

Theme	Sub-theme	Illustrative quote
	3. Future impacts	It's important for kids, for anybody, to develop cooking skills because you're going to need them. You're not always going to have money to get your [fast food] or whatever. You're going to have to be home and cook. Momma definitely will not cook for you after 18, so you are going to have to learn to survive on your own. (African American female caregiver, 4C) The program aligns with [her] career goals. [She] intends to be a chef when she grows up. We are always trying to feed these things to her to explore future careers, and I appreciate that this (FKC) helps her along. (African American female caregiver, 1C) I think it's important to learn how to cook because some people that are old don't know how to boil an egg. I think it's important to know how to cook when you're older, so you have to go to a cooking class now. (African American female, age 10)
4. Program Design	1. Structure and setting	I thought it was very practical. The things that the chef chose to work on were very, very practical, and it was a wide variety of things. They were side dishes, there were desserts, there were snacks, there were smoothies, there was a main course. It wasn't just a kids cooking class to learn how to cut apples and stick raisins on them and stuff like that. It was a wide variety of foods. (Caucasian male caregiver, 1C) My most favorite part was working together to make the food. (Caucasian male, age 11) I wouldn't like it in my school because we don't have a big enough kitchen for all of us who are in here. (Caucasian female, age 11)
	2. Chef as instructor	I think that my daughter liked saying that she was going to a cooking class that was taught by a chef. Instead of just somebody off the street. She liked to say, "The chef taught me how to do this." (African American female caregiver, 2C) You've got somebody who knows the food safety and everything else. Knows the equipment. There is a professional way of doing things, and I think that is valuable. Plus, you have somebody who does this as a profession. They are going to care more about it. (Caucasian male caregiver, 1C) Not taking away from the skills of a food preparer, but I think it's definitely the title. I mean if you had some type of medical program and the doctor was there every week as opposed to the orderly. You might be just as knowledgeable, but it's the prestige of a doctor. (African American male caregiver, 1C)
	3. Take-home recipes	What I liked the most about the program was that the children were given ingredients to take home and prepare those items at home. (African American female caregiver, 1C) When we are driving home (from FKC), she's always excited about cooking stuff for the family, and she wants to surprise us. It's easy (take-home) recipes that they can make themselves, so she is really proud of that. This cooking will make her independent too. (Caucasian female caregiver, 1C)

Abbreviations: FKC, Flint Kids Cook; #C, number of children in the household who participated in FKC.

cooking, but also instruction related to the importance of proper nutrition. Most credited FKC with encouraging healthy eating habits at home (Table 3; sub-theme 2.1). Some caregivers described an increased awareness of foods during the program, noting that their daughter or son made requests for more variety in meals and snacks prepared at home, particularly in relation to fruits and vegetables. Similarly, students talked about a desire to eat healthier as their food preparation skills improved.

[My daughter] tries to have more of a balanced lunch now. She thinks more about it. In the morning, she used to pack a peanut butter and jelly sandwich with tortilla chips. She used to eat that every day of the month. She thinks more about it now. She says, "I need a veggie. I need fiber or whole grain." (Caucasian female caregiver, 1C)

For me, it was hard to eat healthy because I didn't like healthy stuff. But now, I realize that I can make my own healthy stuff, and I feel a lot better about it. (Caucasian male, age 11)

Many caregivers discussed a decrease in consumption of meals and snacks away from home as interest in food preparation grew (Table 3; sub-theme 2.2). Some shared that children and adolescents were less likely to request fast food and pre-packaged foods while participating in the program. Others discussed how their children became more interested in preparing fresh foods at home.

I have noticed a difference in [my son]. He has a more positive outlook on cooking and what it is he is actually putting in his body. So, rather than a quick run to McDonald's before (the class), he will say, "Well, what's in the refrigerator? Can we find something to eat in the refrigerator?" (Caucasian female caregiver, 1C)

He (son) is eating more food that's been prepared at home, less snack foods and more meals because he wants to cook. He cooks it, and he will eat it. (African American female caregiver, 1C)

Confidence in the kitchen. Caregivers and students described a new feeling of confidence that resulted from participation in FKC. Caregivers specifically noted the influence of the program on youth interest in cooking (Table 3; sub-theme 3.1). Nearly every caregiver talked about their student's strong desire to attend class every week, sharing stories of notes left throughout their homes to remind caregivers of the cooking classes or wearing FKC aprons when they returned home from school. Caregivers who watched the classes from outside the kitchen also commented on student engagement during the sessions.

[The class] encouraged him to come into the kitchen. Last night he came into the kitchen, and he actually helped me cook dinner. He was playing a video game, and he stopped playing and told his friend, "I got to help my mom cook. I'll be back." I was shocked. (African American female caregiver, 1C)

He (son) don't want to miss (the class). And he gets home, and he puts his apron on, and he helps in the kitchen. [He says.] "Let me show you how to do this and that." We have been working together. (African American male caregiver, 1C)

Many caregivers talked about feeling more comfortable with their child or adolescent cooking at home because of noticeable improvements in cooking skills during the program (Table 3; sub-theme 3.2). Some caregivers were reluctant to allow their daughter or son to cook independently prior to participation in FKC. However, after learning proper food preparation techniques from an experienced chef, caregivers expressed a willingness to support students in practicing these skills at home. Similarly, students credited the class for facilitating improvements in cooking skills.

The program has helped me a lot because I am an overprotective parent. I don't just let her (daughter) in the kitchen. But now, she has been (to the class) and she says, "Mama I know how to do this. I can do it." And I let her venture off a little bit more than what I normally have. And it is coming together from what I teach her at home and what the program has given her. It's coming together a lot for her. (African American female caregiver, 1C)

I used to be kind of bad at cooking. My mom would have to do most of the stuff. I would just stir up stuff, but now I can help her cook because I know how to cook. I feel like I can do much more. Some stuff my mom lets me cook at home by myself because I started the cooking class. (African American female, age 10)

Caregivers discussed the importance of FKC in teaching life-skills (Table 3; sub-theme 3.3). Many highlighted the importance of cooking at home in contrast to purchasing prepared meals or fast foods and, as a result, shared intentions to continue to support their children's growing interest in food preparation. Some caregivers, whose daughter or son enrolled in the class with an interest in a career in culinary arts, acknowledged how the program reinforced this as a career option. Similarly, students recognized the importance of learning to prepare foods as they grow older to support a healthy lifestyle.

He (son) will take this with him when he is an adult. He can teach his kids how to cook and eat, you know, the lifestyle. You don't want them growing up and thinking that fast food

is the only way after they leave home. It's a lifestyle, and you have to teach them. (African American female caregiver, 1C)

I think it's important to know how to cook because sometimes people don't have a boyfriend or a girlfriend, and they can't cook. So, they eat at [fast food restaurants] every night. And people will turn obese. You got to cook for yourself. (African American female, age 11)

Program design. Caregivers and students agreed that location and design of the program were important for success. FKC was facilitated inside of a farmers' market kitchen where students worked at large tables in teams of 3 to 4. It was necessary for students and families to walk through the farmers' market to reach the kitchen. Students talked extensively about the classroom structure and setting that encouraged hands-on learning and teamwork (Table 3; subtheme 4.1). Most preferred the farmers' market kitchen to their school kitchens, which were often regarded as either too small to support the program or entirely absent within their schools. Caregivers appreciated the large kitchen as well as the exposure to a variety of fresh foods available within the farmers' market.

I can show it to him at home, but he was in a different kitchen, this bigger kitchen. And it's in the perfect spot, the farmers' market. If you think like a kid when you come into a farmers' market and see all of these different vendors. They actually got to look around, and they can even walk up to the vendors and ask them, "What is that? Did you make that?" They can ask a lot of questions. So, I think this was the perfect spot. (African American female, 3C)

I would feel horrible if this class was at my school because my school does not have a big kitchen, and this kitchen is enough space for all of us. (African American male, age 9)

Nearly every caregiver and student pointed to the importance of the experienced chef who facilitated the classes (Table 3; subtheme 4.2). The chef was regarded as engaging and knowledgeable by caregivers, who felt at ease leaving their daughter or son in a kitchen given the chef's experience and training. Similarly, students expressed admiration and respect for the chef, who taught culinary skills while transforming recipes into healthy meals and snacks.

It needs to be a chef. I mean, my kids would have been disappointed had it not been a chef. . . . They were so excited, it's always "Chef (name)." They were always talking about Chef (name). (Caucasian female caregiver, 2C)

The paper said we were going to be taught by a real chef. If that wasn't true, I would have been so mad. . . . Chef (name) is the best chef I have ever met because I have been to a lot of restaurants, and they have mostly unhealthy types of food. (African American male, age 9)

Take-home recipes with necessary ingredients were supplied to students at the end of 3 of 6 class sessions (Table 3; subtheme 4.3). Many caregivers discussed the importance of these recipes in encouraging youth to cook at home with their families and practice skills learned during the program. Some even shared how their daughter or son modified take-home recipes to create a different meal or snack.

Every time they bring food from here (take-home recipes), they take it home, and they cook it. My daughter's first time here, she went home and made vegetable pot pies. That's the first thing she did when she came home. (African American female caregiver, 3C)

The stuff that was sent home for the granola, they didn't do that. Instead, they cooked the oatmeal and then they chopped up the dates and raisins and added apples and different fruits. . . . So, they read over the recipes that were sent home and came to me saying, "We like this, but we are going to change it." (African American female caregiver, 4C)

Discussion

Previous research reported significant improvements in cooking skills, attitude toward cooking, and health-related quality of life among children and adolescents who participated in FKC.²⁹ The current study further illustrates that caregivers and students perceive the program to have a positive influence on food acceptance, dietary habits, food preparation at home, and interest in cooking among students. Central to our findings was the importance of a credentialed chef facilitator who was acknowledged by caregivers and students for skillfully teaching food preparation and recipe modification. Students agreed that the inclusion of the chef was critical to their enjoyment and learning throughout the program. In addition, many caregivers, who watched outside the kitchen during the classes, credited the chef with capturing the attention of young students during the program. This finding supports limited research that has suggested experiential cooking and nutrition programs facilitated by chefs may be effective in increasing learning and enjoyment among children and adolescents.¹⁹

The site of the program was also considered important to success. Although a recent review suggested that integration of culinary programs within the academic

curricula may improve their effectiveness,¹¹ limitations of schools that are located in low-income areas should be acknowledged. Most children and adolescents who participated in focus group discussions felt strongly about facilitation of the class within a kitchen but indicated that kitchens within their schools were either too small to accommodate the class or altogether absent. Most felt that changing the location of FKC to their respective schools would lessen both impact and enjoyment. Caregivers further appreciated that the location of FKC exposed their daughter or son to fresh, locally grown foods, as well as farmers in the community. With previous evidence suggesting that farmers' market nutrition programs are associated with increases in child consumption of fruits and vegetables,⁴⁰ healthy cooking programs that simultaneously expose youth to farmers' market kitchens and fresh, local foods have strong potential to enhance learning and behavior.

Research suggests that Americans are increasingly eating meals away from home, a behavior that has consistently been associated with adverse nutritional consequences.^{12,41,42} Although not specifically measured in the current study, caregivers talked extensively about the impact of FKC on fast foods purchasing. When presented with options, most caregivers indicated that children and adolescents preferred experimenting with foods at home rather than purchasing prepared or fast foods while they were participating in the program. Caregivers credited FKC with this specific change in child and adolescent dietary behaviors. Given the association between eating meals and snacks away from home and health of youth,^{12,13,41} this particular finding is notable.

Finally, the current study supports previous literature demonstrating that early experiences with food have a formative impact on dietary behaviors.²² Interestingly, the impact of the current program reached beyond the home and into grocery stores. Many caregivers shared specific experiences related to youth interest in food shopping while participating in FKC. This finding is particularly important considering recent evidence that suggests child involvement in food purchasing helps direct food choices to unfamiliar foods that are healthy.⁴³ Future research will investigate the influence of FKC on household food shopping and household food environment using validated assessments.

Limitations of the current study should be acknowledged. The sample was small and specific to 1 program that targeted children and adolescents residing in a low-income, urban area. Therefore, results may not be generalizable to a broader population. However, FKC could certainly be modeled in areas confronted with similar challenges related to youth dietary patterns and access to

innovative nutrition and health programs. Although such areas may face challenges securing funding and access for similar programs, limitations of alternative designs must be considered, as caregivers and students alike identified the program's facilitation by a chef and location inside a farmers' market commercial kitchen as key components of its success. Lastly, there may have been selection bias if feedback from families who chose not to participate in focus groups or were absent from the final session differed from those who agreed to share their experiences. It is important to note, however, that every student and nearly every caregiver asked to participate in the focus groups agreed to do so.

Conclusions

Although research suggests that cooking programs may positively influence food-related preferences and behaviors among children and adolescents,¹⁴⁻¹⁶ multiple knowledge gaps related to youth experiences, ideal program length, and intervention components remain.¹⁴ The current study demonstrated that a chef-led healthy cooking program designed to engage and educate children and adolescents was perceived as effective in improving student food acceptance, dietary habits, and confidence in the kitchen. Given recent challenges related to COVID-19, future research will investigate feasibility and preliminary effectiveness of a virtual version of FKC.

Author Contributions

AS-C conceived the study, study design and analysis; collected data; led analysis of the data; and led all writing and drafting of the manuscript. MG recruited participants into the study, collected data, and participated in data analysis and drafting of the manuscript. HCL contributed significantly to interpretation of results and drafting of the manuscript. MH-A assisted in conceptualization of the study and the drafting and revising of the manuscript. ON participated in data collection and drafting and revising of the manuscript.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethical Approval

This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving research study participants were approved by the Michigan State University Human Research Protection Program. Written informed consent was obtained from all subjects/patients.

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