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## Research Note

# School Nutrition Professionals' Experiences with Food Safety and Special Diets in School Meals during the Initial COVID-19 Pandemic

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### ABSTRACT

Federally funded school meals, such as the National School Lunch Program and School Breakfast Program, can help alleviate food insecurity. Meals served as part of these programs are required by law to be modified when medically necessary, such as food allergies and special diets. The coronavirus disease 2019 (COVID-19) pandemic caused many schools across the United States to close, but schools quickly modified meal-serving models. The purpose of this study was to understand the experiences of school nutrition professionals relative to food safety and providing special diets through modified serving models. A survey was distributed to a convenience sample of child nutrition professionals via social media recruitment and e-mails ( $n = 504$ ). The survey had both closed-ended questions and one open-ended question exploring food safety and special diet accommodations. At the time of the survey, most respondents (68.3%) had been involved in COVID-19 emergency feeding for 3 to 4 weeks. Results indicated that although most child nutrition professionals did not find food safety easier or more difficult during the initial onset of COVID-19, 34.8% of respondents were not taking food temperatures for hot and cold meals during meal service and were not able to obtain (or did not have enough) equipment necessary for holding hot foods (53.0%). Most respondents (60.2%) also indicated that they were not accommodating children with special diets. Themes from the qualitative analysis indicated participants had challenges obtaining specialty items, had little time to make accommodations, or had a limited supply from vendors to accommodate these diets. To prevent food insecurity and to maintain health during the pandemic, specific solutions for at-risk populations, such as those who experience food allergies, must be considered.

### HIGHLIGHTS

- COVID-19 changed school meal distribution in the early onset of the pandemic.
- During emergencies, modified serving models can address food safety concerns and special diets.
- School nutrition professionals were struggling to accommodate special diets.
- Specific solutions for populations needing special diets should be considered.

Key words: COVID-19; Food safety; School nutrition; Special diets

In 2019, 2.4 million U.S. households (6.5% of households nationwide) experienced food insecurity, meaning they were sometimes unable to provide adequate nutritious food to their children (29). Children from food-insecure households are more likely to experience increased rates of asthma and depressive symptoms and are more likely to forgo or delay health care and use the emergency department (23). The National School Lunch Program (NSLP) and School Breakfast Program (SBP) address food insecurity by serving meals; in 2018, more than 4.8 billion lunches and 2.4 billion breakfasts were provided to children across the country (27, 28). The NSLP and SBP contribute significantly to diets of children; those who participate in

both receive about half of their daily calories through these programs (13).

The Office of Food Safety within the U.S. Department of Agriculture (USDA) operates to protect those receiving SBP and NSLP meals from developing foodborne illnesses (31). Between 1973 and 1997, state and local health departments reported more than 600 foodborne diseases, primarily through improper food storage, holding temperatures, and food contaminated by a food handler (5). Venuto et al. (32) indicated that school foodborne outbreaks account for less than 4% of all outbreaks and 8% of illnesses reported to the Centers for Disease Control and Prevention. Although foodborne illness at school is small compared with other settings, it remains important for child nutrition professionals to adhere to proper food safety principles, particularly because more than half of foodborne

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illness in schools is associated with food service worker practices (32).

One aspect of food safety includes allergy management. Allergies that are life threatening are protected by The Rehabilitation Act of 1973 and Americans with Disabilities Act (30). To comply with these laws, school food service staff are required to substitute or modify food for children with disabilities and are encouraged to do so for children without a disability, but with medically certified dietary needs (30). Researchers estimate that childhood food allergy prevalence in the United States is 7.6% (10). Milk, eggs, fish, crustacean shellfish, tree nuts, peanuts, wheat, and soybean account for 90% of allergic reactions in children in schools and preschools in the United States (16). In one study conducted at the Johns Hopkins Pediatric Allergy Clinic in Baltimore, MD, 18% of children experienced an allergic food reaction while at school (16). Schools providing NSLP meals to children with food allergies are responsible for ensuring products are nonallergenic or have an adaptable alternative (30). As part of their Food Safe Schools Action Guide, the USDA recommends school districts educate staff, parents, and teachers about food allergies and how to prevent exposure and respond to children who experience an allergic reaction (26). As a result of the 2011 U.S. Food and Drug Administration Food Safety Modernization Act, the Centers for Disease Control and Prevention published the Voluntary Guidelines for Managing Food Allergies in Schools and Early Care and Education Programs (3). Some of the guidelines for nutrition staff included reading and reviewing children's emergency care plans, gathering dietary orders and necessary medical information, documenting meal substitutions while ensuring compliance with USDA child nutrition program standards, and following policies to avoid cross-contact of allergens during food preparation and service (3). Beyond food allergies, special dietary accommodations are needed for various conditions such as celiac disease (ca. 1 in 133 people in the United States has celiac disease) (24), swallowing problems (0.9% of children 3 to 17 years old) (1), and phenylketonuria (PKU; amino acid buildup in the body; ca. 1 in 15,000 in the United States) (22).

In March 2020, many schools closed across the country in response to the coronavirus disease 2019 (COVID-19) pandemic and as a result, by mid-March, an estimated 196.6 million breakfasts and lunches were provided to children (12). Compared with March 2020, April 2020 food insecurity rates tripled for households with children (20). To address this increase, the USDA initially issued waivers between 20 March and 1 May 2020 to provide schools with the flexibility in where and how they could serve school meals (12). Schools responded by serving grab-and-go meals, delivering meals through school bus routes, and providing meals in other innovative ways (17). Because waivers were offered, each school and/or district provided meals that suited the needs of the children in their area. Patten et al. (17) identified that the majority of child nutrition professionals in their study indicated that curbside pickup at schools was the most common way of distributing meals during the pandemic (62.5%), but delivery along bus

routes (32.5%), pickup at another designated location (30.1%), and home delivery (25.2%) also were distribution methods used. In a qualitative study examining experiences of child nutrition professionals during the COVID-19 pandemic, participants indicated that they had little time to adjust to emergency feeding (18). Alternative serving models to adjust for COVID-19 may have presented new food safety challenges for child nutrition professionals, including serving children with special dietary needs. For example, bus delivery or home delivery services may affect the food safety (e.g., keeping hot foods hot or cold foods cold) or special dietary needs for specific students. Thus, the purpose of this study was to understand the experiences of school nutrition professionals relative to food safety, including accommodating special dietary needs during the initial COVID-19 response.

## MATERIALS AND METHODS

**Survey instrument.** A survey instrument (55 items) was developed to better understand the experiences of school nutrition professionals during the onset of the COVID-19 pandemic. Data from a different aspect of the study have been previously published (17). Respondents reviewed an informed consent statement and indicated their willingness to participate in the study. Adaptive questioning was used to present respondents with relevant items and to reduce survey burden. This article addresses the open- and closed-ended items that queried food safety practices and school nutrition professionals' experiences with accommodating special dietary needs during the pandemic. Questions asked are listed in Table 1. The open-ended item "What has been your experience with these special dietary meal accommodations during this emergent situation?" was presented to only those who had previously indicated they were "providing meals to children with special dietary needs (e.g., food allergies, celiac disease, PKU, dysphagia, etc.)." Before deployment, the instrument was expert reviewed for content and functionality. Institutional Review Board (E2020-140) approval was granted before data collection from Brigham Young University.

**Data collection.** Data were collected from 31 March to 20 April 2020 via Qualtrics. School nutrition professionals involved in school meal distribution from kindergarten through 12th grade were the target population. Direct e-mail invitations to participate were sent to all child nutrition program state directors ( $N=53$ , two e-mails were undeliverable; Arizona had two e-mail addresses listed and Washington, DC, and Puerto Rico also were included). In addition, the access to the survey was made available as a sharable link and QR code on several Facebook groups whose target audience is school nutrition professionals ("Tips for School Meals That Rock" [13,779 followers], "Build Up Dietitians – School Nutrition" [528 followers], and the Institute of Child Nutrition's account [3,945 followers]). Because of the unique pandemic circumstances, convenience sampling was used as a rapid and direct way to access this population and has been used for recruitment in other research about the coronavirus pandemic (16).

**Data analysis.** Descriptive statistics were calculated using SAS 9.4 (SAS Institute Inc., Cary, NC). Responses ( $n=105$ ) to the open-ended question were analyzed using an inductive qualitative thematic approach (2). Two researchers immersed themselves in the data, took personal notes about trends, and met

TABLE 1. *Survey questions asked to child nutrition professionals relative to food safety and special diets during the initial COVID-19 pandemic*

| Question  | Response option  |
|---|--|
| 1. What type of meals are you currently serving? (Check all that apply)   | Hot meals only<br>Cold meals only<br>Combination of hot and cold meals<br>Room temp or shelf-stable meals (i.e., foods that don't need to be kept hot or cold)<br>Meals with frozen components (e.g., frozen sandwiches or juice packs)<br>Other |
| 2. When are meals typically being prepared in your current circumstance?  | The day of distribution to recipient<br>1 day before distribution to recipient<br>2 days before distribution to recipient<br>Other   |
| 3. Are you providing food safety instructions to recipients with meals at the time of service or distribution?  | No (not necessary)<br>No (due to lack of time/resources)<br>Yes (verbal instructions)<br>Yes (written instructions on a handout)<br>Yes (written instructions affixed to food item)<br>Other   |
| 4. In the current emergency circumstances, how long are meals typically at ambient temp between preparation and distribution to the recipient?                                | Less than 1 h<br>1–2 h<br>2–3 h<br>3–4 h<br>4–5 h<br>More than 5 h   |
| 5. Are food temps taken of hot and cold foods throughout the service or distribution period?  | Yes<br>No  |
| 6. Do you have the equipment you need to keep hot foods hot during transportation or service?   | Yes<br>Some, but not enough<br>No<br>Not applicable  |
| 7. Do you have the equipment you need to keep cold foods cold during transportation or service?   | Yes<br>Some, but not enough<br>No<br>Not applicable  |
| 8. What hygiene resources, if any, are currently available at the point of meal service or distribution for employees and volunteers? (Check all that apply)                  | Permanent hand washing station<br>Temporary hand washing station<br>Single-use gloves<br>Hand sanitizer<br>Single-use aprons<br>Reusable aprons<br>Face masks<br>Sanitizing solution<br>Sanitizing wipes<br>Other                                |
| 9. Are you currently providing meals to children with special dietary needs (e.g., food allergies, celiac disease, PKU, dysphagia)?   | Yes<br>No  |
| 10. What has been your experience with these special dietary meal accommodations during this emergent situation? (only shown for participants who responded “yes” to item 10) | (Open-ended response)  |
| 11. Compared with a typical, nonemergency condition, how would you rate your ease or difficulty of ensuring food safety during the COVID-19 response?                         | Much easier<br>Somewhat easier<br>Neither easier nor more difficult<br>Somewhat more difficult<br>Much more difficult  |
| 12. Compared with a typical, nonemergency condition, how would you rate your ease or difficulty of accessing needed equipment during the COVID-19 response?                   | Much easier<br>Somewhat easier<br>Neither easier nor more difficult<br>Somewhat more difficult<br>Much more difficult  |
| 13. Is your school or district receiving new equipment to provide meals during the emergent situation?  | (Check box)  |

through videoconference to develop a codebook that described the response types that fell into each theme. They independently coded the data (14) line by line, manually in Word (Microsoft, Redmond, WA), and intercoder percent agreement was 83%. The disagreements in coding were discussed by researchers, and a final coded document was created.

## RESULTS

Surveys were derived from the QR code ( $n = 5$ ), invitation over e-mail ( $n = 17$ ), and primarily via the anonymous shareable link ( $n = 510$ ). There were 513 total participants from all states except Alaska, Delaware, and Hawaii (Washington, DC, was not represented; Table 1). Respondents included 14 state agency directors (2.7%) and 9 state agency personnel (1.8%), 220 school district-level nutrition program directors (42.9%), 108 school-level nutrition program managers (21.0%), 34 school-level nutrition program supervisors (6.6%), and 89 front-line staff members (15.8%). There were 47 participants in “other” roles (9.1%), including dietitians, consultants, menu managers, and bookkeepers and clerks who contributed in various ways to the emergency feeding response.

Most respondents (68.3%) reported involvement in emergency feeding for 3 to 4 weeks before the study was conducted (Table 2). Only two respondents had been participating in emergency feeding for less than a week. Some respondents ( $n = 10$ ) indicated they were not currently working in the emergency feeding response due to personal or other at-risk statuses, school closure or sent home, or feeling stressed or unsafe. Some respondents ( $n = 6$ ) were not currently working because their school or district was not providing meal service during the pandemic (data not shown).

First, food safety practices were examined. About half of respondents (47.7%) indicated that ensuring food safety was neither easier nor more difficult during the emergency response, and 43.4% found accessing needed equipment neither easier nor more difficult. Yet, 60.9% of respondents indicated they did not have enough equipment to keep hot foods hot during transportation or service, and 53% indicated they did not have enough equipment for keeping cold foods cold during transportation or service. Only four respondents (0.8%) received assistance in the form of equipment (Table 2).

About half (48.2%) of participants were preparing meals at least 1 day before distribution. All participants reported that meals were left at ambient temperatures for 4 h or less. Approximately one-third (34.8%) were not taking food temperatures for hot and cold foods during service. Although 63.0% of respondents reported providing some form of food safety instructions for food consumed off-campus, there were 26% who did not provide instructions because they did not view them as necessary and 8% who did not provide instructions due to lack of resources. Although 46.2% of respondents provided food safety instructions through a written handout, 5% of total respondents provided these instructions verbally, which may not be as effective as written instructions. A variety of hygiene resources were being used: 22.4% were using

single-use gloves, 16.2% had hand sanitizer, and another 10% were using face masks (Table 2).

The majority of respondents (60.2%) indicated they were not accommodating children with special dietary needs (e.g., food allergies, celiac disease, dysphagia) during emergency feeding (Table 2). Respondents who were accommodating special dietary needs (37.8%; Table 2) were asked about their meal accommodation experiences through an open-ended question. Four themes emerged from a qualitative thematic analysis of responses ( $n = 105$ ): logistical processes (54.3%), feelings or emotions (50.5%), demand for accommodations (38.1%), and specific types of meal accommodations (23.8%; Table 3).

Many respondents described the logistics of how their school nutrition program was making special dietary accommodations during emergency feeding. Respondents commonly reported marking special meals or keeping them separate from others to avoid confusion during distribution. For example, one participant said “We ask either verbally or with a sign, ‘Any Allergies, Let Us Know.’ The cars with allergens move up and park until special meals are prepared. The car pops their trunks, we place all food items into trunks only.” In some cases, meals were delivered directly to students’ residences. Respondents also reported challenges included having limited supply from vendors, difficulty obtaining special items, or limited time to make accommodations.

One nutrition director expressed her feelings about accommodating for special diets as both “exhausting and rewarding.” Respondents reported their experiences navigating the challenge of varying demand for special accommodations. Yet, another participant indicated that “families are grateful” for special meal accommodations during the pandemic.

Some had the same amount or fewer requests as before the pandemic, although others found forecasting difficult. One nutrition program manager from Minnesota wrote, “[it’s] frustrating when we prepare meals for specific children with special diets and they do not come to pick up their meals.”

Many respondents described which dietary needs were accommodated during this time. Most commonly, nutrition staff reported preparing gluten-free; milk, dairy, or lactose-free; peanut-free; and vegetarian meals. One respondent indicated that they were doing daily carbohydrate counts for a diabetic student, and another said, “we are only focusing on the life-threatening food allergies such as peanuts.”

## DISCUSSION

Before the pandemic, school meals were typically served in the cafeteria in a school during specified times (before school for breakfast and during the school day for lunch). More recently, schools are offering breakfast by using alternative models such as breakfast-in-the-classroom and grab-and-go carts, but typically these programs are phased in and equipment is purchased before implementation (5), thereby potentially mitigating food safety concerns. Occasionally, meals are served as part of field trips and additional food safety precautions need to be taken (21). Yet, because the COVID-19 pandemic disrupted usual meal

TABLE 2. Safety practices and perceptions of school nutrition professionals during the early onset of the COVID-19 pandemic

| Variable  | Frequency (N = 513) <sup>a</sup> |      |
|---|----------------------------------|------|
|   | n                                | %    |
| Duration of providing meals during initial COVID-19 onset   |                                  |      |
| Less than 1 wk  | 2                                | 0.5  |
| 1–2 wk  | 105                              | 27.3 |
| 3–4 wk  | 263                              | 68.3 |
| More than 4 wk  | 15                               | 3.90 |
| Types of meals being served <sup>b</sup>  |                                  |      |
| Hot meals only  | 2                                | 0.3  |
| Cold meals only   | 159                              | 25.7 |
| Room temp or shelf-stable meals   | 144                              | 23.2 |
| Meals with frozen components  | 131                              | 21.1 |
| Combination of hot and cold   | 172                              | 27.7 |
| Other (e.g., meals to heat up, cold and shelf stable)   | 12                               | 1.9  |
| When meals are prepared   |                                  |      |
| Day of distribution   | 168                              | 47.0 |
| 1 day before distribution   | 133                              | 37.2 |
| 2 days before distribution  | 39                               | 10.9 |
| Provision of safety instructions  |                                  |      |
| No (not necessary)  | 93                               | 26.0 |
| No (due to lack of time or resources)   | 30                               | 8.4  |
| Yes (verbal)  | 16                               | 4.5  |
| Yes (written on handout)  | 165                              | 46.2 |
| Yes (written affixed to food)   | 44                               | 12.3 |
| Other (please indicate)   | 9                                | 2.5  |
| Hygiene resources available at the point of meal service or distribution for employees and volunteers? <sup>b</sup> |                                  |      |
| Permanent hand washing station  | 155                              | 10.1 |
| Temporary hand washing station  | 11                               | 0.7  |
| Single-use gloves   | 344                              | 22.3 |
| Hand sanitizer  | 246                              | 16.2 |
| Single-use aprons   | 129                              | 8.4  |
| Reusable aprons   | 121                              | 10.4 |
| Face masks  | 160                              | 7.9  |
| Sanitizing solution   | 210                              | 13.7 |
| Sanitizing wipes  | 152                              | 9.9  |
| Other (e.g., face shields, bleach)  | 8                                | 0.5  |
| Duration meals left at ambient temp   |                                  |      |
| Less than 1 h   | 193                              | 54.5 |
| 1–2 h   | 125                              | 35.3 |
| 2–3 h   | 28                               | 7.9  |
| 3–4 h   | 8                                | 2.3  |
| Food temp taken during service  |                                  |      |
| Yes   | 232                              | 65.2 |
| No  | 124                              | 34.8 |
| Equipment for hot foods obtained  |                                  |      |
| Yes   | 75                               | 39.1 |
| Some, but not enough  | 51                               | 26.5 |
| No  | 66                               | 34.4 |

TABLE 2. Continued

| Variable   | Frequency (N = 513) <sup>a</sup> |      |
|--|----------------------------------|------|
|  | n                                | %    |
| Equipment for cold foods obtained  |                                  |      |
| Yes  | 153                              | 46.9 |
| Some, but not enough   | 130                              | 39.9 |
| No   | 43                               | 13.1 |
| Catering to special dietary needs  |                                  |      |
| Yes  | 140                              | 39.8 |
| No   | 212                              | 60.2 |
| Ensuring food safety during emergency feeding is ...   |                                  |      |
| Much easier  | 9                                | 2.5  |
| Somewhat easier  | 22                               | 6.2  |
| Neither easier nor more difficult  | 170                              | 47.8 |
| Somewhat more difficult  | 99                               | 27.8 |
| Much more difficult  | 51                               | 14.3 |
| Not applicable   | 5                                | 1.4  |
| Accessing needed equipment during emergency feeding is ...   |                                  |      |
| Much easier  | 4                                | 1.1  |
| Somewhat easier  | 11                               | 3.1  |
| Neither easier nor more difficult  | 161                              | 45.3 |
| Somewhat more difficult  | 72                               | 20.3 |
| Much more difficult  | 51                               | 14.4 |
| Not applicable   | 56                               | 15.8 |
| Is your school or district receiving new equipment to provide meals during the emergent situation? |                                  |      |
|  | 4                                | 0.8  |

<sup>a</sup> Responses may not all add up to N due to nonresponse.

<sup>b</sup> Responses may exceed more than N due to multiple options selected.

service, it was important to understand the experiences of child nutrition professionals relative to food safety and special meals. As part of a previously published study conducted in conjunction with the present study, meals were distributed during the early phase of the pandemic through curbside pickup at schools, delivery along bus routes, pickup at another designated location, and home delivery (17). Change in distribution models complicated the ability for child nutrition professionals to accommodate special diets and maintain food safety.

Almost half of the participants indicated that food safety was not a concern during the initial pandemic, but another 43% said ensuring food safety had become more difficult. These challenges may be attributable to the change in delivery models or access to equipment to keep hot foods hot and cold foods cold given changes in transportation or service. Although no research has examined food safety in alternative school delivery models at this magnitude, research from school field trips may give us insight to the challenges that exist. For example, Sneed and Patten (21) discovered that almost 30% of school nutrition managers did not transport food in coolers with ice or ice packs, including food that require time and temperate control for safety. Despite the challenges faced during the pandemic, most

TABLE 3. *Qualitative themes for school meal special diets during the initial onset of the COVID-19 pandemic*

| Brief theme description  | Representative quote(s)   |
|--|---|
| <p>Theme 1. Logistical processes of managing special meals, <math>n = 57</math> (54.3%)</p> <p>Participants discussed their logistical processes for providing special meals during emergency feeding. Some reached out to individual families with students who needed special meals, and others requested the family contact the school. Various methods were used to distribute special meals. Difficulties procuring needed items were reported.</p> | <p>Families call to make requests. Meals are labeled and placed on appropriate bus routes.</p> <p>We reached out to each child we were serving normally with a dietary accommodations form. Asked if needed meals. Have ready at their pick up meal location of preference.</p> <p>Not getting needed food items!</p>   |
| <p>Theme 2. Feelings toward special meals during pandemic, <math>n = 53</math> (50.5%)</p> <p>Throughout responses, participants expressed their feelings toward providing special meals during emergency feeding. Although some reported providing special meals was challenging or frustrating, other reported no change or even satisfaction.</p>   | <p>Difficult, confusing, poor quality.</p> <p>Frustrating.</p> <p>A lot of worry.</p> <p>This is no different than the school year . . .</p> <p>Exhausting and rewarding.</p> <p>Families are grateful.</p>   |
| <p>Theme 3. Demand for special meals, <math>n = 40</math> (38.1%)</p> <p>Some participants noted the decrease in requests for special meals during emergency feeding. Participants noted feeling frustrated when the extra effort to provide special meals was wasted if students or families did not claim their meals. Others noted the demand did not change from</p>   | <p>They say they are coming and don't show so I have a meal I can't use and I have new allergies that parents want meals for. The kids have been at my schools for multiple years without any requests.</p> <p>Not many requests but the same response as in the school year. We provide for these children during the school year so already know their needs.</p> |
| <p>Theme 4. Special dietary needs accommodated, <math>n = 25</math> (23.8%)</p> <p>Participants described the type of special meals their schools were accommodating during emergency feeding. Some only had requests for certain special meals, whereas others limited the types of special meals they could provide.</p>   | <p>Daily carb count for diabetics.</p> <p>Vegetarian and gluten-free options available.</p> <p>We are only focusing on the life-threatening food allergies such as peanut.</p> <p>Mostly requests for lactose-free milk only.</p> <p>We do prepare a limited number of nut and egg free meals.</p>  |

respondents indicated that they were providing food safety instructions, taking food temperatures, and using a variety of hygiene resources (e.g., hand sanitizer, single-use gloves).

Although many respondents from the present study indicated their programs received special assistance such as USDA waivers, grants, and private donations during the pandemic, school nutrition professionals may need to be connected with additional resources to operate fully during emergency situations (25). For example, very few received assistance in the form of equipment and the majority of respondents noted a lack of proper hot and cold holding equipment to serve meals during the pandemic. Providing this equipment would be a relatively basic intervention that could improve the food safety, capacity, and appeal of meal service during the pandemic, but many kitchens were not prepared for a shift in distribution. Equipment grants are or have been available from the USDA (25), No Kid Hungry (15), and GENYouth (7), but it is possible that these grants were not used because of unawareness, effort to apply for the grants, or other reasons.

Providing special diets also proved to be a challenge for child nutrition professionals during the pandemic—60% of respondents were not catering to special dietary needs. Before the pandemic, the Food Allergy Research and

Education organization had urged schools to educate their nutrition staff on food allergies in case of emergencies (6); previous studies have shown that less than half of school nutrition professionals receive allergy training (14). Providing additional training could be a way to ensure that school nutrition professionals are equipped to provide safe food during future emergency circumstances. The funding for resources to keep food—and subsequently children—safe needs consideration, particularly in emergency situations. For example, additional school nutrition safety precautions such as washing hands with soap before and after meals, cleaning surfaces with a detergent before and after meals, avoiding sharing food, stocking unassigned epinephrine, and adopting a zero-tolerance policy for bullying children with food allergies can help provide a safer environment (8). When planning for emergencies, schools also should consider using stickers to identify food containers with allergens (6). Dietary accommodations are necessary for the well-being of children with allergies, celiac disease, PKU, and other nutrition-related conditions. There is evidence that children with celiac disease (11) and PKU have higher food insecurity concerns (4) than the general population. It is unclear to what extent children are not requesting these accommodations or programs are

opting not to accommodate, but this is concerning considering other research has indicated that nearly all schools make accommodations for children with food allergies during nonemergency situations (19).

Two frustrations indicated among school nutrition professionals in the present study included accurately forecasting meal counts for special dietary needs and procuring appropriate foods during the pandemic. Participants agreed or strongly agreed that the specialty foods they purchased were influenced by whether their regular vendor supplied the items needed (80%) and the ease of production for staff (82.5%). This suggests school nutrition programs need increased availability of specialty meal items, such as gluten-free and nut-free foods, to ensure specialty meals are adequately able to be provided at all times. Yet, a previous study indicated that costs for specialty meals increase because of purchasing, planning, communication, and training needed to offer these meals (9). Thus, the need for creating menu cycles created a challenge for many of the participants during the pandemic. Qualitative results from the present study indicated that demand for special meals decreased; this may have occurred because parents may not have realized that these accommodations were being offered. Clear communication between parents and child nutrition professionals regarding special dietary accommodations is needed during a pandemic to ensure dietary needs are met and reduce some of the burden placed on school nutrition professionals during a demanding time as well as mitigate food insecurity among populations that may have higher rates due to specialty needs (4, 11).

Additional research could be dedicated to understanding how school nutrition professionals' preparedness for food safety and special diets changed over time relative to the COVID-19 pandemic. Future research could focus on the development of emergency response plans and training to keep school nutrition professionals up-to-date about considerations for response plans and the effectiveness of trainings. A large body of research has been devoted to disaster management, and this field of study could expand to include school nutrition professionals as stakeholders in disaster management, particularly as key personnel involved in food insecurity mitigation.

**Limitations.** This study has limitations. Because a convenience sample was used, results may not be generalizable to all communities given the differences that exist within school nutrition services, community demographics, and the impact of COVID-19 on communities. In addition, results from the study capture experiences relative to the initial onset of emergency feeding for the COVID-19 pandemic; thus, the results cannot be extrapolated through the entire pandemic experience.

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