



Flint Families Cook: A Virtual Cooking and Nutrition Program for Families

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INTRODUCTION

Amid parental concerns regarding poor nutrition and lack of cooking skills among youth in Flint, Michigan,¹ a team of local dietitians, chefs, and researchers created *Flint Kids Cook* (FKC). The program was grounded in Social Cognitive Theory,² focusing on improving youth knowledge, skills, and self-efficacy for cooking fresh, healthy foods. A trained chef and registered dietitian co-facilitated interactive lessons designed to increase knowledge and develop skills to prepare healthy meals and snacks at home. Culinary instruction centered on improving youth knowledge of recipe preparation using fresh or minimally processed foods and developing analytical skills needed for proper measurement and modification of recipe ingredients. Nutrition instruction, guided by the US Department of Agriculture's MyPlate,³ highlighted the importance of each food group in a healthy diet. Children provided feedback after each class related to recipes, nutrition instruction, and culinary content, and most families participated in focus group discussions at the end of each 6-week session.⁴ Participant feedback was used to modify recipes, adjust class times, and expand to new program sites. FKC demonstrated early success in reaching low-income youth and

improving cooking self-efficacy, attitude towards cooking, and quality of life of young participants.⁵

In March 2020, the State of Michigan issued an executive order in response to the coronavirus disease 2019 pandemic that resulted in an immediate pause of all in-person FKC classes. In January 2021, we introduced a modified virtual version of FKC, entitled *Flint Families Cook*. Although this 5-week program, co-facilitated by a chef and dietitian, maintained the objectives of the original program, it was designed to also encourage families to cook healthy meals at home together.

PROGRAM DESCRIPTION

Local pediatric clinics and community sites, such as farmers' markets and Boys and Girls Club, advertised *Flint Families Cook* through posters and handouts that include a QR code for easy enrollment. A local food hub also included handouts in food boxes delivered to homes in Flint and surrounding areas. The FKC Facebook Page provided program updates and a link for enrollment. Families with children aged 8–18 years who are English-speaking and had not participated in FKC may enroll, regardless of residency or income. A secure digital platform (Michigan State University Qualtrics, Qualtrics, 2021) was used to

collect enrollment and consent forms before participation. Identical classes were offered, free of charge, Wednesday and Thursday evenings.

Flint Families Cook provided 7.5 hours of live, virtual instruction over 5 consecutive weeks. Families accessed the program, broadcast from a teaching kitchen near Flint, on their personal computers, tablets, or phones through a Zoom (Zoom, Zoom Video Communications, Inc, 2020) link emailed to caregivers each week. Children and families learned proper techniques for using knives, measuring and mixing, sautéing, roasting, and baking from a chef, while a dietitian focused on nutrition and health benefits of specific food groups and nutrients, alone and in combination. With curriculum content and recipes informed by the US Department of Agriculture's MyPlate,³ each 90-minute class highlighted a specific food group. Every week, families prepared 2 dishes featuring the food group of discussion (Table 1; Figure 1). In addition to discussions about the importance of eating fresh, nutrient-dense foods, the chef and dietitian taught families about recipe modification, kitchen safety, and the benefits of family meals. Table 1 shows how we adapted FKC's curriculum for *Flint Families Cook*. To increase accessibility, we replaced 1 recipe that required families to have a blender at home. We also eliminated Week 6, when children prepared meals for their families. Table 2 illustrates variations between FKC and *Flint Families Cook* related to food, cooking tools, chef oversight, and child skill level.

PROGRAM EVALUATION

This study received exempt status from Michigan State University Institutional Review Board. Using previously validated surveys,^{6–8} children completed

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Table 1. Modified Curriculum for *Flint Families Cook*

Lesson Topic	Nutrition Learning Objective	Cooking Learning Objective	Recipes and Key Ingredients
Week 1: Fruit	<ul style="list-style-type: none"> Describe the food groups found in MyPlate Understand the health benefits of including fruits in the diet Identify forms of fruits that contribute to a healthy diet Recognize Michigan-grown fruits 	<ul style="list-style-type: none"> Read and follow a recipe Use a knife safely and effectively Accurately measure ingredients Use a blender with assistance^a 	<ul style="list-style-type: none"> Apple Crisp <ul style="list-style-type: none"> Apples, oats, cinnamon Breakfast Smoothies^a <ul style="list-style-type: none"> Greek yogurt, berries, bananas, pineapple Banana Cookies^b <ul style="list-style-type: none"> Banana, oats, whole wheat flour
Week 2: Veggies	<ul style="list-style-type: none"> Understand the health benefits of including veggies in the diet Recognize portion sizes for fruits and veggies List Michigan-grown vegetables Name benefits to eating locally grown produce^a Describe the benefits of eating meals together as a family^b 	<ul style="list-style-type: none"> Peel and chop vegetables Sauté vegetables on the stovetop 	<ul style="list-style-type: none"> Muffin Tin “Pot Pies” <ul style="list-style-type: none"> Carrots, beans, peas, corn Teriyaki Green Beans <ul style="list-style-type: none"> Green beans, orange juice, soy sauce, almonds
Week 3: Protein	<ul style="list-style-type: none"> Identify foods that contain protein List physiological functions of protein in the body Use a nutrition facts label to compare the nutritional content of different proteins Recognize the health benefits of including lean meats and plant-based proteins in the diet 	<ul style="list-style-type: none"> Chop an onion Make a soup using boiling and simmering techniques Make dumplings 	<ul style="list-style-type: none"> Chicken and Dumplings <ul style="list-style-type: none"> Chicken breast, mixed vegetables, low sodium chicken stock Chicken Tacos <ul style="list-style-type: none"> Chicken breast, bell peppers, onions, whole wheat tortillas Mango Salsa^a <ul style="list-style-type: none"> Mangos, red onions, cucumbers
Week 4: Grains	<ul style="list-style-type: none"> Differentiate whole grains from refined grains Determine the type of grains found in packaged foods using the nutrition facts label Explain the health benefits associated with whole grains 	<ul style="list-style-type: none"> Prepare a mixed dish on the stovetop Use a can opener Whisk ingredients Use a pizza cutter 	<ul style="list-style-type: none"> Fruity Rice <ul style="list-style-type: none"> Brown rice, sweet potatoes, pear, dried apricots Breakfast Granola Bars <ul style="list-style-type: none"> Oats, pumpkin, cranberries, sunflower seeds
Week 5: Dairy	<ul style="list-style-type: none"> Identify dairy foods Name an important nutrient found in dairy products Recognize health benefits associated with consuming low-fat dairy List nondairy products that contain calcium 	<ul style="list-style-type: none"> Modify a recipe to increase nutritional value Cook pasta Separate an egg Bread food Plan a meal (for week 6)^a 	<ul style="list-style-type: none"> Stovetop Mac and Cheese <ul style="list-style-type: none"> Shredded cheese, low-fat cream cheese, skim milk, whole wheat noodles Crispy Baked Cheese Sticks <ul style="list-style-type: none"> String cheese, breadcrumbs Fresh Marinara Sauce <ul style="list-style-type: none"> Canned tomatoes, Italian seasoning
Week 6: Kid's choice ^a	<ul style="list-style-type: none"> Use MyPlate recommendations to plan a balanced meal^a Build a healthy meal with foods from each food group^a 	<ul style="list-style-type: none"> Collaboratively cook with others^a Manage time effectively to prepare multiple dishes^a Prepare a well-balanced meal^a 	<ul style="list-style-type: none"> Kid's Choice—1 recipe from each previous week^a <ul style="list-style-type: none"> Fruit, vegetable, protein, grain, dairy

^aCurriculum for *Flint Kids Cook* only; ^bCurriculum for *Flint Families Cook* only.

Note: Text (excluding text with a superscript letter [a or b]) represents the curriculum for *Flint Kids Cook and Flint Families Cook*. Table adapted from “Table 1: *Flint Kids Cook* lessons, topics and activities” in previous publication by Saxe-Custack et al.⁵

assessments during enrollment and at program exit. Cooking self-efficacy was assessed using a validity-tested 8-item self-efficacy survey that previously demonstrated internal consistency and test-retest reliability such that individual test-retest scores were significantly correlated.⁶ A sample question was “I

can measure ingredients.” Six questions were extracted from a 14-item instrument that assessed both fruit and vegetable self-efficacy and proxy efficacy. The instrument, which previously demonstrated acceptable factorial validity, reliability, and criterion validity in late-elementary-aged

students, was used to evaluate self-efficacy expectations for consuming fruits (3) and vegetables (3).⁷ A sample question was “How sure are you that you can eat 2 servings of vegetables each day?” Nutrition knowledge was assessed using 15 items from a previously developed 16-item tool that



Figure 1. Photographs submitted by families that participated in *Flint Families Cook*.

Table 2. Modified Class Logistics for Virtual Programming

Topic	<i>Flint Kids Cook</i>	<i>Flint Families Cook</i>
Food	The chef purchased food and divided it among the kitchen cooking stations immediately before class each week.	Food boxes with ingredients and recipe cards were prepared for families by a local food hub. The boxes were delivered to participant homes and the teaching kitchen 1–2 days before class each week.
Cooking tools	The chef arranged kitchen cooking stations with necessary cooking tools before class each week.	During program enrollment, caregivers indicated whether they were missing essential tools to make class recipes (eg, measuring cups). Any missing items were provided in the first food box. In addition, families were provided a list of required cooking tools to prepare recipes each week. The chef also suggested alternative equipment options (eg, use a fork in place of a whisk).
Cooking technique oversight	The chef, dietitian, and program staff oversaw child cooking techniques and provided hands-on assistance throughout classes.	Caregivers oversaw child cooking techniques during the chef demonstrations, with the chef available to answer questions and assist over Zoom in real-time. The dietitian monitored families throughout the class to ensure all were progressing together and had the support they needed.
Child age and skill level	Younger children were deliberately paired with older children, who served as mentors and performed more advanced cooking skills.	Older siblings helped younger siblings, and caregivers and other family members provided additional support to ensure cooking tasks were completed safely and correctly. Recipe cards were delivered before class, allowing families to preview the cooking skills and prepare as needed. Future classes may be stratified on the basis of child age/cooking skill level.

Table 3. Feedback from Families who Participated in *Flint Families Cook* Focus Groups (n = 22) and Corresponding Program Adjustments

Topic	Illustrative Quote	Changes to <i>Flint Families Cook</i>
Family time	"[Daughter] and I would do the first recipe. My son and daughter would do the second recipe together. . . My daughter and I bonded over this and had a lot of fun." Male caregiver, 2 children	Not applicable
Class speed	"[We] got behind with the chopping and had a little bit of anxiety because [the kids] weren't keeping up." Female caregiver, 1 child	<i>Flint Families Cook</i> slowed the cooking segments and added periodic "thumbs-up" check-ins to ensure that all participants were ready before moving on with recipe preparation.
Recipe preparation	"Maybe some of the meal prep could happen before class, so the kids don't seem rushed doing it and trying to keep up." Female caregiver, 1 child	Recipe cards now include chef hat icons beside optional preparation steps that may be completed before classes.
Connecting outside of class	"I would love to see pictures of some of the families' final product of food. I think it would be another way for us to engage." Female caregiver, 1 child	A private Facebook group for families was created for each session. This space allows participating families to post photographs, share comments, and stay in touch outside class.

demonstrated reliability.⁸ A sample question was "Match each nutrient with the food that contains the nutrient." Data were analyzed using SPSS (version 27, IBM Corp., 2020) with significance set at $P < 0.05$. Paired sample t tests examined changes from program enrollment to program exit.

A total of 22 families also participated in focus group discussions 1 week after their classes concluded (week 6). All families were invited to participate in focus groups during the 5-week program and reminded each week that these voluntary discussions would take place virtually, at the same time as the scheduled classes. These sessions were formative and designed to gather feedback from participants in a deliberate effort to continually improve the program.

IMPACT AND IMPLICATIONS FOR PRACTICE

Since January 2021, 80 children from 55 families have participated in *Flint Families Cook*. Each 5-week session included 4 to 8 families, with an average of 6 families per session. Nearly 80% of families attended at least 4 of 5 sessions. As reported by caregivers, most young participants (mean age

11.5 ± 2.4; range 8–17 years) were African American (70%) and residents of Flint (78%). Nearly two-thirds were female (63%).

The 60 children from 43 families who attended at least 2 sessions and completed surveys at enrollment and exit reported improvements in cooking self-efficacy ($P < 0.001$), nutrition knowledge ($P = 0.005$), and self-efficacy for consuming fruits and vegetables ($P = 0.02$). Table 3 presents feedback from focus group discussions and corresponding program adjustments.

In addition to holding a growing waitlist of eager families, *Flint Families Cook* appears to address challenges with preparing and consuming healthy foods at home. Communities with similar concerns about child nutrition may benefit from implementing such programming. Collaborating with local partners and collecting feedback from participants will enable similar programs to tailor operations to their specific audiences and likely contribute to program success. In communities with limited internet/data coverage, programs may need to modify or provide additional support. Although we developed *Flint Families Cook* in response to coronavirus disease 2019, with in-person programming soon to resume, findings suggest that continuing to offer the current virtual format would be

worthwhile. The family-based, virtual format directly engages families in cooking healthy meals together and expands the program's reach to entire households, as well as extended family and friends. Importantly, the virtual format also tackles transportation issues many families with low income face in Flint.

NOTES

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