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Academy of Nutrition and Dietetics Benchmarks for Nutrition in Child Care 2011: Are Child-Care Providers across Contexts Meeting Recommendations?

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Abstract

The Academy of Nutrition and Dietetics (Academy) recommends feeding practices for child-care providers to establish nutrition habits in early childhood to prevent obesity. With >12 million US children in child care, little is known about child-care providers' feeding practices. The purpose of this study was to examine child-care providers' feeding practices to assess whether providers met the Academy's benchmarks and whether attainment of benchmarks varied across child-care contexts (Head Start, Child and Adult Care Food Program [CACFP], and non-CACFP). Cross-sectional data was collected in 2011 and 2012 from 118 child-care providers who completed self-administered surveys regarding their feeding practices for 2- to 5-year-old children. χ^2 tests and analysis of variance were used to determine variation across contexts. Head Start providers sat more frequently with children during meals ($P = 0.01$), ate the same foods as children (P=0.001), and served meals family style ($P < 0.0001$) more often compared with CACFP and non-CACFP providers. Head Start providers ($P = 0.002$), parents ($P = 0.001$), and children ($P = 0.01$) received more nutrition-education opportunities compared with CACFP and non-CACFP. Head Start providers encouraged more balance and variety of foods (P<0.05), offered healthier foods ($P < 0.05$), modeled healthy eating ($P < 0.001$), and taught children about nutrition ($P < 0.001$) compared with CACFP and non-CACFP providers. Providers across all three contexts used significantly more non-internal than internal mealtime verbal comments ($P < 0.0001$). Head Start providers had greater compliance with the Academy's benchmarks compared with CACFP and non-CACFP providers. Possible reasons for this compliance might be attributed to Head Start nutrition performance standards and increased nutrition-training opportunities for Head Start staff. Head Start programs can serve as a model in implementing the Academy's benchmarks.

Keywords: Child-care nutrition policies, Child-care providers, Feeding practices, Head Start Program, Child and Adult Care Food Program

The position statement released in 2011 by the Academy of Nutrition and Dietetics (Academy), Benchmarks for Nutrition in Child Care,[1] provides guidance for child-care providers in meeting benchmarks for healthful mealtime feeding practices for preschool children (aged 2 to 5 years) to help them develop long-term positive eating behaviors and prevent obesity. Specifically, the Academy recommends that providers model and encourage healthful eating, support children's hunger and satiety cues, serve meals family style, and not pressure children to eat.[1]

Child-care providers play an important role in shaping the health of our nation's children. More than 12 million preschool children attend child care, and typically consume half to three quarters of their daily energy while in full-time child-care programs,[2–5] which makes this an ideal setting for the promotion of healthful eating. Child-care programs serve as homes away from home, where children develop early nutrition-related behaviors that continue to shape their food habits and nutrient intake patterns—potential risk factors in obesity—through adolescence and adulthood.[6, 7–10] Young children are more likely than older children to be influenced by adults in an eating environment.[11] Among the social factors within the child-care environment, providers' feeding practices were highly associated with children's dietary intake.[12] Therefore, child-care providers offer potential opportunities for shaping children's dietary intake and eating behaviors,[13] and should be a primary focus for childhood-obesity prevention. However, existing obesity-prevention strategies are focused mainly on late childhood and adolescence and have limited success because eating behaviors are already established by school age.[10]

Achieving the Academy's benchmarks[1] is a public health priority, given that the prevalence of obesity among US preschool children is at an all-time high, with 26.7% of preschool children overweight or obese.[14] Obese preschoolers are predominantly at risk because of the strong trajectory of overweight and its spectrum of comorbidities (eg, type 2 diabetes,[15, 16] cardiovascular disease[17–20])

in adolescence and adulthood.[21–23] Epidemiological evidence suggests child-care experiences during the preschool years have a significant impact on weight status in childhood.[24,25] Achieving the Academy's benchmarks can benefit many low-income, minority children attending child care and their families at greatest obesity risk.[1] Yet, to our knowledge, research evaluating adherence to the Academy's 2011 benchmarks, with a focus on provider feeding practices, has not been published, indicating a prime opportunity for obesity prevention has been missed.

Variation in child-care nutrition policies creates different policy-based contexts (ie, Head Start, Child and Adult Care Food Program [CACFP], and non-CACFP) that can play an important role in how the Academy's benchmarks are addressed. The US Department of Agriculture's supplemental nutrition assistance program, CACFP, provides reimbursement for meals and snacks to 3.2 million low-income preschool children daily, but lacks nutrient-based standards.[26] Participating sites have to comply with meal pattern requirements to get reimbursed for the meals.[26] Head Start programs not only follow the CACFP meal pattern requirements, but are also required to follow Head Start Performance Standards for child nutrition, which require that providers use feeding practices that are similar to the Academy's benchmarks.[27] However, research evaluating adherence to Head Start standards is lacking.[5] In addition, given that licensing agencies in most states do not require specific feeding standards in child care,[28] it is unlikely that centers not falling under Head Start mandates would adhere to a formal set of healthful feeding practices such as those outlined in the Academy's benchmarks.

Despite the variation in nutrition policies across child-care contexts, to our knowledge, no published studies have evaluated how provider feeding practices vary across these policy-based contexts. Without such information, it is difficult to plan training or implement obesity-prevention efforts. Therefore, the objective of this study was to examine child-care providers' feeding practices to assess whether providers met the Academy's benchmarks and whether attainment of benchmarks varied across contexts (Head Start, CACFP, and non-CACFP). We hypothesized that federally regulated Head Start programs would be more proficient in achieving the Academy's benchmarks than programs enrolled in CACFP; and programs that are neither Head Start nor CACFP (non-CACFP).

Methods

This study was approved by the University of Illinois Urbana-Champaign Institutional Review Board for research involving human subjects. All subjects provided written informed consent before participating in the study.

Study Sample

Participants were providers recruited from center-based child-care programs participating in the STRONG Kids program, a larger longitudinal study at University of Illinois Urbana-Champaign that examines parental and home determinants of childhood obesity.[29] Child-care programs in three small urban communities were recruited from a sample with unequal probability of selection among licensed programs in a three-county diverse geographic area in the Midwest that met the following inclusion criteria: Head Start program operating within the grantee agency providing Head Start services in the target communities, or child-care center licensed by the state regulatory agency; located within 65 miles of the study center in one of four small urban areas targeted to maximize racial/ethnic diversity; and enrolled a minimum of 24 children in the age range of 2 to 5 years. These criteria identified 38 eligible programs from all child-care centers present in the three-county area, of which 36 (6 Head Start, 17 CACFP, and 13 non-CACFP) agreed to participate in STRONG Kids program. For this sub-project, 24 center directors (6 Head Start, 11 CACFP, and 7 non-CACFP) agreed for their providers to participate.

Survey Administration and Data Collection

Provider recruitment began in August 2011 and data collection was completed in February 2012. Center directors distributed consent forms to providers who met the eligibility criteria—employed full time at the child-care program, were present with children at lunchtime or, at a minimum, during snack time, and taught children ages 2 years and up. Providers who consented to participate could complete the survey online or in a paper format. Upon survey completion, providers were mailed a $10 gift card. A total of 123 child-care providers completed and returned the surveys (80% response rate). Data for 5 of the 123 participants was excluded from analyses because they reported only caring for children younger than 2 years.

Measures

To assess provider compliance with the Academy's benchmarks, we used previously validated instruments.

Demographic Characteristics. Provider characteristics[30] across contexts are presented in Table 1.

Nutrition and Physical Activity Self-Assessment for Child-Care (NAP SACC). The NAP SACC was developed to describe the nutrition, physical activity environment, and practices of child care.[31,32] Items from the NAP SACC included meals served family style and nutrition-education opportunities provided to providers, children. and parents.

Child Feeding Questionnaire (CFQ) and Comprehensive Feeding Practices Questionnaire (CFPQ). These questionnaires are valid measures that assess parents' attitudes and feeding practices with preschool children.[33–35] Therefore, slight modifications to the wording of the questions were made to reflect practices of child-care providers; for example, "My child should always eat all of the food on her plate" was modified to "Children at my table should always eat all of the food on their plate." Brann[36] used this same approach to examine family day-care providers' feeding practices and reported internal consistencies >0.65. Mean scores were calculated for each subscale, with possible mean item scores ranging from 1 to 5, with higher scores indicating a greater tendency toward these practices (e.g., 5 = always agree). Because of skewed responses on food as reward items on the CFPQ, with very little variation across responses, this subscale was dropped from subsequent analyses.

Table 1. Baseline characteristics across Head Start, Child and Adult Care Food Program, and non–Child and Adult Care Food Program child-care providers (N=118)[a]

Characteristic	Head Start (n=31) %	CACFP[b] (n=56) %	Non-CACFP (n=31) %
Race			
Not white	22.6	16.4	25.8
Non-Hispanic white	77.4	83.6	74.2
Marital status			
Single	35.5	39.3	32.3
Single-parent home	33.3	31.2	44.0
Two-parent home	66.7	68.8	56
Have children			
No	19.4	41.8	41.9
Yes	80.6	58.2	58.1
Education			
Some college/technical school (3 y) or less	32.3	55.4	61.3
College graduate (4 y) or more	67.7	44.6	38.7
Child-care provider type			
Assistant teacher	3.2	19.6	19.4
Lead teacher	96.8	80.4	80.6
		←*mean±standard deviation*→	
Provider age (y)	38.06±10.76	36.51±10.91	37.22±13.25
Work hours per week	38.22±5.96	39.78±2.85	39.8±0.9
Years of experience as child-care provider	11.44±9.22	11.6±8.51	9.48±9.85
Lunch time (min)	33.0±6.7	32.0±8.3	36.8±10.4
Provider feeding attitudes[c]			
Perceived provider weight	3.2±0.6	3.04±0.48	3.08±0.51
Child weight concern	1.97±0.96	2.14±1.1	1.85±0.85
Perceived responsibility	2.29±1.34	2.16±1.23	2.6±1.35

a. Comparisons of study groups made with Pearson's χ^2test and analysis of variance. There were no significant differences across study groups at α=.05. Percentages are values within study groups.
b. CACFP=Child and Adult Care Food Program.
c. Potential responses to provider feeding attitudes range from 1 to 5, with higher means representing a greater tendency toward the feeding attitude.

Meal-Time Provider Verbal Comments Checklist. Providers completed a checklist of 20 provider comments[37] to assess whether providers' meal-time verbal communication was supportive of children's internal cues of hunger and satiety. Providers responded whether they used the specific verbal comment during meal times using a Likert scale of 1 = never to 5 = always. Participant responses were summarized by creating a dichotomous yes/no variable by collapsing the Likert scale response "never" to "no" (i.e., provider does not use the specific verbal comment) and collapsing the responses "rarely," "sometimes," "mostly," and "always" to "yes" (i.e., provider uses the specific verbal comment). The sum of non-internal, internal, and total verbal comments used by each provider was calculated. The percentage of their use of non-internal verbal comments was calculated using the formula: sum of all non-internal verbal comments used by the provider/sum of total comments used by the provider ×100. The percentage of internal comments was calculated using the formula: sum of all internal comments/sum of total comments used by the provider×100.

The provider survey with these measures was reviewed by six early childhood and nutrition experts and pilot tested with five providers. Reliability for final survey measures was acceptable, with Cronbach's α ranging from .65 to .88 (Table 2).

Data Analysis

All statistical analyses were performed using the Statistical Package for the Social Sciences, version 17 (SPSS, Inc). All data were imported directly from SurveyMonkey (SurveyMonkey.com, LLC) into SPSS. Descriptive statistics and Cronbach's α was calculated to determine internal consistency of measures. For categorical variables, we used the χ^2 test of homogeneity in a contingency table to test the null hypothesis that a particular variable is distributed similarly across different levels of the child-care contexts (Head Start, CACFP, and non-CACFP). In addition, we used the *z* test to compare column proportions and adjusted *P* values with Bonferroni method. For continuous variables, we used one-way analysis of variance to test the equality of means for Head Start, CACFP, and non-CACFP and Tukey post hoc mean separation test to determine which means were different. Spearman rank correlations were used to examine the relationship between provider nutrition training, feeding attitudes, and feeding practices. The α level for all analyses was set at $P \leq 0.05$.

Results and Discussion

Provider Characteristics

The final sample consisted of 118 providers enrolled from 24 center-based child-care programs (6 Head Start, 11 CACFP, and 7 non-CACFP). As shown in Table 1, no significant differences were found across Head Start, CACFP, and non-CACFP provider characteristics.

Academy's Benchmarks for Child Feeding Practices and Nutrition Education. Overall, most providers were promoting healthy feeding by not using controlling feeding practices (eg, pressure or restriction) and serving healthy foods to children. However, we found significant differences between Head Start, CACFP, and non-CACFP providers for 10 of the 12 Academy's benchmarks (Table 3). In each case, Head Start providers reported practices more consistent with the Academy's benchmarks than CACFP and non-CACFP providers. For example, a higher proportion of Head Start staff used family-style meal service and modeled healthy eating. In addition, Head Start providers, parents, and children received significantly more nutrition training opportunities compared with their CACFP and non-CACFP counterparts (Table 3).

Providers across contexts did not meet the Academy's recommendation that they should work with children to understand their feelings of hunger and satiety. Providers can support children to recognize their feelings of hunger and satiety by using internal mealtime verbal comments (eg, "Are you full?") to cue children to their internal hunger and satiety signals.[37] However, providers used significantly more noninternal mealtime verbal comments than internal comments ($P < 0.0001$). The most frequent noninternal comments used by all providers included "Mmm. Mmm. It's good, eat some" (93% of providers), "Are you done?" (96% of providers), and "You want some more?" (97% of providers).

Verbally cueing children to attend to hunger and satiety can support their self regulation of energy intake; however, research demonstrates that adults' mealtime verbal communication is predominantly detrimental to children's attention to internal cues of hunger and fullness.[38–40] Adults over-ride children's internal cues by controlling food intake, rewarding, and restricting food.[41–43] Birch and colleagues found that children who were cued to the amount of food on their plate showed less responsiveness to

Table 2. Descriptive and internal consistency statistics for child-care providers (*N*=118) on the Child Feeding Questionnaire and Comprehensive Feeding Practices Questionnaire

Measures[a]	No. of items	Mean±standard deviation	Cronbach's α
Child Feeding Questionnaire			
Perceived provider weight	3	3.08±0.52	.72
Child weight concern	3	2.01±1.0	.74
Perceived responsibility	2	2.30±1.28	.67
Restriction	8	1.71±0.62	.71
Pressure to eat	4	1.99±0.9	.73
Comprehensive Feeding Practices Questionnaire			
Child control	2	3.50±1.37	.69
Emotional regulation	3	1.2±0.44	.65
Balance and variety	4	4.24±0.79	.76
Healthy foods offered	2	4.30±0.75	.68
Pressure	4	2±0.72	.67
Modeling	4	4.15±0.86	.88
Restriction for health	4	1.95±0.88	.69
Restriction for weight control	8	1.43±0.48	.66
Teaching about nutrition	2	3.8±0.92	.79

a. Potential responses to the questions of the Child Feeding Questionnaire and Comprehensive Feeding Practices Questionnaire range from 1 to 5, with higher means representing a greater tendency toward these feeding attitudes and practices.

Table 3. Assessment of the Academy of Nutrition and Dietetics' (Academy's) nutrition benchmarks across Head Start, Child and Adult Care Food Program, and non–Child and Adult Care Food Program child-care providers (*N*=118)

The Academy's Benchmarks for Nutrition in Child Care	Head Start (n=31)	CACFP[a] (n=56)	Non-CACFP (n=31)	χ^2/F[b]
Feeding practices	%[c]	%[c]	%[c]	
Providers sit with children during meals				
Never	0	0	0	16.33*
Rarely	0[x]	1.8[x]	3.2[x]	
Sometimes	0[x]	7.1[xy]	22.6[y]	
Mostly	12.9[x]	17.9[x]	29[x]	
Always	87.1[x]	73.2[x]	45.2[y]	
Providers eat meals together with children				
Never	0[x]	5.5[x]	9.7[x]	27.42***
Rarely	0[x]	5.5[x]	0[x]	
Sometimes	0[x]	7.3[xy]	22.6[y]	
Mostly	3.2[x]	14.5[xy]	25.8[y]	
Always	96.8[x]	67.3[y]	41.9[y]	
Meals are served family style				
Family style	96.8[x]	33.9[y]	6.7[z]	62.7***
Delivered and served in prepared portions	0[x]	23.2[y]	13.3[xy]	
Delivered in bulk and portioned by staff	3.2[x]	39.3[y]	80[z]	
Not applicable (not present at lunchtime)	0[x]	3.6[x]	0[x]	
Providers help children recognize their internal hunger and satiety cues and respect children's hunger and satiety cues once expressed				
Provider internal verbal comments	26	26.3	22.7	1.93
Provider noninternal verbal comments	74.6	73.2	77.4	2.62
Providers do not use controlling feeding practices	*mean ± standard deviation*			
Restriction for health	1.94±0.88	1.96±0.95	1.96±0.81	0.004
Restriction for weight control	1.45±0.55	1.42±0.44	1.43±0.52	0.06
Pressure to eat	1.74±0.8	1.98±0.87	2.25±1.01	2.51
Providers model healthful eating	4.71[x]±0.52	4.13[y]±0.8	3.67[z]±0.96	13.62***
Providers teach children about nutrition	4.33[x]±0.69	3.84[y]±0.9	3.23[z]±0.87	13.2***
Healthy foods are offered to children at center	4.6[x]±0.55	4.22[xy]±0.79	4.13[y]±0.78	3.7*
Providers encourage balance and variety of foods	4.54[x]±0.65	4.23[xy]±0.79	3.96[y]±0.86	4.18*

Table 3. Assessment of the Academy of Nutrition and Dietetics' (Academy's) nutrition benchmarks across Head Start, Child and Adult Care Food Program, and non–Child and Adult Care Food Program child-care providers (*N*=118)

The Academy's Benchmarks for Nutrition in Child Care	Head Start (n=31)	CACFP[a] (n=56)	Non-CACFP (n=31)	χ^2/F[b]
Nutrition training and education	**%**	**%**	**%**	
Training opportunities on nutrition provided for staff				
Rarely or never	9.7[x]	42.9[y]	41.9[y]	20.99**
<1 time per year	9.7[x]	12.5[x]	12.9[x]	
1 time per year	35.5[x]	35.7[x]	19.4[x]	
2 times per year or more	45.2[x]	8.9[y]	25.8[xy]	
Nutrition education for children provided through standardized curriculum				
Rarely or never	19.4[x]	57.7[y]	61.3[y]	15.48*
1 time per month	38.7[x]	23.1[x]	22.6[x]	
2-3 times per month	22.6[x]	7.7[x]	6.5[x]	
1 time per week or more	19.4[x]	11.5[x]	9.7[x]	
Nutrition education provided for parents				
Rarely or never	25.8[x]	66.7[y]	80.6[y]	23.93***
1 time per month	58.1[x]	29.6[y]	9.7[y]	
2-3 times per month	9.7[x]	1.9[x]	6.5[x]	
1 time per week or more	6.5[x]	1.9[x]	3.2[x]	

a. CACFP=Child and Adult Care Food Program.

b. Comparisons of study groups made with Pearson's χ^2 (categorical variables) and analysis of variance (continuous variables).

c. Percentages are values within study groups.

x/y/z: Superscripts denote statistical differences across child-care contexts at α=.5 as revealed by *z* tests with Bonferroni adjustment and Tukey post hoc analysis. Higher means (ranging from 1 [never] to 5 [always]) represent a greater tendency toward the provider feeding practice.

* For $P < 0.05$

** For $P < 0.01$

*** For $P < 0.001$

hunger and satiation as compared with children who were cued to their hunger and satiation while eating.[41] Limited child-care evidence also suggests Dutch[12] and Head Start[37] providers used significantly more non-internal verbal cues than internal cues. Our findings are consistent with previous research and extend the results reported by Ramsay and colleagues,[37] indicating that this pattern was consistent across all three child-care contexts.

Developing training for providers that focuses on using internal verbal comments during meal times for cueing children to understand their hunger and satiety is a feasible and low-cost approach that can help children self-regulate their energy intake.[44]

Most CACFP (66%) and non-CACFP (93%) providers did not meet the Academy's recommendation of serving foods and beverages family style, where children select their own portions and serve themselves[1] (Table 3). Serving meals family style allows children the control over the type and amount of food on their plates and helps them self-regulate their energy intake[1] as they learn to put the right amount of food on their plate based on their internal hunger and satiety signals.[45,46] Family style also increases the ability of teachers to model healthy eating compared with pre-plated service.[47] Similarly, sitting and eating meals together with children have been related to young children's healthy eating practices in child-care settings.[47 and 48] Therefore, CACFP and non-CACFP providers need to re-evaluate their approach to pre-plated foodservice by serving meals family style at least during one mealtime,[47] using internal verbal cues,[37] and sitting and eating meals with children to model healthy eating.[48]

The Academy discourages use of controlling feeding practices because they negatively impact child eating[49,50] and are a risk factor for childhood obesity.[51,52] However, we found a significant positive relationship between staff nutrition training and restricting foods for weight control ($r = 0.24$; $P < 0.05$), where providers control the child's food intake with the purpose of decreasing or maintaining child's weight. We also found a significant positive relationship between providers who were concerned about children's weight and the use of controlling feeding practices; for example, restriction of particular foods ($r = 0.38$; $P < 0.001$), pressure to eat ($r = 0.332$; $P < 0.001$), restriction for health ($r = 0.277$;

$P < 0.01$), and restriction for weight control ($r = 0.23$; $P < 0.05$). Therefore, staff training should discourage use of controlling feeding practices.

This exploratory study is not without limitations. Data collection was limited by use of convenience sample of child-care programs and providers. The data collected were self-reported and not observational, which might have led to response bias among child-care providers. The Child Feeding Questionnaire and Comprehensive Feeding Practices Questionnaire measures adapted for use with child-care providers were originally developed to assess parental feeding practices. Also, child-care providers were asked to respond to the questionnaire based on the preschool-aged children in their care. It is possible that different feeding practices are used with children of different ages, sex, and weight, and such differences were not ascertained in this study. These results might not apply to child-care centers and providers that have demographics other than the study sample. Despite these limitations, this is the first study to evaluate whether child-care providers are meeting the Academy's 2011 benchmarks[1] across child-care contexts.

Conclusions

Possible reasons for compliance with the Academy's 2011 benchmarks by Head Start providers may be attributed to Head Start's nutrition performance standards,[27] which require Head Start providers to use feeding practices that are similar to the Academy's benchmarks. This underscores the potential importance of child-care policies that provide guidance for improving provider–child interactions at meal time to improve child eating behaviors. Awareness of differences in nutrition policies across child-care contexts is critical when food and nutrition practitioners accommodate providers' training needs. Head Start programs can serve as a model in implementing the Academy's benchmarks, and CACFP programs would be well served in adopting policies similar to Head Start nutrition standards. The advantage to adopting such policies when participating in the CACFP program goes beyond reimbursement for food; it can provide exposure to, and support of, the Academy's benchmarks to prevent childhood obesity. By strengthening policies and training that are more aligned with the Academy's benchmarks,[1] child-care providers can be in a unique position to prevent childhood obesity by instilling positive eating behaviors related to self-regulation of the preschool-aged children in their care. In order to reach this goal, future research is warranted to identify staff challenges in meeting benchmarks and examine provider and program characteristics that might influence providers' feeding practices. Future large-scale observational studies with validated measures are warranted not only to examine compliance to benchmarks across child-care contexts, but also the impact of such compliance (or lack thereof) on eating behaviors (eg, food consumption, picky eating, eating in the absence of hunger) and weight status of children.

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