



Achieving a healthy home food environment: perspectives on parents' nutrition education needs when living with food insecurity

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Abstract

Purpose The familial food environment is influenced by many factors, including food insecurity, food accessibility, and foods accepted by the family. These factors can facilitate or hinder caregivers' ability to support a healthy home food environment. The aim of this research was to explore the barriers to, perspectives on, and nutrition education needs identified by food-insecure parents which would then inform a community-based nutrition education program.

Methods A qualitative study used focus group data that were recorded, transcribed verbatim, and analyzed using a constant comparison approach to categorize the emerging themes.

Results Emergent themes: (1) Cooking confidence deficit; (2) Healthy meal preparation barriers; (3) Healthy meal acceptance barriers; (4) Meal planning, management, and adaptability. These themes suggest that supporting a healthy home food environment is connected to both food knowledge and competencies, known as food literacy.

Conclusion Food literacy competency should be assessed before nutrition education program implementation within community settings.

Keywords Nutrition education · Food insecurity · Food literacy · Barriers to healthy eating · Focus group

Introduction

An estimated 38.3 million Americans reported living with food insecurity in 2020, of which 6.1 million children lived in food-insecure households [1, 2]. Families living in poverty face complex social and economic barriers that can limit adequate, affordable, and nutritious food choices necessary to support a healthy home food environment [3, 4]. A nutritionally healthy home depends on parents' health behaviors, nutrition knowledge, and confidence in making healthy choices. Parents are thought to be role models of healthful dietary intake, and their food habits and nutritional

awareness can significantly influence a child's eating behavior and food choices [3]. Parents who lack an understanding of the everyday practicalities associated with healthy eating are ill-equipped to model and encourage healthy family habits [3, 5]. When parents face economic barriers that limit food access whether in conjunction with foundational food knowledge and skills deficits or not, the ability to create and sustain a healthy home is diminished even further [6].

Families experiencing food insecurity may rely on supplemental food resources such as food pantries (FPs) and supplementary food assistance programs [7]. FPs were initially designed as an emergency food source but presently serve as an ongoing monthly grocery source [8]. Recently, many FPs have adopted new approaches and initiatives to assist clients in selecting healthier options, inclusive of environmental cues like stoplight nutrition rating systems and educational programming that teaches clients about nutrition, food preparation, utilization, and meal planning [9–11]. These efforts coincide with research showing that lower parental cooking self-efficacy—the belief they can successfully perform a behavior—and meal planning ability are associated with less healthful home food environments [12, 13]. Therefore, self-efficacy is considered one of the key

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determinants of health behavior change and requires the cultivation of physical, social, economic, and human resources and capacities [13, 14]. However, the current literature recognizes a dearth of community-based and parent-focused nutrition education programs to facilitate concepts such as healthful family behaviors, meal planning, and modeling of good behaviors [15, 16].

Nutrition education programs targeting parents' role model health-promoting behaviors are intended to equip these "gatekeepers" better to provide a healthy food home environment and may improve their children's health and BMI [3, 17, 18]. Parents need socially, culturally relevant, and feasible resources, especially when dealing with food insecurity barriers. Programs housed in settings such as FPs have great potential to serve an audience such as parents living with food insecurity. The purpose of this study was twofold. First, to explore the obstacles to healthy eating and meal preparation as reported by parents living with food insecurity. Second, to make recommendations for how to best facilitate the tailoring of future public health interventions and nutrition education programs specific to this population.

Materials and methods

Setting

Martha's Choice Marketplace (MCM) is an FP housed within the Catholic Social Services (CSS) Family Service Center in Montgomery County, Norristown, Pennsylvania (PA) [19]. MCM is one of the largest FPs in southeastern PA. According to Map the Meal Gap 2020, 1.4 million people, including nearly 400,000 children, suffered from food insecurity in the state of Pennsylvania before the COVID-19 pandemic [20]. MCM provided assistance to 12,000 families during 2020 and served more than 1.2 million pounds of food [19]. Villanova University maintains a partnership with CSS and MCM and provides ongoing support for community-based education classes, including parenting education and nutrition education programs which have been in existence since Spring 2018 [21, 22].

Participants and recruitment

In February 2019, the Villanova University Fitzpatrick College of Nursing (FCN) and MacDonald Center for Obesity Prevention and Education (COPE) research team attended a CSS parenting class to recruit focus group participants to serve as key informants and future nutrition education program participants, while discussing their parental perspectives and barriers to healthy eating practices for families. Parents could simply state they were interested in

participating in the focus group session after the information session and they provided written informed consent. A pool of up to twenty parents was sought; however, only fifteen adults ultimately enrolled in the parenting class, of which only nine agreed to participate in the focus group. Since the overall aim of this focus group was to assess the perspectives among parents living with food insecurity, the recruitment pool was limited by our access to this particular group of parents with whom the research team had an established relationship. Monetary compensation was provided at the conclusion of the focus group. Approval was obtained from Villanova University's Institutional Review Board with approval number IRB-FY2019-85.

Design

A focus group methodology was chosen as the primary research technique, commonly used in social science research [23]. Due to the small group size, this qualitative method was appropriate to focus on narratives instead of numbers to best describe personal practices, experiences, and views regarding a healthy home food environment [24]. The focus group session utilized a focus group discussion guide and questions explored obstacles related to healthy eating and food resource management by parents living with food insecurity (Table 1).

Instruments

The focus group questions were based on the Moderator Discussion Guide from the Community Food Project Evaluation Toolkit sponsored by the United States Department of Agriculture (USDA) Community Food Projects Program and all questions were piloted and revised before use (Table 1) [25]. Socio-demographic characteristics of the participants were obtained; as well as the prevalence estimates of food insecurity obtained from the 6-item USDA food security module short form to provide context behind the behaviors and experiences associated with difficulty in meeting food needs [26]. Federal Food Assistance program participation was also assessed to provide context to the availability of food resources (Table 2).

Data collection

Each research team member was experienced in qualitative research and conducting focus groups in an FP setting. Two researchers conducted the focus group, one as the primary interviewer, and the other as the scribe who took notes and managed the audio recording device. The one-hour focus group was audio-recorded and professionally transcribed. The transcript was validated and corrected by comparing it to the original audio recording. The focus group was not

Table 1 Example questions from the semistructured interview guide ($n=9$)

1. The Community Cooks program started within MCM and taught healthy eating and cooking tips using foods at MCM
 - a. What, if anything, have you heard about the Community Cooks program?
2. Within the next month or so, the peer mentors will be coming to your parenting class to share nutrition education and necessary cooking skills with the parents enrolled in these classes
 - a. What would you like to get out of this program?
 - b. What new things about nutrition or healthy cooking would you like to learn?
 - c. Are there things you already do that you would like to get better at doing?
3. This program is about learning about healthy eating and cooking healthier meals
 - a. How do you feel about learning to eat healthy and cook healthier?
 - b. Do you think eating healthy is important to most people?
 - c. What gets in the way of cooking healthy for you?
 - d. What do you think we should include in the program to help make it easier for people to eat healthy, cook healthy?
 - e. What kinds of messages should we include in the program to help inspire people to eat healthier and learn to cook healthy meals?
4. Tell us about your food choices and how you choose what to eat
 - a. How do you decide what to buy or choose?
 - b. What kinds of foods do you struggle with knowing how to prepare?
 - c. What makes it difficult for the MCM community to cook healthy?
 - d. What kinds of recipes should we include as part of the program?
5. What should not be included as part of this program?
 - a. Are there any foods we should NOT include due to religious preference?

intended to be an exhaustive exploration of parents living with food insecurity, nor can data saturation be confirmed due to the small sample size, rather the information gleaned from the focus group was intended to explore obstacles for healthy eating and meal preparation and how to best use results when designing future interventions for low-income parent populations.

Data analysis

The focus group data were analyzed independently by authors TO and RS. Constant comparison was the analytic method used to categorize the emerging themes [23]. The initial themes were identified based on the focus group guide questions, and repeated ideas were contrasted to ensure each category expressed the participant's viewpoints. Categorization continued until all data were discussed, then the entire research team reviewed the data for agreement. Finally, the entire research team agreed upon the main themes, and individual quotes were utilized to support each of the identified themes. In addition, descriptive statistics on the demographics and food insecurity scores were conducted.

Results

Of the fifteen parents who normally attended the parenting class, nine agreed to participate in the focus group (two males and seven females). The majority of participants were Caucasian/White (71%); non-Hispanic (100%); below the age of 39 years (43%); had a high school education or General Educational Development (GED) (57%); and reported

Low Food Security (57%) based on the 6-item USDA food security short form.³⁴ The food literacy themes identified included the following: (1) Cooking confidence deficit; (2) Healthy meal preparation barriers; (3) Healthy meal acceptance barriers; and (4) Meal planning, management, and adaptability.

Theme 1: Cooking confidence deficit

Several participants indicated they possessed only novice cooking skills, suggesting that meal preparation was a fundamental concern in providing wholesome meals for their families. Some indicated they prepared foods in highly familiar ways and rarely ventured beyond their comfort zone, limiting their ability to expand their meal preparation or try new recipes or ingredients. Many expressed a general sense of anxiety about venturing beyond familiar recipes and a sense of reluctance to experiment with unfamiliar cooking methods (steaming or air fryer) or utilizing different ingredients (fresh broccoli compared to frozen, chopped broccoli).

Participant 2: "I am a brand-new cook. I never really cooked much, so I have zero confidence. And anytime I do make anything, I have tried chicken or pork chops in the oven because that's the easy way. But I want to learn to expand."

Additionally, Participant 2 described how her novice cooking skills limit the meals she prepares for her family. She shared her lack of confidence in knowing when foods are cooked thoroughly or whether they were cooked the "right" way. "Like I said, I'm not a seasoned cook. But I really would like to do fish. However, I'd be the only one

Table 2 Socio-demographic characteristics of parent participants from a community with a high prevalence of food insecurity characteristics parents ($n=7$; 2 missing data)

Age (range in years)	
0–39	3 (43%)
40–49	1 (14%)
50–59	2 (29%)
60 and over	1 (14%)
Gender	
Male	1 (14%)
Female	6 (86%)
Education Level	
Less than a high-school degree	0
High school degree or GED	4 (57%)
Technical or vocational school or trade certificate	0
Some college, but have not graduated	1 (14%)
Two-year or four-year college degree	2 (29%)
Household (persons living in the home)	
0–4	4 (57%)
5–9	2 (29%)
10 or more	1 (14%)
Child 0–5 (living in household)	
1–2	1 (14%)
3–5 or more	1 (14%)
None	5 (71%)
Child 6–17 (living in household)	
1–2	2 (29%)
3–5 or more	2 (29%)
None	3 (42%)
Pregnant	
Yes	1 (14%)
No	6 (86%)
Federal food assistance program participation (check all that apply)	
Food pantry	5 (71%)
Free or reduced school breakfast	1 (14%)
Free or reduced school lunch	2 (29%)
Free or reduced school supper	0
Free summer meals	0
Head Start	0
Medicaid	5 (71%)
SNAP	5 (71%)
WIC	3 (43%)
None reported	0
Hispanic/Latino	
Yes	0
No	7 (100%)
Race/ethnicity	
Black/African American	2 (29%)
White	5 (71%)
Other	0
Household food security status	
High or marginal food security	1 (14%)

Table 2 (continued)

Low food security	4 (57%)
Very low food security	2 (29%)

in my household cooking fish and eating it pretty much. So that's pretty scary because I'm like what do I do? How do I cook it?" And "Even when I do cook, I'm scared that it's not done the way it should be."

Others expressed apprehension about using less familiar versions of foods (frozen vs. fresh), and found it difficult to adapt or alter preparation methods.

Participant 3: "I don't use the broccoli. I don't know what they call it. But they had a big [head of broccoli]— I don't cook those big broccoli. I cook frozen broccoli."

Participant 2: "How to incorporate more vegetables and doing them not in the same old way. I eat a lot of canned vegetables, and it gets boring because it's done the same way."

When Participant 2 was then asked if she was willing to explore fresh, frozen, and canned vegetable preparation methods, her response was "I don't like fresh vegetables," which suggests she likes sticking with known ingredients, or possibly she just prefers the taste of canned foods. Despite the desire to learn new cooking strategies, participants continue to use and eat ingredients they know they like and are comfortable with preparing.

Theme 2: Healthy meal preparation barriers

Participants explained obstacles that limited healthy meal preparation. They shared common barriers such as lack of time, lack of motivation, busy schedules, and bulk cooking, and these obstacles hindered their desire to spend additional time learning recipes and preparing healthier meals.

Participant 7: "Time. I like to cook something, let's get it done. I don't want to be standing in the kitchen for an hour."

Participant 6: "Some people are lazy to cook. I'm lazy."

Another participant shared her concern with recipes. She indicated that while recipe cards may help some families, this strategy was not helpful for her. As indicated, she was a novice cook, so merely handing her a recipe card with step-by-step instructions was useless to her. She lacked confidence in following the instructions appropriately or knowing whether the recipe was progressing as intended. Her lack of confidence in cooking basics such as understanding recipe

measurements or cooking terms like dice, sauté, or broil, made the instructions hard to follow. Participant 2: “Well, I think also what hinders me is I am a visual person, so just having a recipe in front of me makes it difficult because that doesn’t really tell me, okay, at this stage it should look like this—or anything like that.”

Theme 3: Healthy meal acceptance barriers

Several participants shared that improving the nutritional quality of family meals was met with resistance from family members, especially children, who refused to eat healthy foods or taste new recipes. Barriers to increasing meal variety included not knowing how to incorporate or access to new or healthier ingredients, in addition to relying on familiar and expected family menus that are known to satisfy multiple flavor palettes regardless of nutrition profile.

Participant 7: “The biggest problem with healthy eating is if you got kids. They don’t like bland healthy stuff. So, you can put it in front of their face, but they won’t eat it. They want something that’s not healthy. So, you can’t force it down their throats.”

Participant 2: “It’s also really hard when you have people in the house who don’t like the same things. That’s very, very difficult, especially when one person might like stuff plain and some might like it a little differently. So, it makes it hard.”

Participant 3: “[My Daughter], she’s the youngest. She’s six [years old]. The next one is 22 [years old]. [Then there’s] 22, 21, 19, then a 14, 13, and a 12 year-old, then a 6-year-old. And they’re all picky.”

Participant 4: “See, I have a small family. I can get him [my son] to eat salads but—then he won’t try new things. Getting him to try it is the toughest thing.”

Theme 4: Meal planning, management, and adaptability

Participants were asked what strategies might help improve their confidence and expand upon their cooking skills, and they shared several ideas. Strategies involved learning how to stack ingredients by learning several recipes that included an ingredient they were comfortable preparing and expanding their cooking skills based on that one food item. Other ideas included bulk cooking, “cooking once and eating twice” concepts, and menu planning.

Participant 4: “Well, I was thinking more like say you cook a bunch of chicken, then you could use it in different ways. So different recipes that use one pre-cooked thing.”

Participant 6: “I’m always busy. I’m a busy woman. But, on the weekends, I cook a lot of food. Then I put it inside the freezer. Then when you want to eat, you go to the freezer and warm it and eat it.”

Participant 8: “[Recipes] that last two or three days.”

Additionally, another participant indicated that he was eager to consider learning new methods of efficient meal planning, but still might be slightly resistant to some changes. His response was, “It might be helpful, but it doesn’t mean I am going to do it.”

As part of the focus group, participants discussed their weekly meal planning methods and shopping strategies. They expressed frustration with meal planning challenges since they are often at the mercy of what is available or freshest at the food pantry and how much money they have to spend at the grocery store. Food pantries may have variations and inconsistencies in food supplies each week, a continuous barrier for families when it comes to food access and acquisition. Therefore, despite best intentions to plan out meals or recipes in advance, budget constraints and limited food choices from a food pantry often result in last minute menu changes or resorting to cooking a familiar meal with limited ingredients.

Participant 2: “Personally, I do use the food pantry sometimes. So sometimes it depends on what’s available. And then you have to use your resources of what’s available.” Participant 1: “Sometimes it what’s on sale.”

Participant 4: “If it looks fresh too. A lot of times, depending on when you go to the market, what looks better.”

Participant 5: “Sometimes some of the meats or the chicken doesn’t look terrific.”

Participants shared how they responded when desired food items were not available or quality was deemed inferior. There was general agreement that when an item was unavailable, they simply resorted to a backup plan or decided to make an alternative meal instead. However, when asked whether not getting that ingredient was upsetting, most agreed it was a common occurrence, and they have learned to temper frustrations, modify expectations, and quickly adapt.

Participant 2: “I think that also depends on certain situations, like some people might have transportation, and some people may not. So me, I do have a car, and I live close to a couple different grocery stores. So I’m like, okay, they don’t have it. I’ll go to another grocery store, or I’ll go to another grocery store in a couple days when I need it.”

Participant 4: “I just look for something else.”

Participant 9: “Change the plan.”

The unpredictable access to ingredients and spontaneous changes in meal planning may disrupt consistent and healthy menus for family meals. Some parents have access and financial means to purchase ingredients from grocery stores when they are not available at the FP whereas otherwise may simply be at the mercy of what items are accessible that week. These changing circumstances highlight the need for flexible meal planning skills that focus on being proactive rather than reactive in addressing contingency plans.

Discussion

Results from this study support and expand previous research on barriers to nutrition education needs and healthy meal planning in underserved and economically disadvantaged families. The qualitative data analysis identified four distinct themes parents identified as challenges to creating a home environment supportive of healthful behaviors: cooking confidence deficit, healthy meal preparation barriers, healthy meal acceptance barriers, and meal planning, management, and adaptability limitations. Other barriers described have also been reported in the literature, such as lack of time, schedule conflicts, low desire to cook, and lack of confidence in meal preparation or following a new recipe [12, 27]. These barriers all point to a pronounced gap in the concept of food literacy, an umbrella term with varying definitions, influential factors, and determinants; however, broadly describes the ability to make healthy food choices in different contexts, settings, and situations [28–30]. It has become a widely researched topic that recognizes the interrelationship between food, health, and the environment while emphasizing resilience and confidence in navigating one's own surrounding food conditions [31, 32]. Studies suggest that nutrition education programs focused on strengthening food literacy knowledge, behaviors and skills can contribute to and improve health over time [31, 33–36].

Our findings support the literature that limited food literacy impairs parents' ability to meet personal and familial nutrition needs. According to Vidgen and Gallegos and Vaitkeviciute et al., food literacy is a concept described as everyday practicalities associated with healthy eating such as food knowledge and skills and can be broken down into four domains: 1) Planning and management; 2) Selection; 3) Preparation and 4) Eating [31, 37]. Individuals suffering from social inequalities like low socioeconomic status are more likely to exhibit poor food literacy, and our research also demonstrates gaps in all four food literacy domains [38]. Participants shared their desire to learn necessary food literacy skills such as incorporating healthier meals for their families but felt limited by their lack of basic food and cooking knowledge, confidence in safe cooking methods and techniques, limited food access, resistance by

family members to try new foods, and hesitancy to experiment with new preparation methods. Participants expressed anxiety over trying new ingredients or recipes and were ill-equipped to make food decisions based on health and taste. Planning meals for different palates and ages was also a barrier, and no clear strategy for stretching food budgets was identified. Confidence in food preparation skills has been shown in other studies to improve diet quality and long-term health behaviors; however, with persistent limitations in this domain, shortcomings can negatively impact family meal patterns [39, 40]. Individuals who lack cooking skills may rely heavily on convenience or pre-packaged and prepared foods [41, 42]. Compounding this effect, relying on convenient, cheaper, and easier to prepare foods may further reduce motivation to improve upon or develop cooking skills and inherently cause cooking confidence to wither further [43].

The additional value of this research are the lessons learned and the interpretation of how best to utilize the information gleaned to inform current and future nutrition education programming.

Lesson 1: *To increase the likelihood of success, interventions addressing food literacy in parents living with food insecurity should consider aspects of all four domains during nutrition education program planning.* While it is common to focus primarily on the Preparation domain, our focus group findings demonstrate that the other domains are equally important and should be addressed. Food literacy, food insecurity, and healthy eating are interrelated in that lacking skills to navigate the food system to ensure a food intake consistent with nutrition recommendations may contribute to food insecurity, and being food insecure may limit the ability of someone to maintain a healthful diet [38, 44]. Whereas food literacy can improve with nutrition education and skill-based practice, the authors recognize that overcoming food insecurity is a multifaceted societal challenge requiring widespread systemic changes that address underlying causes rooted in poverty [45]. Understanding how to prepare meals using healthier ingredients or mastering food shopping strategies will have limited effectiveness when individuals consistently face economic challenges affecting food security. Nutrition education programs and interventions that tackle food insecurity and food literacy together and focus on the barriers and enablers of both are having a promising impact on food utilization skills but the structural, environmental, and economic limitations preventing food security remain [46–48]. While further exploration is warranted, our results, combined with previous research, support the necessity to create and deliver nutrition education programs aimed at improving food literacy in food-insecure populations. These programs can promote greater autonomy in healthy food preparation and strengthen flexibility in food choices while simultaneously acknowledging and addressing the upstream determinants impacting food security [13, 31, 38].

Lesson 2: *The important nutrition education planning step of assessing participants' food literacy competencies prior to implementation to assure lessons are learner-centered and content is tailored to the identified food knowledge, practice, and skill gaps.* Programs that shape interventions based on participants' food literacy in relation to everyday cooking, nutrition, and learning competencies may better meet the needs of those served and are real targetable outcomes for nutrition education programming [45]. It is also essential to understand that food literacy goes beyond the individual. It is a concept that requires the accumulation of knowledge from both the individual and community and an understanding of the environmental and societal barriers, to fully understand the multifaceted relationship between people and their food system [49]. A variety of validated and reliable tools measuring food literacy are available and should be incorporated as a component of program planning to document intervention efficacy [50]. Addressing gaps in food preparation skills alone, however, may fall short of fully addressing concerns of families experiencing food insecurity and other socioeconomic and psychosocial challenges. Therefore, it is essential to have a baseline of food literacy knowledge and skill to inform how best to address the four domains of food literacy in food literacy program planning (Planning, Selection, Preparation and Eating) to offer the best opportunities for alleviating barriers that may interfere with healthy family meals.

Lesson 3: *The value and meaning of food planning, selection, preparing and eating, and its influence on diet quality must also be understood within the context of socioeconomic status.* The struggle to provide a healthful diet effectively and confidently for oneself and a family when faced with the barriers of food insecurity and low food literacy highlights the need for more community-based programs that foster improved health behaviors and nutrition knowledge of parents who are conduits to their families' health. Socioeconomic disparities impact the entire families' health through less healthful eating patterns and increased morbidity and mortality [51, 52]. To be successful, programs focusing on the family's role in promoting healthy eating must reflect an understanding of the underlying social, cultural, and environmental factors shaping meal preparation, sharing, and consumption [53]. More research is needed to understand and provide strategies to support families who struggle with food insecurity and socioeconomic inequalities in making sustainable changes to healthier eating.

Lesson 4: *Food pantries should be viewed as potential hubs for transforming communities' health.* Given the capacity of a given FP, some FPs, like the one where this research was conducted, have an opportunity to combine hunger relief efforts with nutrition education for low-income individuals and families. However, FPs require resources and community engagement if its role in supporting healthy, food-secure

communities through such programs as food literacy education is to be achieved.

Strengths and limitations

The authors acknowledge several limitations to this study. First, participants were recruited from a parenting class within CSS, which may indicate they were more motivated to improve family life and embrace nutrition and healthy eating than other parents in community settings. Next, the parents who participated in this focus group were recruited from a preexisting parenting class; therefore, it was a non-random sample of participants who frequented the same FP in one metropolitan area. The one focus group with nine participants limited the total range of gathered experiences and generalizability of findings.

Future directions

Real choice and power over one's health require knowledge and skills in relation to food and nutrition, and access to affordable healthy food. Tailoring parent-focused nutrition education programming is crucial for meeting the unique needs of families living with food insecurity and should be a primary consideration when developing programming to engage these families and promote a healthier home food environment. Acknowledging the interdependent nature of the attributes of food literacy, the complexities of food insecurity and poverty, and appreciating the decision-making process behind dietary behaviors is paramount to program success [32]. While not addressed in this paper, the authors also recognize the importance of creating programming that addresses food literacy viewed through a lens of cultural competency and diversity. Programs that tailor nutrition education based on its community's values, traditions, and practices associated with food and nutrition will profoundly resonate with its audience. Integrating culturally relevant information delivered by, for example, trained peer mentors who are representatives of the community they serve, could create an accessible learning environment that could strengthen participants' commitment and information and skill retainment.

This study highlights the necessity to explore the relationship between food literacy and food security prior to program and curriculum design and implementation to address the community's immediate needs and in order to assess whether a program is successful at improving food security and food literacy skills such as self-efficacy. In addition, further development and evaluation of population-specific comprehensive food literacy programs for parents, caregivers, and families can potentially promote health at the larger and broader community level.

Author contribution Conceptualization (TO, RS, LD, AM); Data curation (TO, RS, LD, AM); Formal analysis (TO, RS); Funding acquisition (TO, AM); Investigation (TO, RS, LD, AM); Methodology (TO, RS, LD, AM); Project administration (TO); Resources (TO, RS, LD); Supervision (TO); Validation (TO); Visualization (TO, RS, LD); Roles/Writing – original draft (TO, RS); Writing – review & editing (TO, RS, LD, AM). All authors have read and agreed to the published version of the manuscript.

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Data availability The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy.

Declarations

Competing interests The authors declare no competing interests.

Ethics approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This study was approved and deemed exempt by the university's Institutional Review Board under federal regulation 45 46.10 with IRB approval number IRB-FY2019-85.

Consent to participate Informed consent was obtained from all subjects involved in the study.

Consent for publication Written informed consent has been obtained from all participants.

Conflict of interest The authors declared no competing interests.

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