

Change in Nutrition and Physical Activity Practices in Early Childcare and Education Settings in Illinois During the COVID-19 Pandemic

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ABSTRACT

Context: For many young children, early childcare and education (ECE) programs are the only source of nutritious meals and physical activity (PA); however, the COVID-19 pandemic led to program closures, restrictions, and changed practices.

Objective: To examine changes in nutrition and PA-related best practices in ECE settings in Illinois from 2019, just prior to the pandemic, as compared to 2022. We also examined how changes over time varied by program type (ie, centers vs homes), Child and Adult Care Food Program (CACFP) status, and/or Head Start/Early Head Start status.

Design: The study design is a repeated cross-sectional survey administered in December 2019 and October 2022.

Setting: State of Illinois.

Participants: A total of 888 and 1162 ECE providers completed initial and follow-up surveys, respectively.

Intervention: NA

Main Outcome Measure: Provider report of meeting 14 nutrition and 9 PA-related best practices.

Results: Overall, 9 nutrition-related best practices were maintained and 5 declined over time. Centers, CACFP, and Head Start providers reported significant declines in meeting nutrition-related practices over time. A total of 8 PA-related best practices were maintained and 1 declined over time. Centers reported a significant decline in 5 of the PA-related best practices over time, and these declines were significantly different than in homes over time. Similarly, Head Start programs reported a decline in 4 PA-related best practices over time, and the change was significantly different from non-Head Start programs in 3 of the 4 practices.

Conclusion: The findings of this study should be considered a new baseline for ECE nutrition and PA-related best practices in Illinois and should serve as a wake-up call for advocates nationwide with regard to the provision of nutrition and PA-related best practices in centers and by CACFP and Head Start providers postpandemic.

KEY WORDS: CACFP, COVID-19, Head Start, nutrition best practices, physical activity best practices

The COVID-19 pandemic intensified early childcare and education (ECE) providers' struggles to provide quality childcare,

including meeting nutrition standards and physical activity (PA)-related best practices.¹⁻⁴ Prior research noted changes in nutrition and PA-related practices in

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and Referral System, and the providers who took the time to respond to our surveys.

University of Illinois Chicago's Institutional Review Board determined that this was not human subjects research (protocols #2019-1312 and #2022-1160 for the initial and follow-up surveys, respectively).

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childcare facilities during the pandemic.^{5,6} Childcare providers also found it difficult to keep up with constant changes to guidelines and recommendations.⁵ This is likely to have exacerbated existing disparities in access to high-quality childcare by low-income and minoritized populations that were also disproportionately impacted by COVID-19.^{1,2,7-9}

Early childcare and education programs are regulated at both the federal and state levels, both of which issued numerous changes to ECE licensing and standards during the pandemic. Irrespective of the pandemic, ECE providers participating in Head Start, a federally funded child development program for income-eligible children ages 3 to 5 years, are subject to nutrition and PA program standards¹⁰; while providers participating in the Child and Adult Care Food Program (CACFP), a federally funded nutrition assistance program for eligible children ages 0 to 5 years in childcare settings, must comply with CACFP nutrition standards to receive reimbursements for meals and snacks although providers were granted waivers from usual requirements during the pandemic.^{4,11} In addition, each state governs ECE programs through licensing standards, including requirements for quality childcare related to nutrition and PA. In Illinois, licensing standards for day care homes,¹² day care centers,¹³ and group homes¹⁴ include nutrition standards (that are more detailed for centers¹³); there are only vague activity requirements for day care homes.¹² The state has proposed expanding nutrition standards for centers to homes and group homes and establishing standards for PA, and screen time and sedentary time for homes and group homes.¹⁵ However, these proposed changes have yet to be promulgated.

While Illinois ECE providers await new licensing standards, they are rebuilding and reshaping what quality childcare looks like, specifically around nutrition and PA post-COVID-19. This study examined changes in nutrition and PA-related practices in ECE settings in Illinois from 2019, just prior to the pandemic, as compared to 2022, as a “new normal” emerges before updated state standards are implemented. We also examined whether changes over time varied by program type (ie, centers vs homes) and by CACFP and/or Head Start status.

Methods

Survey development

A survey was developed to capture ECE sites' nutrition- and PA-related practices and environments and site characteristics (survey available upon request)

as part of the Illinois State Physical Activity and Nutrition program funded by the Centers for Disease Control and Prevention as a way to understand the nutrition- and PA-related practices of Illinois ECE providers. The survey was programmed using Research Electronic Data Capture (REDCap) and allowed respondents to complete the survey online via an anonymous, public survey link.^{16,17} The study was deemed nonhuman subjects research by the University of Illinois Chicago's Institutional Review Board (protocols #2019-1312 and #2022-1160).

Survey administration and sample size

This repeated cross-sectional survey was administered at 2 time points. The initial survey was distributed via email in December 2019 to the Illinois Network of Child Care Resource and Referral Agencies' (INCCRAs') statewide list of ECE centers and family day care homes. Six follow-up emails were sent, and 2 Facebook posts advertised the survey between December and February 2020. A random sample of 229 respondents were awarded an Amazon electronic gift card ranging from \$20 to \$150 for their participation.

The follow-up survey was distributed in October 2022 to INCCRRA's updated list. To minimize the burden on INCCRRA and requests made to providers on their list, INCCRRA sent out an initial email, followed by Facebook posts on state Child Care Resource and Referral agencies' pages (n = 16 Facebook pages), 2 posts on its own Facebook page, and sent 1 final email in November 2022. A random sample of 300 respondents were awarded a \$25 Amazon electronic gift card for their participation.

The initial survey was sent to 7347 recipients on INCCRRA's list; 1065 completed responses were received. Responses were dropped where they were duplicates for the same site (62), no questions were answered (3), the site was an after-school program that did not serve our target age groups (0-5 years) (1), the site was license-exempt or did not specify its type (8), or the site only offered half-day programs (49), leaving 942 sites (13% of original 7347 recipients). Missing data on analytical covariates left 888 sites in the final analytical sample.

The follow-up survey was sent to 7718 recipients on INCCRRA's updated list; 4689 eligible completed responses were received. Sites that were license-exempt, did not serve our target age groups, or only offered half-day programs were excluded as ineligible and did not complete the rest of the survey. Because the follow-up survey relied more heavily on Facebook than emails for recruitment, additional steps were taken to

validate responses, and those that could not be verified as coming from existing childcare sites in Illinois or whose legitimacy was questionable were excluded. Specifically, 1223 sites were excluded that did not provide a valid Illinois zip code, provided a suspect site name (eg, blank or “Lego.com”), or had missing data for ≥ 1 questions. The 3466 remaining responses were manually verified by 2 study authors by searching for the provided site name, zip code, and site type on the Illinois Department of Children & Family Services Day Care Provider Lookup,¹⁸ the Illinois Cares for Kids Provider Search,¹⁹ ChildcareCenter.us, Google, and Yelp; 1368 were confirmed, 1856 could not be confirmed; and 242 were found to be duplicative for the same childcare site despite slight differences in site name, zip code, or type. Finally, of the 1368 verified responses, 156 were exact duplicates in site name, zip code, and type and were removed. This left 1212 sites (16% of original 7718 recipients); missing data on analytical covariates left 1162 sites in the final analytical sample.

Measures

Survey responses were used to create indicators for whether sites met 14 nutrition-related and 9 PA-related BPs, defined based on Go NAPSACC,²⁰ Caring for Our Children,²¹ and CACFP.²² (See Supplemental Digital Content Table S1 available at <http://links.lww.com/JPHMP/B330> for the definition and source for each BP.) Survey responses were also used to determine site characteristics.

The American Community Survey 2013–2017 5-year estimates were linked to survey responses based on zip code.²³ Measures included the percentage of the population that was Hispanic, non-Hispanic black, and non-Hispanic white, median household income, and population size. Zip code-level measures of race/ethnicity and income were used as a proxy for the characteristics of children enrolled at the sites, since most sites do not compile this information in a systematic way about all of their children/families. Data on zip code-level rurality were obtained from the Federal Office of Rural Health Policy.²⁴

One week after fielding the follow-up survey, we realized the disproportionate response we were getting based on Facebook posts and added a question asking how they heard about the survey (ie, email or Facebook). For responses received before that, we inferred how respondents heard about the survey from survey start times and whether responses appeared to be from sites that opened an email invitation to the survey. For the initial survey, a question on how respondents heard about the

survey was never included, and due to the timing of the Facebook posts and lack of data on which sites opened email invitations, we could not infer this either. However, given the predominant focus on email invitations for the initial survey, we believe few responses were from Facebook, and for our primary analyses, we treat all initial survey responses as being from email invitations. As a sensitivity analysis, we estimated the associations between site characteristics and whether responses came from Facebook using logistic regression models on the follow-up survey data. We used those estimates to calculate the predicted probabilities of responses to the initial survey coming from Facebook. We then re-estimated our main, uninteracted models, treating initial survey responses in the top 5% and 10% of predicted probabilities as Facebook responses. The results were very similar to those from our primary analyses.

Analyses

Multivariable logistic regression models with robust standard errors were computed using Stata/MP 17 to examine the association between sites meeting nutrition- and PA-related BPs and year, adjusting for site- and zip code-level characteristics and how respondents heard about the survey. Adjusted prevalence estimates were computed from the models. For 3 key characteristics of interest—program type, CACFP, and Head Start status—models were run, including interactions between year and each characteristic, in order to examine whether changes over time differed across sites. The statistical significance of differences in changes over time was assessed based on the coefficient of the interaction term, and changes over time by levels of the characteristic were computed based on linear combinations of model coefficients.

Results

Table 1 presents the sample characteristics. The recruitment methods yielded differences in the types of programs participating in the initial and follow-up surveys. The initial survey included a mix of program types that primarily served all age groups and included a combination of free/subsidized and fee-paying families; the follow-up survey respondents were primarily day care centers, with many not serving all age groups, that offered primarily free or state-subsidized tuition. The initial survey saw more respondents who participated in CACFP vs the follow-up survey; while a larger proportion of follow-up respondents reported participating in Head Start. Consistent with

TABLE 1
Sample Characteristics^a

Characteristics	Initial	Follow-up
	% or Mean (SD)	% or Mean (SD)
Program level		
ECE program type		
Family/Group Home	52.82%	27.11%
Day care center	47.18%	72.89%
Age groups served at ECE site		
All age groups (infants, toddlers, and preschool)	80.18%	41.31%
Not all age groups	19.82%	58.69%
Weekly fee payment sources		
Free and/or state-subsidized only	23.76%	68.59%
Free and/or state-subsidized and fee/tuition amount	21.85%	8.09%
Fee/tuition only	54.39%	23.32%
Program participates in CACFP		
Yes	76.24%	44.49%
No/I don't know	23.76%	55.51%
Program participates in Head Start/Early Head Start		
Yes	11.15%	35.89%
No/I don't know	88.85%	64.11%
Number of staff	9.56 (12.32)	14.15 (14.57)
Total enrollment capacity	51.68 (57.40)	116.04 (108.86)
Survey response to Facebook post	–	63.86%
Zip code–level		
Race/Ethnicity		
% Hispanic	14.81 (19.36)	15.00 (17.87)
% Non-Hispanic black	17.48 (26.64)	21.18 (29.09)
% Non-Hispanic white	61.83 (31.74)	56.68 (31.12)
Median household income (\$)	60,234.87 (23,836.44)	62,886.62 (28,966.99)
Population size	31,974.65 (24,273.91)	35,517.39 (24,208.29)
Rural as defined by FORHP		
% Nonrural	77.59	86.32
% Rural	22.41	13.68

Abbreviations: CACFP, Child and Adult Care Food Program; ECE, early childcare and education; FORHP, Federal Office of Rural Health Policy.

^aN = 888 programs for initial survey and 1162 programs for follow-up survey.

the follow-up survey including more centers, the number of staff and enrollment capacity reported by the sites were also larger than for the initial survey respondents. The zip code–level characteristics of the responding sites were comparable at both time points,

although there were somewhat fewer rural sites in the follow-up than in the initial survey.

The remaining results are based on analyses examining each of the BPs noted in Supplemental Digital Content Table S1 available at <http://links.lww.com/JPHMP/B330>. The results presented below are based on models that were adjusted for the characteristics in Table 1; by adjusting for all program characteristics, we are able to account for the differences in the respondent types from the initial to the follow-up surveys. For brevity purposes, all adjusted odds ratios, 95% confidence intervals, and adjusted prevalence estimates for each BP at the initial and follow-up surveys are presented in Tables 2 to 5 and in the relevant Supplemental Digital Content tables rather than restated below.

Changes in meeting nutrition-related BPs

Changes in implementation of nutrition-related BPs are presented in Table 2 (Supplemental Digital Content Table S2 available at <http://links.lww.com/JPHMP/B331> presents the unadjusted versions of the models). For 9 of the 14 nutrition-related BPs, there was not a significant change over time in the adjusted models; however, there were statistically significant declines in the adjusted models for meeting the remaining 5 nutrition-related BPs (ie, providing fried/pre-fried potatoes or fried/pre-fried meats [2 measures], not offering sugary drinks or cereals [2 measures], and rarely using food to calm upset children or encourage appropriate behavior).

We also examined changes in nutrition-related practices within each type of program (ie, centers and homes) and whether the change over time was significantly different for centers vs homes (Table 3). Within centers, programs became significantly more likely to report meeting 2 BPs but significantly less likely to report meeting 7 BPs over time. In contrast, with 1 exception (related to fried/pre-fried meats), day care home practices remained consistent over time. As indicated in Table 3, we did see statistically significant differences in changes over time in meeting nutrition-related BPs for centers vs homes, with centers more likely to see declines over time as compared to homes for 5 BPs and less likely for 1 BP.

There were also notable differences in changes in meeting nutrition-related BPs for CACFP vs non-CACFP programs (see Supplemental Digital Content Table S3 available at <http://links.lww.com/JPHMP/B332>). Programs that participated in CACFP were significantly less likely to report meeting 6 BPs at follow-up (as compared to the initial survey). Non-CACFP programs were less likely to meet 1 BP (ie, fried/pre-fried potatoes BP). Differences in change over time were

TABLE 2
Cross-Sectional Change in Meeting Nutrition-Related Best Practices From 2019-2020 to 2022^a

Best Practice	Adjusted OR (95% CI)	Adjusted P-Value	Adjusted Prevalence (%)	
			Initial	Follow- up
Space to breastfeed/express milk always available (N = 1258)	1.02 (0.78, 1.34)	.89	57.92%	58.37%
Comfortable breastfeeding locations (N = 993)	1.30 (0.94, 1.79)	.12	48.01%	53.10%
Dark green, orange, red, or deep yellow vegetables offered ≥ 1 time/d for 1-5 yo (N = 1906)	1.13 (0.89, 1.44)	.32	41.28%	44.03%
Fried/pre-fried potatoes $< 1 \times$ /wk to 1-5 yo (N = 1896)	0.60 ^b (0.46, 0.79)	$< .001$	62.75%	52.78%
Fried/pre-fried meats $< 1 \times$ /wk to 1-5 yo (N = 1905)	0.64 ^b (0.50, 0.82)	$< .001$	53.96%	44.21%
Drinking water always available for 1-5 yo (N = 1920)	1.16 (0.88, 1.54)	.29	59.98%	62.83%
No sugary drinks offered to 1-5 yo (N = 1912)	0.53 ^c (0.37, 0.76)	.001	72.02%	63.82%
100% Juice offered $\leq 1 \times$ /d for children < 2 yo (N = 1644)	0.78 (0.45, 1.32)	.35	93.26%	91.56%
100% Juice offered to children $\leq 1 \times$ /d for children 2-5 yo (N = 1861)	0.73 (0.38, 1.40)	.34	94.43%	92.68%
Never offers sugary cereals to children ages 2-5 (N = 1826)	0.76 ^d (0.58, 0.99)	.04	59.30%	53.94%
Responsive feeding techniques with infants < 1 yo (N = 1284)	0.96 (0.62, 1.49)	.85	82.01%	81.56%
Authoritative feeding style with 1-5 yo at meals/snacks (N = 1918)	0.83 (0.65, 1.07)	.15	49.16%	45.19%
Rarely use food to calm upset children or encourage appropriate behavior (N = 1898)	0.58 ^c (0.41, 0.82)	.002	69.72%	62.32%
Local foods offered as part of meals/snacks $\geq 1 \times$ /wk (N = 1783)	1.08 (0.81, 1.44)	.61	24.54%	25.91%

Abbreviations: CI, confidence interval; OR, odds ratio.

^aNumber (N) of programs varies with each best practice model based on survey responses. Each best-practice logistic regression model is run separately. Models adjust for all covariates shown in Table 1 and are estimated with robust standard errors.

^b $P < .001$.

^c $P < .01$.

^d $P < .05$.

significantly different for CACFP vs non-CACFP programs.

Similarly, there were a number of notable differences in nutrition-related BPs in Head Start programs from the initial to the follow-up survey (see Supplemental Digital Content Table S4 available at <http://links.lww.com/JPHMP/B333>). Head Start programs were significantly less likely to report meeting 6 BPs over time; while, non-Head Start programs only experienced changes in meeting 3 BPs. Differences in change over time were significantly different for Head Start vs non-Head Start programs.

Changes in meeting PA-related BPs

There were 9 PA-related BPs assessed in the survey; only 1 BP saw a statistically significant change from the initial to the follow-up survey (Table 4 and Supplemental Digital Content Table S5 available at <http://links.lww.com/JPHMP/B334> for the unadjusted models). Specifically, programs were significantly less

likely to report that outside of nap and meal times, toddlers (aged 13-24 months) were seated for < 15 minutes at any 1 time.

An examination of change over time in PA-related BPs by program type yields a different story (Table 5). A total of 5 of the 9 BPs saw statistically significant declines in their use by ECE centers over time (all significant at the $P < .05$ level or lower), while 3 BPs were significantly more likely for home-based programs over time. For all of the measures where centers saw a decline over time, there was also a statistically significant difference in the change experienced for centers vs homes (all becoming significantly less likely in centers relative to homes).

Finally, we examined whether there were changes over time in meeting PA-related BPs for Head Start and non-Head Start programs and whether there were differences in changes over time in Head Start vs non-Head Start programs (see Supplemental Digital Content Table S6 available at <http://links.lww.com/JPHMP/B335>). As the Supplemental Digital Content illustrates, Head Start programs reported significant

TABLE 3
Cross-Sectional Change in Meeting Nutrition-Related Best Practices by Program Type in 2019-2020 and 2022^a

Best Practice	Center			Home			Test of Difference in Change Over Time
	Change Over Time	Adj. Prevalence (%)		Change Over Time	Adj. Prevalence (%)		
	AOR (95% CI)	Initial	Follow-up	AOR (95% CI)	Initial	Follow-up	P
Space to breastfeed/express milk always available (N = 1258)	0.91 (0.61, 1.35)	59.23	56.96	1.10 (0.79, 1.55)	57.23	59.46	.44
Comfortable breastfeeding locations (N = 993)	1.66 ^b (1.04, 2.67)	43.97	54.02	1.06 (0.69, 1.60)	51.67	52.71	.14
Dark green, orange, red, or deep yellow vegetables offered ≥1×/d for 1-5 yo (N = 1906)	1.04 (0.75, 1.45)	39.23	40.15	1.22 (0.89, 1.67)	45.00	49.52	.47
Fried/pre-fried potatoes <1×/wk to 1-5 yo (N = 1896)	0.38 ^c (0.26, 0.57)	73.81	56.73	0.82 (0.59, 1.14)	50.65	46.71	.003
Fried/pre-fried meats <1×/wk to 1-5 yo (N = 1905)	0.57 ^d (0.40, 0.81)	60.92	49.13	0.70 ^b (0.51, 0.96)	44.96	37.50	.37
Drinking water always available for 1-5 yo (N = 1920)	0.98 (0.68, 1.43)	60.91	60.61	1.36 (0.96, 1.94)	60.73	66.59	.17
No sugary drinks offered to 1-5 yo (N = 1912)	0.30 ^c (0.18, 0.53)	79.16	65.53	0.79 (0.51, 1.24)	63.34	60.20	.005
100% Juice offered ≤1×/d for children <2 yo (N = 1644)	0.39 ^b (0.16, 0.94)	96.71	92.26	1.11 (0.59, 2.11)	88.96	89.92	.04
100% Juice offered to children ≤1×/d for children 2-5 yo (N = 1861)	0.42 (0.17, 1.04)	96.54	92.56	1.16 (0.49, 2.77)	92.13	93.07	.09
Never offers sugary cereals to children ages 2-5 (N = 1826)	0.45 ^c (0.31, 0.66)	70.39	56.61	1.13 (0.80, 1.59)	47.18	49.48	<.001
Responsive feeding techniques with infants <1 yo (N = 1284)	0.85 (0.49, 1.46)	76.82	74.50	1.14 (0.64, 2.05)	87.73	88.79	.42
Authoritative feeding style with 1-5 yo at meals/snacks (N = 1918)	0.58 ^d (0.42, 0.82)	52.83	40.86	1.14 (0.83, 1.56)	48.27	51.11	.002
Rarely use food to calm upset children or encourage appropriate behavior (N = 1898)	0.47 ^d (0.29, 0.76)	73.91	64.50	0.70 (0.45, 1.10)	62.40	57.51	.20
Local foods offered as part of meals/snacks ≥1×/wk (N = 1783)	1.71 ^b (1.11, 2.65)	13.80	21.42	0.85 (0.60, 1.19)	36.19	32.53	.007

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; ECE, early childcare and education.

^aNumber (N) of programs varies with each best practice model based on survey responses. Each best practice logistic regression model is run separately. Program type models compare the likelihood of meeting each best practice based on whether the ECE program is a center or a home (ref) in 2019-2020 and 2022, based on a model interacting program type and year. Change over time by program type was computed from the coefficients from these models, and the test of differences in changes over time was based on the statistical significance of the coefficient on the interaction term. Models are estimated with robust standard errors, and adjusted models adjust for all covariates shown in Table 1.

^bP < .05.

^cP < .001.

^dP < .01.

declines over time in meeting 4 BPs. In contrast, the only change for non-Head Start programs was in a decline in meeting the BP for time seated at any 1 time for toddlers. Overall, Head Start programs were significantly more likely to see a decline in meeting 3 BPs as compared to non-Head Start programs.

Discussion and Conclusion

The COVID-19 pandemic presented an unprecedented situation for ECE providers. While there have been studies of the impact of the pandemic on ECE enrollment challenges,^{5,25-28} program costs and responsibilities,^{5,25}

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TABLE 4
Cross-Sectional Change in Meeting Physical Activity-Related Best Practices From 2019-2020 to 2022^a

Best Practice	Adjusted OR (95% CI)	Adjusted P-Value	Adjusted Prevalence (%)	
			Initial	Follow-up
Remind children to drink water ≥1/ play period (N = 1969)	1.26 (0.97, 1.65)	.08	22.72%	27.00%
Tummy time offered to noncrawling infants <1 yo ≥2x/d (N = 1280)	0.77 (0.41, 1.45)	.42	93.18%	91.58%
No screen time allowed for children <2 yo (N = 1632)	0.95 (0.72, 1.27)	.74	49.79%	48.87%
≥90 min of indoor and outdoor PA is provided daily to children 2-5 yo (N = 1811)	1.06 (0.83, 1.36)	.64	40.30%	41.68%
Outside of nap and meal times, toddlers (13-24 mo) seated for <15 min at any 1 time (N = 1540)	0.63 ^b (0.45, 0.88)	.006	72.96%	65.69%
Outside of nap and meal times, children 2-5 yo seated for <15 min at any 1 time (N = 1786)	0.87 (0.68, 1.11)	.25	39.67%	36.54%
Teachers supervise, verbally encourage, and often join in to increase children's PA (N = 1814)	0.94 (0.74, 1.21)	.64	51.69%	50.33%

(continues)

supply chain issues,^{25,27} and challenges with virtual adaptations for operating a childcare facility,^{5,28} few studies have addressed changes in nutrition and PA-related BPs for ECE programs during the pandemic. In a study of ECE stakeholders, sponsors, and center directors, about one-third of respondents noted difficulty in finding healthy foods to purchase, 41% stopped serving family-style meals, and 20% served frozen or canned fruits and vegetables more than normal.⁵ A 2021 qualitative study reported a general decline in the nutritional quality of foods served at childcare programs

TABLE 4
Cross-Sectional Change in Meeting Physical Activity-Related Best Practices From 2019-2020 to 2022^a (Continued)

Best Practice	Adjusted OR (95% CI)	Adjusted P-Value	Adjusted Prevalence (%)	
			Initial	Follow-up
<30 min/wk of screen time allowed for children ages 2-5 (N = 1855)	0.89 (0.68, 1.15)	.37	46.95%	44.47%
Outdoor playtime is provided to preschool children (ages 2-5) and toddlers (ages 13-24 mo) 2x/d (N = 1912)	0.89 (0.68, 1.16)	.40	43.92%	41.91%

Abbreviations: CI, confidence interval; OR, odds ratio.

^aNumber (N) of programs varies with each best practice model based on survey responses. Each best practice logistic regression model is run separately. Models adjust for all covariates shown in Table 1 and are estimated with robust standard errors.

^bP < .01.

nationwide.²⁹ These findings align with our findings that nutritional BPs related to the quality of food served declined during the pandemic among Illinois ECE providers.

Research also suggests that homes fared better during the pandemic than centers. For example, a study of childcare providers in North Carolina reported that home providers had less of a drop in enrollment, remained open more often than centers, and even saw a slight growth in the number of providers.²⁶ Homes were often able to reopen sooner than centers as well.¹ Our research also found that homes may have fared better than centers, as homes remained more consistent over time with maintaining BPs than centers.

During the pandemic, states were allowed to implement multiple waivers for CACFP providers to reduce food insecurity. The meal pattern flexibility waiver allowed for providers to be reimbursed for meals and snacks that may not meet the meal pattern requirements.³⁰ While the waivers helped to counter food insecurity concerns, they may have had unintended consequences for the integrity of the meals that were provided.³¹ Illinois was one state that elected to utilize this waiver.³² The present study found that CACFP-participating programs became less likely to meet nutritional BPs over time, while there was limited change in non-CACFP-participating programs. Similarly, Head Start programs also

TABLE 5
Cross-Sectional Change in Meeting Physical Activity-Related Best Practices by Program Type in 2019-2020 and 2022^a

Best Practice	Center			Home			Test of Difference in Change Over Time <i>P</i>
	Change Over Time	Adj. Prevalence (%)		Change Over Time	Adj. Prevalence (%)		
	AOR (95% CI)	Initial	Follow-up	AOR (95% CI)	Initial	Follow-up	
Remind children to drink water ≥1/play period (N = 1969)	1.19 (0.83, 1.70)	22.23	25.34	1.33 (0.95, 1.87)	23.95	29.40	.63
Tummy time offered to noncrawling infants <1 yo ≥2×/d (N = 1280)	0.40 (0.15, 1.05)	94.67	88.52	1.05 (0.51, 2.18)	93.88	94.13	.08
No screen time allowed for children <2 yo (N = 1632)	0.44 ^b (0.28, 0.68)	73.91	58.92	1.40 ^c (1.01, 1.95)	31.46	38.12	<.001
90 min of indoor and outdoor PA is provided daily to children 2-5 yo (N = 1811)	1.31 (0.93, 1.86)	33.03	39.22	0.89 (0.65, 1.22)	48.68	45.77	.08
Outside of nap and meal times, toddlers (13-24 mo) seated for <15 min at any 1 time (N = 1540)	0.31 ^b (0.18, 0.51)	81.58	64.39	0.98 (0.65, 1.49)	67.68	67.41	<.001
Outside of nap and meal times, children 2-5 yo seated for <15 min at any 1 time (N = 1786)	0.68 ^c (0.48, 0.96)	43.19	34.59	1.07 (0.78, 1.47)	37.51	38.99	.04
Teachers supervise, verbally encourage, and often join in to increase children's PA (N = 1814)	0.87 (0.62, 1.22)	47.86	44.55	1.02 (0.73, 1.41)	58.68	59.07	.49
<30 min/wk of screen time allowed for children ages 2-5 (N = 1855)	0.38 ^b (0.26, 0.56)	70.53	51.73	1.62 ^d (1.16, 2.25)	25.27	34.22	<.001
Outdoor playtime is provided to preschool children (ages 2-5) and toddlers (ages 13-24 mo) 2×/d (N = 1912)	0.41 ^b (0.28, 0.59)	61.96	46.10	1.57 ^c (1.11, 2.22)	28.90	36.82	<.001

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; ECE, early childcare and education.

^aNumber (N) of programs varies with each best practice model based on survey responses. Each best-practice logistic regression model is run separately. Program type models compare the likelihood of meeting each best practice based on whether the ECE program is a center or a home (ref), in 2019-2020 and 2022, based on a model interacting program type and year. Change over time by program type was computed from the coefficients from these models, and the test of differences in changes over time was based on the statistical significance of the coefficient on the interaction term. Models are estimated with robust standard errors, and adjusted models adjust for all covariates shown in Table 1.

^b*P* < .001.

^c*P* < .05.

^d*P* < .01.

became less likely to meet BPs over time, while there were fewer changes among non-Head Start programs. For CACFP providers (and Head Start providers participating in CACFP-about half of Head Start providers in our follow-up study), this suggests that while waivers were critical in providing food to low-income children during the pandemic, they may have had the unintended consequence of negatively impacting meal and snack quality and suggests the need for additional work now that pandemic-era waivers have expired.

To our knowledge, this is the first study to assess changes in ECE providers' PA-related BPs during COVID-19. Findings from our study suggest that because ECE providers were meeting fewer PA-related BPs that opportunities for young children to engage in quality PA during the day would have been reduced. Notably, one of the biggest challenges that ECE providers who were open at any stage during the pandemic faced with regard to PA related to state or local requirements for social distancing and restrictions on use of outdoor spaces (eg, playgrounds)^{6,33}; as a result, another unintended consequence of these policy decisions may have been that providers were less likely to offer quality PA practices and, instead, engaged young children in more sedentary activities.³⁴

While this study provides the first evidence, to the authors' knowledge, of Illinois ECE providers' nutrition and PA-related practices during the pandemic, it is nonetheless subject to several limitations. First, likely as a result of changes in survey recruitment methods, sites that responded to the follow-up survey differed from those that responded to the initial survey on a number of characteristics. We adjusted for all available characteristics in the analyses, and these adjustments made a significant difference in the regression results, as can be seen by comparing the adjusted and unadjusted results. However, we are unable to account for any differences between sites that responded to the initial and follow-up surveys in terms of other characteristics not captured in our surveys. Second, surveys were conducted cross-sectionally, so we did not assess longitudinal changes in the same sites over time. Third, the analyses rely exclusively on self-reported measures from the survey of the extent to which sites met BPs, and we could not independently verify the extent to which they did so. Fourth, we did not have access to INCCRRA's email list, and Facebook posts were visible on sites not on that list, so we cannot link responses to an overall sampling frame. As a result, we cannot compute precise survey response rates, although our estimates would suggest that response rates were low (<20%), but we did get responses from throughout the state at both time points. Furthermore, we were unable

Implications for policy & practice

Findings from this study should serve as a new baseline for ECEs' meeting nutrition and PA-related BPs in Illinois and should serve as a wake-up call for advocates both within Illinois and nationwide as to the impact of the COVID-19 pandemic on the provision of nutrition and PA-related BPs in ECE settings. Key findings include:

- ECE providers in Illinois reported significant declines in a number of nutrition and PA-related best practices between 2019 (pre-pandemic) and the end of 2022.
- Centers, CACFP, and Head Start providers all saw significant declines in meeting nutrition and PA-related best practices, and for many practices, they were significantly different than changes experienced by homes, non-CACFP, and non-Head Start providers, respectively.
- Federal child nutrition waivers were critical in providing food to low-income children during the pandemic; they may have had the unintended consequence of negatively impacting the meal and snack quality offered by CACFP providers.

to specifically adjust for nonresponse, and although to the extent that nonresponse is related to site characteristics captured in our survey, we did adjust for those. Finally, surveys were only conducted in English, so it is possible there was some nonresponse due to language barriers.

This study provides a new “baseline” of ECE providers' nutrition and PA-related practices in Illinois. The information from this study will be important to guide technical assistance, training, and advocacy efforts statewide and nationally. While this study focused on Illinois ECE providers, one might assume that similar experiences were seen nationwide. Findings from this study provide a call to action for government agencies and ECE providers on the need to refocus efforts on ensuring healthy environments for children with guidance from state, regional, and local agencies and organizations working in the ECE space. Proposed regulations in Illinois, if promulgated, will provide an opportunity for these agencies and organizations to work statewide to help providers regroup and reprioritize, providing health environments for all children that they serve.¹⁵ Future research, including qualitative research, should seek to assess how providers are operating as we move farther from the COVID-19 public health emergency, with particular attention to providers serving disadvantaged groups, including low-income and minoritized populations. That information can then be used to develop continuing education and/or allocate funding to aid in creating healthy environments for all preschool children.

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