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Examining Foods and Beverages Served and Child Food Insecurity across Early Care and Education (ECE) Programs in Communities with High Rates of Obesity and Food Insecurity

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Abstract

The purpose of this study was to examine implementation of serving food and beverage evidence-based practices (nutrition EBPs) across CACFP participating licensed childcare centers (CCCs, $n = 51$) and family childcare homes (FCCHs, $n = 49$) in central California. Results indicated that FCCHs reported significantly higher ($p < .05$) implementation of nutrition EBPs and barriers than CCCs. Both CCCs and FCCHs refer families to WIC/SNAP when they observe child food insecurity and control how much food is served to children. It is important to consider organizational structure (CCCs, FCCHs) and child food insecurity when developing policies/interventions for improving implementation of nutrition EBPs in ECEs.

Keywords: foods and beverages, food insecurity, preschoolers, CACFP, family childcare homes, childcare centers, ECE

Introduction

Childhood obesity and child food insecurity are public health concerns, intersecting in many ways and predisposing millions of low-income children at greater risk for poor health outcomes and other serious health conditions.^{1,2} Food-insecure households have been shown to consume foods high in energy, fat, and sugar and low in nutritional value.³ Nationally, the childhood obesity rate is 13.9% among 2- to 5-year-olds.² In 2018, rates of food insecurity were higher than the national average for households with incomes below 185% of the poverty threshold (29.1%), households with children under age 6 (14.3%), and households with Black, non-Hispanic (21.2%), and Hispanic (16.2%) residents.¹ The COVID-19 pandemic has increased food insecurity rates with current research indicating that approximately 14 million children are food insecure.⁴ Therefore, it is more critical than ever to prioritize children's access to nutritious food.

Given the widespread use of out-of-home child care, Early Care and Education (ECE) programs offer an ideal opportunity in preventing childhood obesity and addressing child food insecurity by implementing food and beverage evidence-based practices (nutrition EBPs).⁵⁻⁸ Nutrition EBPs in ECE are research tested and recommended by national policies to improve children's nutritional quality of foods and beverages served and mealtime practices.^{9,10} Some examples of nutrition EBPs include serving children healthy foods and beverages, such as vegetables, fruits, whole grains, lean proteins, fat-free and low-fat dairy products, prepared with no or little added sugars, saturated fat, and sodium.^{9,10} Food insecurity for young children indicates households at times are unable to get enough food for one or more household members resulting from economic and social conditions⁵ or, in other words, because of insufficient money and other resources for food.¹

Role of ECE in Childhood Obesity Prevention and Addressing Child Food Insecurity

ECE programs can help combat childhood obesity and child food insecurity through federally funded food programs.¹¹ For example, ECE programs can share information about food programs such as the Supplemental Nutrition Assistance Program (SNAP), Women Infant Children (WIC) with parents for which they or their children may qualify.¹¹ In addition, the Child and Adult Care Food Program (CACFP) is a state and federally funded child nutrition program and an important policy strategy to improve young children's diet quality and child food security through which more children can receive nutritious meals and snacks in ECE programs.^{10,12} CACFP reaches more than 4 million children nationally, providing reimbursement to ECE programs for serving nutritious meals and snacks that meets federal nutrition standards.¹² Although in 2017, the national nutrition standards for CACFP were updated and required more whole grains, a wider variety of fruits and vegetables, fewer added sugars, and less saturated fat,¹² there is limited research that explores the implementation of CACFP-updated meal patterns.

ECE programs that participate in CACFP may considerably influence children's health outcomes. For example, CACFP may improve children's dietary quality through

reimbursements for meals, adhering to CACFP nutritional guidelines, and monitoring of menus.¹⁰ Research has shown that CACFP-participating ECE programs served more fruits, vegetables, milk, and meat/meat alternatives, and fewer sweetened beverages than non-CACFP ECE programs.¹³ Furthermore, ECE programs participating in CACFP has also reported consumption of milk and vegetables among children.⁸ CACFP can also improve child food security with access to a regular source of nutritious meals for children from low-income families.^{5,6,14} Given that meals and snacks provide one-third to one-half of the daily nutritional needs of children in part-day and full-day ECE programs,¹⁵ children from low-income families may be particularly dependent on healthy meals and snacks served in ECE.^{5,6,13,16,17} CACFP attempts to ensure that children from low-income families receive at least one nutritious meal and a snack while in ECE programs.⁶ Therefore, the importance of CACFP for improving the nutritious quality of foods and beverages served and addressing child food insecurity in ECE programs underscores the need to examine the implementation and barriers regarding the updated CACFP meal pattern requirements.

When examining nutrition EBPs, in addition to being aware of CACFP eligibility and reimbursement criteria, it is also important to consider organizational structure of the ECE. ECE programs vary in organizational structure and can be broadly categorized as being either childcare centers (CCCs) or family childcare homes (FCCHs). Typically, CCCs serve a larger number of children and employ staff, whereas FCCHs care for fewer children and the owner is often the childcare owner and teacher.¹⁸ Additionally, while the food preparation in CCCs is more commonly catered or prepared by food service personnel, FCCHs more often prepare the food themselves,¹⁹ which may largely influence nutrition EBPs implementation. Furthermore, despite the known benefits of ECEs participation in CACFP,^{6,8,13,14} research-based information is limited regarding nutrition EBPs implementation across ECE programs (CCCs and FCCHs) in central California. Considering that central California is ethnically and economically diverse,²⁰ more research-based information about such practices is needed to develop targeted interventions.

Rationale and Purpose of the Study

A majority of population in central California is Hispanic with a high percentage of children living in poverty.²⁰ Specifically, children living under 100% of the federal poverty level is 38.3% in Tulare County and 29.8% in Kings County compared to 21.9% in California.²⁰ Owing to high rates of poverty, > 40% of CCCs and > 73% of FCCHs in central California are eligible to participate in CACFP as compared to only 31% of CCCs and 52% of FCCHs in the rest of California.²¹ Although in California, CCCs and CACFP participating sites have reported more health-promoting practices than FCCHs and non-CACFP participating sites,¹⁶ relatively not much is known about implementing nutrition EBPs in CACFP participating CCCs and FCCHs in central California where the burden of poverty, childhood obesity, and child food insecurity is higher compared to other counties in the state.²⁰ Therefore, the purpose of this study was to examine implementation, difficulty, and barriers of serving food and beverage evidence-based practices including child food security across CACFP participating licensed CCCs and FCCHs serving 2- to 5-year-old children in two metropolitan counties of central California.

Methods

Study Design

This study is cross-sectional with data collected between March 2018 and June 2018. Prior to the data collection, pilot testing of the questionnaire was conducted with three CCCs and three FCCHs to ensure face validity. After the providers' comments regarding the survey items, no modifications were required. The local Resource & Referral (RR) agency coordinator assisted in the recruitment. Survey packets were mailed to the CCCs and FCCHs. The packet included a cover letter, consent letter, survey, cookbook, and a postage-paid return envelope. Participants were asked to mail the completed survey in the accompanying stamped return envelope. Both English and Spanish paper surveys were distributed. Each survey was identified with an ID number, and no names appeared on the survey. The nonidentifiable data was saved on a password-protected computer of the first author who is also the principal investigator (PI). The PI asked the RR agency coordinator to send three email reminders, one every 10 days during the data-collection period. A waiver of signed informed consent was obtained from the University Institutional Review Board (#1082486-3). Providers also had the option to opt out from the study by not returning the survey. The PI used the services of Communication Services & Information Technology housed in the University campus to help translate the survey from English to Spanish. The University Institutional Review Board approved this study.

Participants

Participants in this study were licensed CCCs ($n = 51$) and FCCHs ($n = 49$) providers located in two metropolitan counties of central California. The sampling frame included licensed CCCs ($n = 182$) and FCCHs ($n = 519$) caring for young children (2–5 years) and serving meals and/or snacks to children. A total of 117 survey questionnaires were returned with a response rate of approximately 17%. In the existing literature, response rates for most surveys similar to this one range from 5% to 20%.²² For the purpose of this study, only CACFP-participating licensed CCCs and FCCHs surveys were included. Seventeen non-CACFP licensed CCCs and FCCHs surveys were excluded from data analysis.

Measure

This study adapted the Healthy Children, Healthy State 86-item paper survey used in the previous published research with ECE providers.⁷ The survey included items to obtain information on characteristics of the program, implementation of serving foods and beverages, difficulty, and barriers, mealtime practices, child food insecurity, nutrition education, engaging parents, and preferences for training. For this study, the researchers mainly used data from implementation of serving foods and beverages (see Table 2), difficulty (see Table 2), barriers (see Table 3), and child food insecurity (see Table 4) sections of the questionnaire drawn from a previous published study⁷ including the child food insecurity questions.^{5,7} The survey questionnaire was distributed to licensed CCCs and FCCHs with instructions that responses should refer only to preschool classrooms serving 2-to-5-year olds.

Statistical Analysis

Descriptive statistics were calculated to determine the percentages, means, and standard deviations of program and participant characteristics. For reporting obesity, providers were asked “How much of a health problem is obesity among children in your program?” Because of a lack of variability, the four possible responses (“Not a problem,” “A small problem,” “A problem,” or “A large problem”) were recoded into “Not a problem” and “A problem.”

For 11 nutrition EBPs, providers were asked “Is your program currently doing this?” and could respond to each with “Yes” or “No.” For the same 11 nutrition EBPs, providers were asked how difficult it is to do. The four possible responses for the implementation difficulty survey such as “Not at all difficult,” “A little difficult,” “Kind of difficult,” or “Very difficult” were recoded into “Difficult” (“A little difficult,” “Kind of difficult,” and “Very difficult”) and “Not Difficult” in order to determine the percentage of childcare providers reporting implementation as “difficult to do” for each best practice. Providers were asked about 13 barriers to providing healthier meals and snacks and could respond to each with “Yes” or “No.”

Providers were then asked how often they see a child who does not appear to be getting enough food to eat at home, what they and their providers do when they see a child who does not appear to be getting enough food to eat at home, and how the program makes sure there is enough food for everyone at meals. Because of a lack of variability in the food insecurity variable, we recoded responses into two options: “Yes” (which includes “Rarely,” “Sometimes,” “Often,” and “Very Often” from the original 5-point scale) and “No” (which includes “Never”). Providers could respond “Yes” or “No” to the five questions on actions taken after seeing the child and the six questions on how the program makes sure to have enough food. Total numbers of nutrition EBPs, difficulties, and barriers were calculated by creating a sum variable from each of the individual questions. Chi-square tests were used to examine differences between CCCs and FCCHs in foods and beverages EBPs and related implementation difficulty, barriers to implementation, and child food security, using an alpha level of $p < .05$. All analyses were conducted using IBM Statistical Package for the Social Sciences (SPSS) version 26.²³

Results

Characteristics of ECE Sites

Table 1 shows the demographic characteristics of the sample. For the current study, only CACFP participating CCCs ($n = 51$) and FCCHs ($n = 49$) were included. Across CCCs and FCCHs, most surveys were completed by the site director or owner. More FCCHs (95.9%) reported onsite meal preparation compared to CCCs (49%). The CCCs provided both full-day (60.8%) and half-day care (33.3%), whereas the FCCHs provided only full-day care. Most CCCs (94%) served a majority of Hispanic/Latino children compared to FCCHs (84%). More CCCs (74.5%) than FCCHs (51%) reported obesity as a health problem among children in their program, and more FCCHs (54.3%) than CCCs (40%) reported child food insecurity (seeing a child who does not appear to be getting enough food to eat at home).

Table 1. Program and participant characteristics of CCCs and FCCHs participating in CACFP ($N = 100$)

	CCC ($n = 51$) Mean (SD) or %	FCCH ($n = 49$) Mean (SD) or %
PROGRAM CHARACTERISTICS		
Average Number of Children by Age	47.80 (61.30)	10.50 (4.26)
0–23 months	10.50 (6.35)	1.97 (.90)
24–35 months	15.14 (9.35)	2.97 (1.56)
3–5 years	43.91 (60.60)	4.37 (3.61)
Older than 5 years	137 (170.48)	4.22 (.41)
Average Number of Children by Racial Background		
American Indian or Alaskan Native	.55 (1.67)	.02 (.14)
Asian	2.37 (2.06)	1.40 (.55)
Black or African American	3.71 (4.63)	2.43 (1.51)
Native Hawaiian or Pacific Islander	3.50 (3.54)	1 (—)
White or Caucasian	11.51 (16.42)	6.34 (4.90)
Mixed Race	15.65 (28.02)	5 (3.76)
Other	6.25 (7.37)	1 (—)
Serves Hispanic/Latino children	94	84
Average Number of Providers Employed	7.38 (6)	2.50 (2.06)
Program Schedule		
Half-day	33.3	—
Full-day	60.8	100
Food Prepared Onsite		
Yes	49	95.9
No	51	2
Responsible for Menu Planning		
Owner of childcare program	3.9	40.8
Director or site supervisor/manager	39.2	2
Family childcare provider	—	65.3
Cook or chef	27.5	—
Catering company	—	—
Dietitian	13.7	—
Parent/guardians provide food for their children	—	—
Program Participation		
Child and Adult Care Food Program by USDA (CACFP)	100	100
Go NAP SACC Participation	29.4	2
QRIS	64.7	10.2
National Association for the Education of Young Children (NAEYC)	58.8	4.1

Table 1. Continued		
	CCC (<i>n</i> = 51) Mean (SD) or %	FCCH (<i>n</i> = 49) Mean (SD) or %
Meals Provided in the Program		
Breakfast	68.6	98
Lunch	70.6	100
Dinner	—	73.5
Mid-morning snack	25.5	69.4
Mid-afternoon snack	72.5	95.9
Evening snack	9.8	32.7
Obesity as Problem in Program		
Yes	74.5	51
No	25.5	49
PARTICIPANT CHARACTERISTICS		
Years working in early childhood field	16.30 (10.64)	16.73 (10.01)
Age	46.13 (11.82)	48.65 (13.04)
Gender		
Female	100	100
Male	0	0
Ethnicity		
Hispanic/Latino	43.1	67.3
Non-Hispanic/Latino	51	32.7
Racial Background		
American Indian or Alaskan Native	1.7	1.7
Asian	1.7	1.7
Black or African American	5.1	3.4
Native Hawaiian or Pacific Islander	0	1.7
White or Caucasian	74.6	63.8
Mixed Race	1.7	3.4
Other	—	1.7
Highest degree completed		
Less than high school	—	4.1
Some high school	—	16.3
High school graduate or GED	2	14.3
Some college	9.8	40.8
2-year degree	41.2	12.2
4-year degree	29.4	8.2
Graduate or professional degree	17.6	4.1

Implementation of Foods and Beverages and Difficulty across CCCs and FCCHs

Table 2 shows implementation of serving foods and beverages between CCCs and FCCHs. The CCCs and FCCHs reported implementing similar nutrition EBPs related to serving healthy foods and beverages. Overall, FCCHs reported high implementation of nutrition EBPs than CCCs such as: serve fruits more than one time a day ($\chi^2(1, N = 89) = 10.47, p =$

.001), serve vegetables more than one time a day ($\chi^2(1, N = 90) = 10.68, p = .001$), serve only unflavored skim (nonfat) or 1% milk ($\chi^2(1, N = 79) = 7.77, p = .005$), serve high-fiber, whole-grain foods 1+ times a day ($\chi^2(1, N = 93) = 6.01, p = .01$), prepare cooked vegetables without fat or butter ($X^2(1, N = 87) = 10.20, p = .001$), serve only lean or low-fat meat ($\chi^2(1, N = 85) = 5.94, p = .02$), serve fried or prefried meats less than one time a week ($\chi^2(1, N = 55) = 5.92, p = .02$). Additionally, both CCCs and FCCHs reported less than optimal implementation (< 40%) of the following nutrition EBPs: serving high-sugar/high-fat foods less than one time per week or never and never serving sugary drinks. Interestingly, the low levels of implementation contrast with no reported difficulty levels. The CCCs and FCCHs did not report high actual or perceived implementation difficulty for any of the nutrition EBPs.

Table 2. Percentage and differences in serving foods and beverages and difficulty across CCCs and FCCHs (N = 100)

	Implementation of Best Practices "Yes"					Total (n = 100) %	Implementation Difficulty "Difficult to do"					Total (n = 100) %
	CCC (n = 51) %	FCCH (n = 49) %	χ^2	df	p		CCC (n = 51) %	FCCH (n = 49) %	χ^2	df	p	
Serve fruit 1+ time/day	80.4	100	10.47	1	< .001	89	6.7	9.3	.21	1	.65	7
Serve vegetables 1+ time/day	80.4	100	10.68	1	< .001	90	6.8	11.1	.46	1	.50	7
Serve skim or 1% milk	88	95.8	2.00	1	.16	90	6.7	8.6	.10	1	.75	6
Serve only unflavored skim (nonfat) or 1% milk	72.3	93.8	7.77	1	.005	79	7.1	8.6	.05	1	.82	6
Serve high fiber, wholegrain foods 1+ time/day	88.2	100	6.01	1	.01	93	11.4	16.2	.40	1	.53	11
Prepare cooked vegetables without fat or butter	76.5	98	10.20	1	< .001	87	15.9	8.3	1.04	1	.31	10
Serve only lean or low-fat meat	76.5	93.9	5.94	1	.02	85	22.7	16.2	.54	1	.46	16
Serve fried or prefried meats < 1 time/week	43.1	67.3	5.92	1	.02	55	15.9	9.3	.86	1	.35	11
Serve high sugar/ high fat foods < 1 time/week	37.3	34.7	.07	1	.79	36	9.3	16.2	.87	1	.35	10
Never serve sugary drinks	56	44.9	1.22	1	.27	50	9.1	13.5	.40	1	.53	9
Use either healthy foods or nonfood treats to celebrate	72	87.5	3.62	1	.06	78	16.7	15.8	.01	1	.92	13

Table 2. *Continued*

Total healthful practices (sum)	Mean (SD)	Mean (SD)	<i>T</i>	<i>df</i>	<i>p</i>	Mean (SD)	Mean (SD)	Mean (SD)	<i>T</i>	<i>df</i>	<i>p</i>	Mean (SD)
	7.61 (2.87)	9.06 (1.45)	3.21	75	.002	8.32 (2.39)	1.17 (2.38)	1.11 (2.67)	.11	91	.92	1.14 (2.51)

Note: Chi-square analysis using 2 × 2 contingency table

Barriers to Serving Foods and Beverages across CCCs and FCCHs

Table 3 shows the barriers to implementation of nutrition EBPs. Furthermore, significantly more FCCHs than CCCs reported barriers such as predicting that children do not like the taste of healthier meals and snacks, ($\chi^2(1, N = 25) = 9.47, p = .002$), parents and guardians not supporting the idea of serving children healthier meals and snacks ($\chi^2(1, N = 14) = 8.33, p = .004$), and the lack of availability of healthy foods ($\chi^2(1, N = 11) = 12.67, p = .001$). Additionally, most frequently selected barriers across all ECEs were not having enough money to cover the cost of serving healthier meals and snacks, lack of control over types of meals and snacks delivered, having limited space for food storage such as refrigerator and cabinet space, and uncertainty about which foods could be reimbursed through CACFP.

Table 3. Barriers to serving foods and beverages in CCCs and FCCHs (*N* = 100)

Barrier to serving food and beverages	CCC (<i>n</i> = 51)	FCCH (<i>n</i> = 49)	χ^2	<i>df</i>	<i>p</i>	Total (<i>n</i> = 100)
	%	%				%
Not enough money to cover the cost	14.9	24.5	1.39	1	.24	19
Lack of control over delivered foods	29.8	17.4	1.98	1	.16	22
Lack of knowledge to prepare foods	6.1	10.2	.54	1	.46	8
Lack of time to prepare foods	10.2	17	.95	1	.33	13
Children would not like the taste of healthy foods	12.2	39.6	9.47	1	.002	25
Parents do not support healthy foods	4.1	24.5	8.33	1	.004	14
Limited space for food storage	20.4	12.5	1.10	1	.29	16
Lack of availability of healthy foods	0	22.9	12.67	1	< .001	11
Lack of support from other providers	6.3	4.1	.23	1	.63	5
Other areas have higher priority	8.2	14.3	.92	1	.34	11
Many different recommendations to follow	8.2	12.2	.45	1	.51	10
Unsure which foods can be reimbursed	10.4	18.8	1.34	1	.25	14
Limited time to shop	10.2	14.6	.43	1	.51	12
Total barriers (sum)	Mean (SD)	Mean (SD)	<i>t</i>	<i>df</i>	<i>p</i>	
	1.39 (2.44)	2.29 (2.68)	1.74	96	.09	1.84 (2.59)

Note: Chi-square analysis using 2 × 2 contingency table

Child Food Insecurity Characteristics across CCCs and FCCHs

Table 4 illustrates child food insecurity characteristics. The CCCs and FCCHs serve similar numbers of food secure and insecure children and employ a similar number of food security practices. Both typically refer the family to WIC and SNAP when they notice children

who may be food insecure. However, FCCHs providers more often serve children to make sure there is enough food for everyone compared to CCCs ($\chi^2(1, N = 32) = 7.35, p = .007$) whereas, CCCs than FCCHs are more likely to make sure children do not take too much food ($\chi^2(1, N = 14) = 4.95, p = .03$), tell children how much food to serve themselves ($\chi^2(1, N = 22) = 7.79, p = .005$), and food arrives already portioned on each child’s plate ($\chi^2(1, N = 18) = 9.18, p = .002$).

Table 4. Child food insecurity across CCCs and FCCHs ($N = 100$)

	CCC ($n = 51$) %	FCCH ($n = 49$) %	χ^2	df	p	Total ($n = 100$) %
Do you or your providers see a child who does not appear to be getting enough food to eat at home?						
Yes (insecure)	40	54.3	1.98	1	.16	45
No (secure)	60	45.7				51
When you or your providers see a child who does NOT appear to be getting enough food to eat at home, which of the following do they do?						
Feed the child more on Mondays and Fridays	7.8	10.2	.17	1	.68	9
Keep additional food on hand	17.6	16.3	.03	1	.86	17
Give food to the family to take home	5.9	8.2	.20	1	.66	7
Refer the family to the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)	21.6	36.7	2.79	1	.10	29
Refer the family to the Supplemental Nutrition Assistance Program (SNAP) [Formerly known as the Food Stamp Program]	23.5	34.7	1.51	1	.22	29
How does your program make sure that there is enough food for everyone at meals?						
Providers make sure children do not take too much food	21.6	6.1	4.95	1	.03	14
Providers serve children to make sure there is enough food for everyone	19.6	44.9	7.35	1	.007	32
Providers tell children how much food to serve themselves	33.3	10.2	7.79	1	.005	22
Serving cups or utensils hold the amount of food that children should take	37.3	42.9	.33	1	.57	40
This question does not apply. Food arrives already portioned on each child’s plate.	29.4	6.1	9.18	1	.002	18
This question does not apply. There is usually more than enough food available.	33.3	46.9	1.93	1	.17	40
Total food security practices (sum)	Mean (SD)	Mean (SD)	t	df	p	Mean (SD)
	2.59 (1.50)	2.64 (1.58)	.13	74	.90	2.62 (1.53)

Note: Chi-square analysis using 2×2 contingency table

Discussion

The purpose of this study was to examine nutrition EBPs across CACFP participating licensed CCCs and FCCHs serving 2- to 5-year-old children in two metropolitan counties of central California. The results reveal that ECE organizational structure (CCCs and FCCHs) and child food insecurity characteristics can influence nutrition EBPs with FCCHs reporting high implementation of nutrition EBPs and barriers, both CCCs and FCCHs refer families to WIC/SNAP when they observe child food insecurity and control how much food is served to children. Results from the current study have implications for research and programming priorities for childhood obesity prevention and addressing child food insecurity across CCCs and FCCHs in four distinctive ways.

First, both FCCHs and CCCs reported similar implementation of nutrition EBPs. However, FCCHs reported high implementation of nutrition EBPs than CCCs such as serving fruits (100%) and vegetables (100%), unflavored skim (nonfat) or 1% milk (93.8%), high-fiber wholegrain foods more than one time a day (100%), lean or low-fat meat (93.9%), fried or prefried meats less than one time a week (67.3%), and preparing cooked vegetables without fat or butter (98%). These findings indicate that participation in CACFP is associated with serving nutritious meals and snacks in ECE programs.^{13,17,24,25} A novel finding of this study is that FCCHs reported more healthful food and beverage practices than CCCs in contrast to the findings of the previous studies.^{7,13} An explanation for this novel finding may be related to the structure of the FCCHs. Typically, FCCHs are the owner of the programs, prepare food onsite, and therefore have more control over the implementation of changes within their programs compared to CCCs. Future research can examine how FCCHs adapt and sustain implementation of serving healthy foods and beverages which can provide insight and motivation to support other FCCHs who are struggling to serve healthy meals. Taken together, these findings related to nutrition EBPs are important and timely, considering the efforts to improve nutrition EBPs due to updated CACFP meal standards,¹⁰ making every bite count with the current dietary guidelines²⁶ and to begin childhood obesity prevention efforts early in life.²⁷

Second, although a few barriers were reported by both programs, more FCCHs than CCCs reported barriers to serving nutrition EBPs regarding children not liking the taste of healthier meals and snacks, families not supporting the idea of serving children healthier meals and snacks, and the lack of availability of healthy foods, suggesting the need for training opportunities regarding serving healthy foods and beverages to children. Existing studies have reported children not liking the taste of healthier foods^{28,29} and lack of availability of healthy foods.²⁸⁻³⁰ The finding that children are not liking the taste of healthier meals and snacks warrants further investigation to understand how FCCHs include children's food preferences during onsite food selection and preparation. It is important because all FCCHs in the current study reported preparing food onsite and being responsible for menu planning compared to CCCs, indicating that FCCHs have more direct control of what foods are served to children and how food is prepared than in CCCs. Furthermore, the barriers related to parents and guardians not supporting healthy meals and the lack of availability of healthy foods is consistent with existing studies.³¹ A potential explanation for the finding that parents do not support healthy meals may be the cost of purchasing

healthy foods and food waste.³² Introducing new and healthy foods may result in higher costs for parents with limited resources should their child reject the food item,³² since research has demonstrated it takes several tries for a child to accept a new food item.^{9,32} Future research should thus focus on exploring how FCCHs engage parents in communicating about nutrition, children's food preferences, and healthy foods as well as understanding the environmental barriers in FCCHs regarding practices to make available healthy foods in their programs.

Third, both programs reported less than optimal implementation (< 40%) of the following best practices: serving high-sugar/high-fat foods less than one time per week or never and never serving sugary drinks; CCCs and FCCHs did not report high actual or perceived implementation difficulty for any of the food and beverage practices. It is possible that CCCs and FCCHs are unaware of these practices, suggesting training needs in this area.

Finally, this study explored child food insecurity. The results reported that while both CCCs and FCCHs identified food-insecure children (i.e., see a child who does not appear to be getting enough food to eat at home) in their programs, more food-insecure children were reported by FCCHs (54.3%) than CCCs (40%). To address child food insecurity, findings indicated FCCHs and CCCs refer families to WIC and SNAP, which are recommended practices.^{5,9,11} However, it is surprising to see that approximately half of FCCHs and CCCs identified children who may be experiencing food insecurity, suggesting training needs for ECE providers on these referral services. Regarding making sure there is enough food for everyone at meals, FCCHs (44.9%) serve children to make sure there is enough food for everyone compared to CCCs (19.6%). CCCs are more likely to make sure children do not take too much food (21.6%), tell children how much food to serve themselves (33.3%), and food arrives already portioned on each child's plate (29.4%). While these findings indicate that participation in CACFP may provide a nutrition safety net for many food-insecure children, such practices also indicate that both CCCs and FCCHs are deciding how much children should eat that may not be supportive of children's self-regulation of energy intake³³ and are contrary to serving family-style meals as recommended by the Academy of Nutrition and Dietetics,⁹ CACFP,¹⁰ and existing study.²⁴ These findings show that ECEs are controlling how much food (portion sizes) is served to children either by serving preplated meals or serving children to make sure there is enough food for everyone to address child food insecurity. It is likely that practices may be different in programs with higher prevalence of food-insecure children as mentioned in previous studies.^{5,6} Additionally, given that family-style meal service in which children select their own portions promotes child autonomy and self-regulation of energy intake,^{9,24} a better understanding of why ECE programs are not implementing these EBPs is needed. Therefore, future research should explore how CCCs and FCCHs can practice responsive feeding and support children's self-regulation in eating within the context of food insecurity where preplated meal service is utilized or have the desire to control the amount of foods served to children.

This study has limitations. Although in the current study, ethnicity of the participants is representative of the demographics of central California, study was geographically limited. Our results are applicable but may not be generalizable because each state has unique regulations that govern the ECE programs. Moreover, findings from this study reflect only CACFP-licensed providers; data gathering among non-CACFP ECE programs is needed

to compare nutrition EBPs implementation and child food insecurity characteristics. Furthermore, survey responses may reflect social desirability bias and may not fully capture nutrition EBPs. It is likely that the self-reports may be biased in favor of desirable rather than actual practice. Finally, the strength of this study is the diverse and understudied sample of ECE programs and understudied implementation, barriers, and child food insecurity across CCCs and FCCHs in central California. Future research conducted in California should include central California to fully understand nutrition EBPs.

Conclusion

Present study findings yielded novel insights. Contrary to previous studies^{7,13} done in the United States, this study reported improved adherence to nutrition EBPs in FCCHs over CCCs in central California. Additionally, child food insecurity findings of this study highlighted the need to understand how CCCs and FCCHs can balance what constitutes an appropriate portion size in any given meal or snack while also practicing responsive feeding such as family-style meals in situations in which food insecurity is present. These findings suggest considering organizational structure (CCCs and FCCHs) and child food insecurity when developing targeted policies and interventions to improve nutrition EBPs across CCCs and FCCHs. Furthermore, CCCs and FCCHs must focus on equitably promoting nutrition and food security in early childhood by participating in CACFP. With CACFP participation, licensed CCCs and FCCHs can ensure some degree of nutrition and food security for all children in their care, as well as help families connect to federal food assistance programs when they observe child food insecurity. This benefits children's health and well-being and their learning in early childhood that has the potential to sustain healthy habits in their adulthood.

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