What Can Be Learned from Existing Investigations of Weight-Related Practices and Policies with the Potential to Impact Disparities in US Child-Care Settings? A Narrative Review and Call for Surveillance and Evaluation Efforts

Nicole Larson, PhD, MPH, RDN; Anna Ayers Looby, MPH; Natasha Frost, JD; Marilyn S. Nanney, PhD, MPH, RD; Mary Story, PhD, RD

ABSTRACT

Child-care settings and the combination of policies and regulations under which they operate may reduce or perpetuate disparities in weight-related health, depending on the environmental supports they provide for healthy eating and activity. The objectives of this review are to summarize research on state and local policies germane to weight-related health equity among young children in the United States and on how federal policies and regulations may provide supports for child-care providers serving families with the most limited resources. In addition, a third objective is to comprehensively review studies of whether there are differences in practices and policies within US child-care facilities according to the location or demographics of providers and children. The review found there is growing evidence addressing disparities in the social and physical child-care environments provided for young children, but scientific gaps are present in the current understanding of how resources should best be allocated and policies designed to promote health equity. Additional research is needed to address limitations of prior studies relating to the measurement of supports for weight-related health; complexities of categorizing socioeconomic position, ethnicity/race, and urban and rural areas; exclusion of legally nonlicensed care settings from most research; and the cross-sectional nature of most study designs. There is a particularly great need for the development of strong surveillance systems to allow for better monitoring and evaluation of state policies that may impact weight-related aspects of child-care environments, implementation at the program level, and needed implementation supports.


Despite recent evidence of progress in reducing pediatric obesity, the proportion of US children and adolescents at a weight exceeding the established age and sex-specific cutoffs for overweight and obesity remains high. Long-standing disparities in overweight and obesity prevalence, feeding practices, and screen media use have also remained at the forefront of public health concerns. Disparities in weight-related health impact US children as young as 2 to 5 years. The overall prevalence of obesity among children this age is 8.9%, but stark differences exist according to education of the household head, ethnicity/race, and area of residence. National data show that the prevalence of obesity is 13.6% among preschool-aged children who are part of households headed by an individual that did not complete high school, in contrast to 5.7% among children who are part of households headed by an individual with a post-secondary education. The prevalence of obesity is 5.2% among non-Hispanic white preschoolers, doubly high among non-Hispanic black preschoolers at 10.4%, and three times as high among Hispanic preschoolers at 15.6%. Prevalence rates of obesity have recently decreased among low-income preschoolers of diverse ethnic/racial backgrounds in several states, whereas in other states there has been no change or the prevalence of obesity has continued to increase.

Although multiple factors and settings contribute to disparities in weight-related health, child-care settings have
been identified as important environments to address as part of ongoing efforts to equitably reduce obesity among young children.\textsuperscript{13-17} The attention on child-care settings is justified by the benefits of establishing healthy behaviors at an early age.\textsuperscript{18,19} The opportunity to reach a large percentage of children, the high proportion of children that enter care already at an unhealthy weight, and demonstrated potential of interventions in these settings to positively impact weight-related behaviors.\textsuperscript{20} More than 60% of US children under the age of 5 years are in some form of regular child-care arrangement, including child-care centers, family homes, Head Start programs, and prekindergarten programs.\textsuperscript{21} In addition, many children receive frequent care from neighbors, relatives, or family friends in unlicensed or license-exempt settings.\textsuperscript{21} Given that child-care settings represent the most common environment where children of preschool age spend their time outside of the home, it will be critical in developing future obesity-prevention efforts to understand the different types of barriers to promoting healthy weight behaviors that are experienced by child-care providers and what additional supports may be needed. Child-care settings and the combination of policies and regulations under which they operate may serve to reduce or perpetuate weight-related disparities, depending on the environmental supports they provide for healthy eating and activity behaviors.

Research addressing the role of child-care settings in preventing obesity has grown over the past decade in response to earlier calls for attention on this context,\textsuperscript{16,20} but much work remains to be done with regard to addressing disparities. To the authors’ knowledge, previously published reviews addressing the child-care setting have not specifically focused on factors of relevance to weight-related health among vulnerable US populations of young children (0 to 5 years). The objectives of this narrative review article include summarizing the existing research on state and local policies germane to weight-related health equity among US young children, and how federal policies and regulations may provide supports for child-care providers who serve families with the most limited resources. In addition, a third objective of this article is to comprehensively review studies that have examined whether there are differences in practices and policies within US child-care facilities according to the location or demographic characteristics of providers and enrolled children. The evidence base is qualitatively analyzed and further discussed in the context of additional research, surveillance, and evaluation efforts needed to better inform future endeavors to promote equity through program and policy development.

METHODS

Searches in PubMed, MEDLINE, the Cumulative Index to Nursing and Allied Health, and Web of Science were completed to identify relevant, peer-reviewed research studies published between January 2006 and June 2016. Research published before January 2006 was not reviewed, given the importance of understanding the current environment and evidence there have been many efforts over the past decade to strengthen policies and practices relevant to the weight-related health of children.\textsuperscript{22-24} The following search terms were used in combination: child care, preschool, Head Start, policy, disparity, equity, nutrition, dietary intake, physical activity, motor skills, sedentary activity, overweight, and obesity. Search results, including article titles and abstracts, were examined by the first author and the full text of all potentially relevant articles was retrieved for detailed evaluation. To be included in this narrative review, articles had to be published in English; address at least one of the objectives; and describe research of relevance to US infants (0 to 1 year), toddlers (1 to 2 years), or preschool-aged children (2 to 5 years) enrolled at child-care centers or family child-care homes. Articles were excluded if they did not focus on child-care practices or policies of direct relevance to weight-related health. The reference citations within identified articles were also examined to ensure that all relevant evidence was retrieved. This search strategy identified five detailed studies of state and local policies, eight studies addressing the complementary impact of state and federal policies, 14 studies that focused on federal policies and regulations, and 12 studies that are relevant to understanding how practices and policies can differ according to the location or demographic characteristics of providers and enrolled children.

STATE OF THE SCIENCE

State and Local Policies

State-level policies (including regulations), and in limited situations, local-level policies (such as health codes), provide important opportunities to address weight-related health disparities among young children enrolled in child care. Most states license a number of different categories of child-care facilities, but the majority of states differentiate between child-care centers and family child-care homes.\textsuperscript{24} Recent reports published by the National Center for Chronic Disease Prevention and Health Promotion and the National Resource Center for Health and Safety in Child Care and Early Education indicate that most states lack strong regulations relating to the promotion of healthy eating and physical activity, and that family child-care homes, particularly smaller homes, tend to have fewer regulations that guide these behaviors.\textsuperscript{22,25} Although several states implement other strategies to address obesity prevention in child-care settings (eg, provide obesity-prevention training for providers, include obesity-prevention topics in their Quality Rating and Improvement System, provide support for farm to early care and education programs) and providers may go beyond what is required by regulations in supporting healthy eating and physical activity, written policies are often lacking to help guide these efforts and ensure that all providers and young children have equal access to evidence-based best practices for achieving a healthy weight.\textsuperscript{25} The detailed studies of specific practices identified for this review addressed gaps in support for breastfeeding,\textsuperscript{26} food and beverage standards,\textsuperscript{17,27} increasing physical activity,\textsuperscript{17,28,29} and decreasing sedentary time\textsuperscript{17,28,29} (Table 1). In addition, a small number of studies have evaluated the complementary impact of federal and state policies on child-care environments and their potential to play a role in promoting health among the most vulnerable US populations (Table 2).

Supports for Breastfeeding and Standards for Food and Beverages. Regulations addressing supports for breastfeeding were examined as part of a nationwide analysis.
<table>
<thead>
<tr>
<th>Author(s), year, reference</th>
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<th>Study design</th>
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<tr>
<td>Benjamin Neelon and colleagues, 2015&lt;sup&gt;26&lt;/sup&gt;</td>
<td>State licensing and administrative regulations for child-care facilities were reviewed for all 50 US states, the District of Columbia, Puerto Rico, the US Virgin Islands, Guam, and the Department of Defense</td>
<td>Review completed for both child-care centers and family child-care homes in 2012</td>
<td>Standards to support breastfeeding in child-care settings: 1) Encourage and support breastfeeding 2) Have a designated place for mothers to breastfeed 3) Avoid serving of solids before infants are 4 mo old 4) Avoid providing infant formula to a breastfed infant without parental permission</td>
<td>The majority of states had, on average, less than one regulation meeting the evaluated standards Delaware, Georgia, Michigan, Mississippi, and Texas had regulations that partially or fully addressed each standard for child-care centers Only Delaware and Mississippi had regulations that partially or fully addressed each standard for child-care homes Regulations addressing the introduction of solid foods and parental permission to give formula were more common than regulations supporting breastfeeding in general or requiring a designated place for mothers to breastfeed</td>
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<td>Slining and colleagues, 2014&lt;sup&gt;29&lt;/sup&gt;</td>
<td>State licensing and administrative regulations for child-care facilities were reviewed for all 50 US states, the District of Columbia, Puerto Rico, the US Virgin Islands, Guam, and the Department of Defense</td>
<td>Review completed for both child-care centers and family child-care homes in 2013</td>
<td>Recommendations for promoting infant physical activity: 1) Provide daily opportunities to move freely 2) Engage with children on the ground each day 3) Provide daily “tummy time” 4) Use cribs, car seats, and high chairs for their primary purpose only 5) Limit the use of equipment such as strollers, swings, and bouncer seats/chair for holding children while they are awake</td>
<td>Most states had between one and three regulations related to recommended actions for promoting physical activity For child-care centers, 12 states did not have any regulations related to the recommendations and only four states had regulations related to 4 to 5 of the recommendations For child-care homes, 13 states did not have any regulations related to the recommendations and only two states had regulations related to 4 to 5 of the recommendations</td>
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Table 1. Patterns in state and local policies and observed differences relevant to the environments provided by US child-care centers and family child-care homes (continued)

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<td>Duffey and colleagues, 2014$^28$</td>
<td>State licensing and administrative regulations for child-care facilities were reviewed for all 50 US states, the District of Columbia, Puerto Rico, the US Virgin Islands, Guam, and the Department of Defense</td>
<td>Review completed for both child-care centers and family child-care homes in 2013</td>
<td>Recommendations to promote physical activity for toddlers and preschoolers: 1) Provide opportunities to be physically active throughout the day 2) Provide a community and built environment that promotes physical activity 3) Implement appropriate strategies to ensure that the amount of time spent sitting or standing still is limited 4) Provide training in ways to increase children’s physical activity and decrease sedentary behavior, and in how to counsel parents about their children’s physical activities</td>
<td>Most states had just three regulations related to recommended actions for promotion of physical activity (mean±standard deviation=4.1±1.4 for centers, 3.8±1.5 for homes) Regulations for centers and homes most consistently addressed the provision of outdoor and indoor environments with a variety of portable play equipment and adequate space per child Fewer than half of states and territories had regulations consistent with recommendations to limit screen time No state or territory had regulations for centers or homes that were consistent with recommendations for staff to join children in physical activity, encourage seeking expert consultation, and encourage educators to receive training in ways to promote physical activity</td>
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<td>Benjamin and colleagues, 2009$^27$</td>
<td>State administrative regulations for child-care facilities were collected from the website for the National Resource Center for Health and Safety in Child Care and Early Education and reviewed for all 50 US states and the District of Columbia</td>
<td>Review completed for both child-care centers and family child-care homes in 2007</td>
<td>In relation to dietary intake, five standards for menus were evaluated: 1) Posted or made available to parents 2) Dated 3) Reflect the food served 4) Planned in advance 5) Kept on file</td>
<td>For child-care centers, 10 states did not have any regulations related to the five menu standards and only 7 states had regulations addressing each of the standards; 8 states required menus to be reviewed by a nutrition professional For child-care homes, 27 states did not have any regulations related to the menu standards and only 3 states had regulations addressing each of the standards; just 3 states required menus to be reviewed by a nutrition professional</td>
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Table 1. Patterns in state and local policies and observed differences relevant to the environments provided by US child-care centers and family child-care homes (continued)

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<td>Kaphingst and Story, 2009&lt;sup&gt;17&lt;/sup&gt;</td>
<td>State licensing regulations were collected from both the website for the National Resources Center for Health and Safety in Child-care and Early Education and state government websites and reviewed for all 50 US states</td>
<td>Review completed for both child-care centers and family child-care homes in 2006</td>
<td>Benchmarks related to dietary intake, physical activity, and media use were evaluated. The 13 benchmarks addressed the number and nutritional quality of meals and snacks, limiting of foods of low nutritional value, opportunities for gross motor activity, vending machines, outdoor activity time, required time for physical activity, and limits on media use</td>
<td>Regulations were found to vary considerably by state and, within each state, for different types of settings. Centers were most heavily regulated. With regard to dietary intake, the most common regulation was for child-care providers to follow the Child and Adult Care Food Program or similar meal pattern requirements. No states provided specific nutrition standards for foods of low nutritional value. With regard to physical activity, the most common regulations addressed requirements for gross motor and daily outdoor activity time. Only two states quantified the amount of time that children should be engaged in physical activity. With regard to media use, the most frequently mentioned forms of media were television, videos, video games, and computers. Only 10 states set quantified time limits on screen time.</td>
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<sup>a</sup>The focal weight-related behavior that was studied is shown in bold type.
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<td>Benjamin Neelon and colleagues, 2016&lt;sup&gt;31&lt;/sup&gt;</td>
<td>Child-care centers serving low-income families in South Carolina (33 centers participating in the ABC Child Care Program) and North Carolina (26 centers accepting state subsidies); 3 children per center were observed</td>
<td>Observations were conducted before and 9 mo after new nutrition standards for the ABC Child Care Program took effect in October 2012</td>
<td>Trained research staff used the Environment and Policy Assessment and Observation tool along with the Diet Observation in Child Care tool to evaluate alignment with the new dietary intake standards addressing beverages, fruits, vegetables, whole grains, other foods (eg, sweets), and center policies and practices</td>
<td>In South Carolina, no centers were consistent with all 13 standards at baseline, but 2 were consistent with all standards at follow-up. No centers in North Carolina were consistent with all standards at baseline or follow-up. After the nutrition policy was implemented, South Carolina centers increased their compliance with the standard to prohibit using food as a reward or punishment and there was some indication that centers made improvements in limiting sweet food and the provision of two different fruits (excluding juice) at least twice per day</td>
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<td>Ritchie and colleagues, 2015&lt;sup&gt;33&lt;/sup&gt;</td>
<td>Licensed child-care providers in California were selected in 2008 (n=429) and 2012 (n=435) to represent Head Start centers, state preschools, other centers participating in CACFP, non-CACFP centers, family child-care homes participating in CACFP, and non-CACFP child-care homes</td>
<td>Care providers completed self-administered surveys online or by mail before federal&lt;sup&gt;1&lt;/sup&gt; and state&lt;sup&gt;4&lt;/sup&gt; policies relevant to water provision were enacted in 2008 and after both sets of policies were enacted in 2012</td>
<td>Water consumption: Frequency of providing drinking water to children at the table with meals or snacks Availability of self-serve drinking water indoors and outside</td>
<td>In 2012, child-care sites were 2.36 times more likely to provide water at meals or snacks than sites in 2008; a larger percentage of sites served water all of the time with meals or snacks in 2012 than in 2008 (47% vs 28%) A larger percentage of child-care sites made water easily and visibly available for children to self-serve both indoors and outside in 2012 compared to 2008 There was no difference in 2012 in the percentage of sites always serving water at the table between CACFP and non-CACFP sites or between centers and homes In 2012, more CACFP than non-CACFP sites made water easily available to children indoors (78% vs 69%) and outside (78% vs 69%)</td>
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Table 2. State policies, administrative guidelines, and local health codes with the potential to promote weight-related health equity among infants, toddlers, and preschoolers (continued)

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<td>Kakietek and colleagues, 2014&lt;sup&gt;28,39&lt;/sup&gt;; Lessard and colleagues, 2014&lt;sup&gt;40&lt;/sup&gt;; Stephens and colleagues, 2014&lt;sup&gt;41&lt;/sup&gt;</td>
<td>Child-care centers (n=176) serving low-income communities in New York City, including centers served by DPHO and non-DPHO neighborhood centers</td>
<td>A center evaluation (facilities observation and interviews with director, 2 teachers, and foodservice director) was completed in Fall 2009 and a classroom evaluation (2-day observation of staff and child behaviors) was completed in Spring 2010 to examine the impact of 2006 revisions to Article 47 of the New York City Health Code and training and technical assistance for providers</td>
<td><strong>Beverage choices and physical activity:</strong> Compliance with nine local regulations, which set standards for beverages served and strengthened requirements for physical activity offered</td>
<td>High levels of reported and observed compliance were found for most regulation requirements; the percentage of centers that were classified as compliant in both components of the evaluation ranged from 21.5% for structured physical activity to 86.1% for television time. Beverage regulation compliance was associated with participation in CACFP and shorter operating hours but was unrelated to indicators of training or technical assistance. Physical activity regulation compliance was associated with smaller classroom size, shorter operating hours, lower teaching staff turnover, private outdoor facilities for physical activity, number of staff members that participated in Sport, Play and Active Recreation for Kids (SPARK) training and other physical activity trainings.</td>
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<td>Sekhobo and colleagues, 2014&lt;sup&gt;42&lt;/sup&gt;</td>
<td>WIC&lt;sup&gt;e&lt;/sup&gt;-enrolled preschool children ages 3 to 4 y within New York City neighborhoods of the Bronx, Manhattan, and Brooklyn during the years 2004 to 2006 (n=148,785 children) and 2008 to 2010 (n=170,091 children)</td>
<td>An ecologic, time-trend analysis of body mass index data obtained from the New York State component of the Pediatric Nutrition Surveillance System was used to evaluate the impact of 2006 revisions to Article 47 of the New York City Health Code and the training and technical assistance provided to providers within high-risk neighborhoods (identified by elevated rates of rates of illness and death)</td>
<td>Childhood obesity prevalence within neighborhoods in relation to shifts in support for healthful beverage choices and physical activity</td>
<td>The prevalence over time of childhood obesity among preschool children enrolled in WIC was consistently higher in high-risk neighborhoods than in low-risk neighborhoods. Childhood obesity prevalence declined in all study neighborhoods but the declines were greatest in high-risk neighborhoods of the Bronx and Manhattan with average annual percentages changes that ranged from −4.7% to −2.6%; observed changes led to a narrowing of the gap in early childhood obesity prevalence between high-risk and low-risk neighborhoods of these boroughs.</td>
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| Lessard and colleagues, 2013 | Statewide representative sample of child-care centers (n=176) in Delaware | Trained survey staff visited each center and administered questionnaires to the director and two randomly selected teachers in Fall 2011 | **Dietary intake and water consumption:** Compliance with 10 statewide licensing standards established in 2007 (by the Delaware Office of Child Care Licensing) to address fried or pre-fried and then baked vegetables, processed meats, fried or pre-fried meats, cheese type, whole grains, sweet grains/breads, juice type, juice quantity, water availability inside, and water availability outside | Compliance varied across components of the regulations and within centers; the highest levels of consistent compliance (by both surveyed teachers) were seen for juice type (88.3%) and water availability inside the center (82.1%) and the lowest levels for whole grains (18.6%) and water availability outside the center (35.6%) and fried or pre-fried meats (51.4%)
|
|                           |                    |              |                                               | In general, independently owned and operated centers were less likely to comply with the regulations except for the regulation related to water availability outside Head Start programs were more likely to consistently be in compliance with the fried or pre-fried vegetable and sweet grain regulations Centers participating in the CACFP were less likely to report consistent compliance with the processed meat regulation and more likely to comply with the whole grains regulation |
A complementary analysis of standards for toddler and preschooler menus was conducted in 2007 and another analysis addressing benchmarks for foods and beverages was conducted in 2006. The analysis of supports for breastfeeding focused on the following four national health and safety performance standards developed by the American Academy of Pediatrics, American Public Health Association, and National Resource Center for Health and Safety in Child Care and Early Education: 1) facilities should encourage and support breastfeeding; 2) facilities should have a designated place for mothers to breastfeed; 3) solid foods should not be introduced before infants are 4 months of age, but preferably 6 months; and 4) infant formula should not be fed to a breastfed infant without parental permission. Similarly, the menu standards analysis was informed by the national health and safety performance standards and investigated whether regulations exist to ensure that toddler and preschooler menus are posted or made available to parents, dated, accurate in listing the foods served to children, planned in advance, and kept on file. The analysis addressing benchmarks for foods and beverages specifically examined meal and snack pattern requirements, limits for foods of low nutritional value, and policies for vending machines. Together the findings of these three studies suggested there are deficiencies in existing regulations for both center-based and home-based child-care settings that should be addressed as part of efforts to strengthen the content. For example, the majority of US states and territories had less than one regulation related to the national health and safety performance standards for supporting breastfeeding. Very few states had regulations that partially or fully addressed all four standards relating to breastfeeding for center-based care settings (n=5 states) or home-based care settings (n=2 states). The pattern was similar for menu standards with overall few states having relevant regulations for all five standards, but there were more states that had comprehensive regulations for center-based care (n=7) than states with comprehensive regulations for home-based care (n=3). Supports for Increasing Physical Activity and Decreasing Sedentary Time. With regard to physical activity and sedentary time, the most recent nationwide analyses of licensing and administrative regulations were conducted in 2013. One recent analysis focused on settings providing care for infants and the second focused on the provision of care for toddlers and preschoolers. The following five policy-based recommendations made by the National Academy of Medicine were identified as relevant to infant physical activity patterns and were examined: 1) provide daily opportunities to move freely; 2) engage with infants on the ground each day; 3) provide daily tummy time; 4) use cribs, car seats, and high chairs for only their primary purpose; and 5) limit the use of equipment such as strollers, swings, and bouncer seats for holding infants while they are awake. Likewise, another recent analysis focused on 15 potential actions supported by four policy-based recommendations made by the National Academy of Medicine to address the prevention of obesity among toddlers and preschoolers: 1) provide opportunities to be physically active throughout the day; 2) provide a community and built environment that promotes physical activity; 3) implement strategies to limit the time that toddlers and preschoolers spend sitting or standing still; and 4) provide training in ways to increase children’s physical activity and decrease children’s sedentary behavior, and in how to counsel parents about their children’s physical activities. Results of both analyses identified several opportunities for strengthening state-level regulations for both center and home-based settings. For example, fewer than half of US states and territories had regulations consistent with recommendations to limit young children’s screen time and no regulations existed that were consistent with recommendations for staff to join children in physical activity, encourage seeking expert consultation, or encourage educators to receive training in ways to promote physical activity. Although most states and territories included regulations addressing the provision of outdoor and indoor play spaces with a variety of portable equipment, few other regulations relevant to promoting activity among toddlers and preschoolers were widely established. The average number of potential actions addressed by regulations was approximately just 4 of the 15 actions evaluated for both child-care centers and child-care homes. Most states similarly had only between one and three regulations related to the five National Academy of Medicine recommendations for promoting physical activity among infants.

Evaluations of State and Local Policies. Evaluations of state and local policies have been completed across the United States in South Carolina, California, Delaware, and New York City (Table 2). This research has produced some evidence that demonstrates the potential for policies and codes to increase access to healthy food and active play opportunities and improve child health behaviors and weight outcomes, but also emphasizes the importance of training providers and monitoring efforts to ensure that all needed supports are in place for full implementation. Standards developed for the ABC Child Care Program in South Carolina were found to reduce the use of food for rewarding or punishing behavior and mostly nonsignificant findings suggested improvement in the quality of foods provided to low-income children enrolled in subsidized care. The California Healthy Beverages in Childcare Law was evaluated in combination with the Healthy, Hunger-Free Kids Act and related to increases in the percentage of child-care sites in the state that made water easily available for children to self-serve both indoors and outdoors. Statewide licensing standards in Delaware (Delacare Rules) were similarly shown to improve the nutritional quality of juice served to children and the indoor provision of water to children. In addition, extensive evaluation efforts that were undertaken to assess the impact of new health codes for New York City child-care facilities serving low-income children have demonstrated improvements in the provision of physical activity opportunities, children’s dietary intake, children’s moderate-to-vigorous physical activity, and the prevalence of childhood obesity.
Federal Policies and Regulations designed to Protect Low-Income Populations

The recent revisions to the Child and Adult Care Food Program (CACFP) regulations in combination with enhancements to the federal performance standards for Head Start Programs provide promising opportunities for reducing disparities in rates of overweight and obesity among young children. The CACFP was established in 1968 to help ensure that low-income children receive adequate calories and nutrients to support healthy development. All nonprofit child-care centers, for-profit child-care centers that serve lower income children, Head Start Programs, and family child-care homes that have a sponsoring organization are eligible to participate. An average of 4 million children enrolled in these care settings are provided with meals and snacks through the CACFP on a given day. The CACFP is jointly administered by the US Department of Agriculture and designated state agencies, and compliance with regulations at both levels is required in order for child-care facilities to be reimbursed for the foods and beverages they serve to children. In response to growing public concern for the weight-related health of children, the Healthy, Hunger-Free Kids Act of 2010 included language requiring that federal regulations addressing CACFP meal patterns be updated to better align with the Dietary Guidelines for Americans. The recently released final rule, which targets full implementation by October 2017, includes new regulations designed to promote weight-related health by increasing children’s intake of a variety of fruits and vegetables, whole grains, and water; reducing children’s intake of sugar and fat; promoting family-style meals; avoiding the use of food or beverages for behavioral management; and encouraging the provision of breast milk for infants.

The Head Start Program was also established by federal legislation and, since its inception in 1965, has provided comprehensive early learning services to children from low-income families. Nearly 1 million US children from birth to age 5 years are enrolled in the program annually, which is administered by the Department of Health and Human Services through approximately 50,000 classrooms, home-based programs, and family child-care partners. To further improve the quality of Head Start and eliminate disparities in educational achievement, it was mandated by the Improving Head Start for School Readiness Act of 2007 that federal performance standards be updated without eliminating or reducing health, educational, parental involvement, nutritional, social, or other services in quality or scope. Federal rules describing the updates were published recently and most revised provisions became effective in November 2016. The new performance standards specify that nutrition services must be culturally and developmentally appropriate, require that safe drinking water be available to children, and place increased emphasis on the requirements for programs to communicate and collaborate with parents in regard to their children’s health. In addition, the new standards clarify or add to requirements for programs to provide parents with opportunities for learning about healthy pregnancy and postpartum care; facilitate access to nutrition counseling for enrolled pregnant women; engage in a home visit with enrolled mothers within 2 weeks of her child’s birth; and establish within 30 days whether children have an appropriate source of ongoing care and health insurance coverage, including efforts to inform parents of opportunities to access health insurance. The updated language encourages the practice of having family-style meals and recognizes meal times are important opportunities for children to learn about food and nutrition, but the requirement for this practice was removed to better allow for collaborating with community partners like schools. New language was also added with regard to the importance of physical activity. The revised performance standards prohibit using physical activity as a reward or punishment and require programs to integrate intentional movement and physical activity into curricular activities and daily routines without setting a specific amount of time that children should engage in physical activity.

The latest revisions to CACFP regulations and federal performance standards for Head Start Programs will need to be evaluated throughout the process of implementation to ensure that changes lead to improvement on the demonstrated benefits of the current programs. Existing research suggests that child-care facilities enrolled in CACFP, and particularly Head Start Programs, tend to provide environments more supportive of healthy eating than facilities that do not participate, but little is known about the incorporation of children’s cultural food preferences as part of the healthy choices provided. At least seven studies have described CACFP facilities or compared CACFP facilities to facilities that do not participate with a focus on the nutritional quality of foods and beverages provided to children, making water easily available to children, nutrition education, mealtime behaviors of child-care providers, and perceived barriers to making changes to strengthen obesity prevention efforts (Table 3). In addition, there is evidence from related studies suggesting facilities enrolled in CACFP are more likely to fully implement new state regulations and local health codes designed to promote better diets, facilities that receive higher reimbursement rates provide more nutrient-dense foods and beverages, and children who attend enrolled facilities have better weight-related outcomes. An example of research that has investigated the supports for healthy eating provided by CACFP involved a total of 429 licensed child-care providers in California, including 303 providers employed by an enrolled facility. The providers were selected to represent six types of care environments for children ages 2 to 5 years, including Head Start Programs,
### Table 3. Federal policies and regulations that protect the most vulnerable infants, toddlers, and preschoolers

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<th>Author(s), year, reference</th>
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<th>Measures of support for weight-related behavior&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Results</th>
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<tr>
<td>Liu and colleagues, 2016&lt;sup&gt;b&lt;/sup&gt;</td>
<td>229 child-care centers and homes in a large Midwestern city and its suburbs</td>
<td>Cross-sectional survey data were collected by mail in spring 2011</td>
<td><strong>Dietary intake and physical activity:</strong> Survey measures assessed opportunities for physical activity, available play equipment, types of food served, and staff/provider practices and policies related to nutrition and physical activity</td>
<td>A higher proportion of CACFP facilities reported offering whole-grain foods daily and that providers always eat the same foods that are offered to the children. CACFP facilities had 1.1 times as many supportive nutrition practices as non-CACFP facilities. CACFP participation was not associated with written policies or physical activity practices.</td>
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<tr>
<td>Blaine and colleagues, 2015&lt;sup&gt;51&lt;/sup&gt;</td>
<td>29 child-care centers employing 166 participating care providers for infants and toddlers in the greater Boston, MA area</td>
<td>Cross-sectional survey data were collected in spring 2009 as part of the baseline assessment for the Baby Nutrition and Physical Activity Self-Assessment for Child Care study</td>
<td><strong>Dietary intake:</strong> Survey measures assessed six feeding practices addressing the provision of a variety of nutritious foods and being responsive to children’s hunger and fullness cues</td>
<td>Providers at CACFP-participating centers were more likely to sit with children at meals. Providers at CACFP-participating centers were also more likely to offer fruits and vegetables daily and limit children’s access to fast food.</td>
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<tr>
<td>Schwartz and colleagues, 2015&lt;sup&gt;52&lt;/sup&gt;</td>
<td>38 randomly selected CACFP-participating child-care centers in Connecticut</td>
<td>Trained observers assessed lunch consumption for an average of 5 children (ages 2.5 to 5.7 y) per center</td>
<td><strong>Dietary intake:</strong> Comparison of food and nutrient intake with current and proposed CACFP guidelines (as of January 2015) and 2011 recommendations made by the National Academy of Medicine</td>
<td>Lunches were generally in compliance with current CACFP regulations but did not align with the National Academy of Medicine recommendations. The nutrient content of meals was low in vitamin B-6, vitamin C, vitamin E, folate, potassium, and fiber; high in protein, sodium, and saturated fat; and appropriate for energy. Only two centers served 100% whole-grain bread. Children consumed more produce when centers served both fruit and vegetables in alignment with the proposed rule.</td>
</tr>
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<sup>a</sup> Measures of support for weight-related behavior include dietary intake, physical activity, and program policies.
Table 3. Federal policies and regulations that protect the most vulnerable infants, toddlers, and preschoolers (continued)

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<th>Author(s), year, reference</th>
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<tr>
<td>Tovar and colleagues, 2015</td>
<td>105 randomly selected family child-care home providers in Rhode Island (39% Hispanic, 43% non-Hispanic white)</td>
<td>Cross-sectional survey data were collected in 2012 by calling providers and asking them to complete a phone-based, online, or paper survey</td>
<td>Dietary intake: Survey measures addressed attitudes and practices relating to nutrition training, child feeding practices and attitudes, and parental involvement</td>
<td>No observed differences in provider practices according to CACFP participation</td>
</tr>
<tr>
<td>Dev and colleagues, 2014</td>
<td>118 child-care providers from 24 center-based programs (6 Head Start, 11 CACFP funded, and 7 non-CACFP) located in a three-county diverse geographic area in the Midwest</td>
<td>Self-administered survey data was collected in 2011-2012</td>
<td>Dietary intake: Survey measures addressed 7 feeding practices, including modeling, teaching about nutrition, child control, pressure to eat, restriction, restriction for health, and restriction for weight control</td>
<td>Working in a Head Start center predicted teaching children about nutrition and modeling healthy eating No differences were found by provider type in use of controlling feeding practices</td>
</tr>
<tr>
<td>Ritchie and colleagues, 2012</td>
<td>Licensed child-care providers in California were selected to represent diverse care environments for children ages 2 to 5 y; 303 CACFP providers and 126 non-CACFP providers participated</td>
<td>Care providers completed self-administered surveys by mail in 2008 (31% response)</td>
<td>Dietary intake and water consumption: Types of foods and beverages served to children on the day before the survey Availability of self-serve water</td>
<td>CACFP sites were more likely as compared to non-CACFP sites to serve milk, meats, and vegetables other than fried potatoes. CACFP sites were less likely to serve sweetened drinks or juice and provided fewer sweets and snack-type foods (including frozen desserts, candy, sweet cereals, other sweet baked goods, regular potato chips, and other snack foods) to children at snack time. CACFP sites were less likely to serve water at meals and snacks but more often reported having water easily available inside for children to serve themselves. Differences between CACFP sites and non-CACFP sites were found for 10 of 26 feeding practices examined. CACFP sites were more likely to allow children involvement in determining what to eat, the order in which to eat, and how much to eat. A higher proportion of CACFP sites reported using family-style meal service, having staff sit at the table with children, providing children with child-size pitchers, and talking about the food at mealtimes.</td>
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<tr>
<td>Sigman-Grant and colleagues, 2011</td>
<td>Licensed child-care centers in California, Colorado, Idaho, and Nevada that enrolled low-income families and served meals to children ages 2 to 5 y; 93 CACFP providers and 110 non-CACFP providers participated</td>
<td>Care center directors and staff completed self-administered surveys in 2003 (41% response)</td>
<td>Dietary intake: Survey measures assessed mealtime environments, staff feeding behaviors, and related attitudes, beliefs, and practices</td>
<td>(continued on next page)</td>
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### Table 3. Federal policies and regulations that protect the most vulnerable infants, toddlers, and preschoolers (continued)

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<tr>
<td><strong>Head Start Programs</strong></td>
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<tr>
<td>Hughes and colleagues, 2010&lt;sup&gt;19&lt;/sup&gt;</td>
<td>A national sample of 1,583 Head Start programs participated between February and April 2008 as part of the Study of Healthy Activity and Eating Practices and Environments in Head Start (SHAPES)</td>
<td>Cross-sectional design; mailed surveys and phone interviews were primarily completed by program directors with assistance from health/nutrition specialists, education specialists, and other staff members</td>
<td><strong>Dietary intake and physical activity:</strong> Perceived barriers to obesity prevention efforts experienced at the program level, staff level, and parent level Challenges to obesity prevention</td>
<td>Nearly one-third of directors reported that their programs would not experience any challenges if they tried to provide meals and snacks that were healthier than the ones they were currently providing Similarly, nearly one-fifth of directors reported their program would not experience any barriers to increasing gross motor activity Lack of money was among the most common barriers to serving healthy meals and snacks (51%) and increasing physical activity opportunities (42%). Staff not liking the taste of healthier foods and parental knowledge and attitudes were among the most prevalent barriers to healthy eating</td>
</tr>
<tr>
<td>Whitaker and colleagues, 2009&lt;sup&gt;20&lt;/sup&gt;</td>
<td>National sample of 1,583 Head Start programs</td>
<td>Self-administered survey data was collected from program directors in 2008</td>
<td><strong>Dietary intake and physical activity:</strong> survey measures assessed practices and environments related to healthy eating (eg, foods and beverages served, written feeding guidelines, available nutrition curriculum) and physical activity (eg, presence of play equipment, outdoor play area, limiting screen time)</td>
<td>Most Head Start programs report doing more to support healthy eating than required by federal performance standards With regard to the types of foods and beverages served: 70% served only nonfat or 1% milk; 94% reported that each day they served children some fruit other than 100% fruit juice; 97% reported serving some vegetable other than fried potatoes; 66% celebrated special events with healthy foods or nonfood treats; 54% did not allow vending machines for staff</td>
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<sup>a</sup>The focal weight-related behavior that was studied is shown in bold type.

<sup>19</sup>CACFP = Child and Adult Care Food Program.
state preschools, other centers enrolled in CACFP, non-CACFP centers, family child-care homes participating in CACFP, and non-CACFP child-care homes. Results based on self-administered surveys showed that CACFP facilities were more likely as compared to non-CACFP facilities to serve milk and vegetables other than fried potatoes and were less likely to serve sugar-sweetened drinks. The CACFP facilities were also found to serve fewer sweets and snack-type foods (eg, frozen desserts, candy, sweet baked goods, and potato chips) to children at snack time. Although CACFP facilities were less likely to serve water at meals and snacks, providers representing CACFP facilities were more likely to report having water easily available inside for children to serve themselves.

There is also emerging evidence that demonstrates Head Start Programs provide environments supportive of healthy eating and physical activity (Table 3), and that these programs help to reduce overweight and obesity among enrolled children. For example, a 2008 national survey of Head Start Program directors found that more than half of programs (56%) provided children with at least 30 minutes per day of structured (adult-led or adult-guided) gross motor activity and at least 60 minutes per day of unstructured gross motor activity. It was also found that most (89%) programs had an on-site play area at every center and 77% of programs without an on-site outdoor play area at every center reported that all of their centers had access to an off-site play area within walking distance. Another evaluation of Head Start Programs addressed rates of overweight and obesity among children ages 2 to 5 years who were enrolled at 12 Head Start programs in Michigan between 2005 and 2013 (n=19,023) and comparison groups of children who were insured by Medicaid or a private plan (n=24,725). Outcomes based on measurements of height and weight were analyzed separately for children who entered Head Start at a weight classified as overweight or obese and for children who had entered Head Start at a healthy weight. The results showed that children who were overweight or obese at the time of Head Start Program entry exhibited a significant decline in body mass index z score over the first academic year and, at the end of the observation period, also had a lower mean body mass index z score than comparison group children. At the end of the observation period, children who were at a healthy weight at the time of Head Start Program entry also had a mean body mass index z score that was similar to that of children in the Medicaid group, but greater than that of children in the non-Medicaid group.

**Differences in the Practices and Policies of Licensed Child-Care Facilities**

A small number of studies have addressed how the environments of child-care facilities may differ according to urban/rural location and the demographic characteristics of providers, enrolled children, or the local community. In addition, four descriptive studies have provided detailed information about the environments provided by caregivers of a specific ethnic/racial background or located in a rural area. The existing research addresses only licensed providers and focuses on the nutritional quality of foods and beverages provided to children, mealtime behaviors of child-care providers, supports for breastfeeding, supports for physical activity, provider training, and parental involvement (Table 4). Findings to date suggest it will be important for more representative studies to evaluate differences in child-care environments and qualitative research to identify unique barriers that may influence the environments provided by ethnically/racially diverse providers and providers located in rural areas.

**Nutritional Quality of Foods and Beverages.** Five of the studies identified for this review addressed the nutritional quality of foods and beverages provided to toddlers and preschoolers while they are attending a child-care facility. Three of these studies examined statistical differences according to geographic location; one study examined differences according to the ethnic/racial composition of enrolled children and providers, and one study provided a detailed description of the foods and beverages served in rural child-care centers. The results suggest several opportunities exist for improving the nutritional quality of meals and snacks provided to children in rural areas; however, statistically significant differences in the nutritional quality of foods and beverages provided to children were observed only according to the ethnic/racial composition of children. The descriptive study examined as part of this review involved interviews with employees at 29 child-care centers located in low-income, rural communities across seven north central states. Less than half of these rural child-care centers reported consistently implementing the recommended practices to serve a variety of vegetables; offer more whole grains; offer a variety of fruits; offer foods low in saturated fat; avoid sugary, fatty, and salty foods; and celebrate holidays with mostly healthy snacks or without snacks. With regard to ethnic/racial differences, a study conducted in Boston among infant and toddler care providers showed that centers serving a majority of nonwhite children (>60%, primarily black, African American, or Hispanic) were more likely to limit the service of food from fast-food restaurants, but were no more likely to offer fruits and vegetables daily or avoid serving sugary foods and desserts to children.

**Mealtime Behaviors of Child-Care Providers.** Seven of the studies identified for this review addressed feeding practices and other mealtime behaviors of care providers for toddlers and preschoolers. Five of these studies examined statistical differences according to characteristics of the facility or provider; and two other studies provided detailed descriptions of factors that may influence the eating behaviors of children enrolled at centers located in rural communities and directed by Latino providers. The existing literature provides little evidence for differences according to geographic location in mealtime behaviors; however, potentially important differences were identified according to the ethnic/racial composition of enrolled children and characteristics of providers. For example, one study reported on 29 child-care centers in Boston and 166 ethnically/racially diverse providers that completed survey measures about their feeding behaviors. The results showed centers employing white providers as compared to African-American or Latino providers were more likely to let children leave food unfinished and, similarly, providers that completed education beyond high school were more likely to...
Table 4. Patterns in the practices and policies of US child-care facilities according to area population density, socioeconomic markers, and ethnic/racial minority composition

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<td><strong>Comparative studies</strong></td>
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<tr>
<td>Garth and colleagues, 2016</td>
<td>47 child-care centers in the Center City and West Philadelphia neighborhoods of Philadelphia, PA, that enrolled children before age 18 mo</td>
<td>Phone interviews with center directors were conducted in March to May 2015 (response rate: 43% for Center City, 24% for West Philadelphia)</td>
<td>Practices supportive of breastfeeding</td>
<td>The community of West Philadelphia (79% black, 35% living below poverty line) is more racially diverse and has fewer resources as compared to Center City (14% black, 16% living below poverty line) A higher proportion of child-care centers in Center City as compared to centers in West Philadelphia encouraged mothers to visit and breastfeed during the day (80% vs 69%) A higher proportion of child-care centers in West Philadelphia as compared to centers in Center City reported cue-based feeding (87% vs 73%) and proper milk labeling procedures (91% vs 80%) A higher proportion of child-care centers in West Philadelphia were prepared to refer families to breastfeeding support services (47% vs 33%) and provided staff with training on the benefits of breastfeeding (50% vs 20%)</td>
</tr>
<tr>
<td>Tovar and colleagues, 2015</td>
<td>105 randomly selected family child-care home providers in Rhode Island (39% Hispanic, 43% non-Hispanic white)</td>
<td>Cross-sectional survey data were collected in 2012 by calling providers and asking them to complete a phone-based, online, or paper survey (43% response rate)</td>
<td>Dietary intake: Survey measures addressed attitudes and practices relating to nutrition training, child feeding practices and attitudes, and parental involvement</td>
<td>Hispanic providers as compared to non-Hispanic providers reported receiving more nutrition training during the past 3 y and were more likely to find the training very helpful Hispanic providers were more likely to report sitting with children during snacks and meals and report encouraging children to finish food on their plate Hispanic providers were more likely to strongly agree it is important to communicate with families regarding nutrition and felt more comfortable in passing information on to parents and families about good nutrition practices Hispanic providers were more often comfortable discussing a child’s weight problem with parents or families</td>
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Table 4. Patterns in the practices and policies of US child-care facilities according to area population density, socioeconomic markers, and ethnic/racial minority composition (continued)

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<tr>
<td>Blaine and colleagues, 2015&lt;sup&gt;23&lt;/sup&gt;</td>
<td>29 child-care centers employing 166 participating care providers for infants and toddlers in the greater Boston, MA area</td>
<td>Cross-sectional survey data were collected in spring 2009 as part of the baseline assessment for the Baby Nutrition and Physical Activity Self-Assessment for Child Care study</td>
<td><strong>Dietary intake:</strong> Survey measures assessed six feeding practices addressing the provision of a variety of nutritious foods and being responsive to children’s hunger and fullness cues</td>
<td>Centers serving a majority of nonwhite children were more likely to limit the service of fast food to infants and toddlers. When compared to African-American or Latino providers, white providers were more likely to let children leave food unfinished. Providers with a high school education or less were less likely to feed children only when hungry.</td>
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<tr>
<td>Frampton and colleagues, 2014&lt;sup&gt;24&lt;/sup&gt;</td>
<td>83 all-day child-care centers (34 urban, 49 rural) providing care for children 2 to 5 y in Oklahoma</td>
<td>Spring 2012 cross-sectional phone survey and review of lunch menus (5 days selected from monthly or cycle menus) provided by the center director</td>
<td><strong>Dietary intake:</strong> Meeting DRI&lt;sup&gt;b&lt;/sup&gt; for children 1 to 3 y and for children 4 to 8 y was determined based on provision of at least one third of the daily value</td>
<td>Although rural child-care centers tended to provide slightly more of each nutrient than urban child-care centers, there were no statistically significant differences identified. Urban centers provided less folate than the DRI for children ages 4 to 8 y, but rural center menu values were not statistically different from the DRI.</td>
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<tr>
<td>Sisson and colleagues, 2012&lt;sup&gt;25&lt;/sup&gt;</td>
<td>314 licensed, all-day child-care centers providing care for children ages 2 to 5 y in Oklahoma; sampling was stratified to represent all six geographic regions of the state</td>
<td>Center directors or delegates were asked to complete a survey by mail in the fall of 2010</td>
<td><strong>Dietary intake and physical activity:</strong> Survey measures were drawn from the Nutrition and Physical Activity Self-Assessment for Child Care</td>
<td>There was no discernible pattern of differences in the use of nutrition best practices according to region. Central Oklahoma and Tulsa regions reported lower frequencies of some physical activity best practices.</td>
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<sup>a</sup> Measures of support for weight-related behavior include survey measures assessing feeding practices addressing the provision of nutritious foods and being responsive to children’s hunger and fullness cues. 

<sup>b</sup> DRI: Daily Reference Intake.
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<td>Freedman and Alvarez, 2010</td>
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<tr>
<td>72 child-care providers (59% Hispanic, 22% Asian, 14% white, 4% other) working in center-based and family home settings and caring for children ages 6 mo to 5 y</td>
<td>Providers completed written surveys as part of a 2008 class on the division of feeding responsibility</td>
<td>Dietary intake: Survey measures assessed attitudes and practices relating to child feeding practices</td>
<td>Differences in the prevalence of child feeding practices were related to the ethnic/racial background and educational attainment of providers. Compared to providers with less education, those who reported at least some college education were more likely to eat meals together with children. Hispanic providers were less likely to eat with children compared to those who reported their ethnicity/race as Asian or white. Compared to Asian and white providers, Hispanic providers were also more likely to report making children eat foods they think are good for them, only cooking foods they knew children liked, insisting children finish their food before they leave the table, not allowing children to eat less than they thought they should, and not allowing children to eat more than they thought they should.</td>
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<tr>
<td>Whitaker and colleagues, 2009</td>
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<tr>
<td>1,583 Head Start programs representing a national sample</td>
<td>Program directors were asked to complete a survey by mail or phone during the period February to April 2008</td>
<td>Dietary intake and physical activity: Survey measures assessed the presence of practices and environmental features related to healthy eating (scored out of 15 total) and gross motor activity (scored out of 15 total)</td>
<td>In the full national sample, the mean (standard deviation) healthy eating and gross motor scores were 11.8 (2.0) and 11.2 (2.1), respectively. Healthy eating and activity scores were not related to rural vs urban location or the educational attainment of teachers.</td>
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<td>Lindsay and colleagues, 2015</td>
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<td>44 licensed Latino family child-care home providers in Massachusetts</td>
<td>Purposive sampling was used to identify participants and six focus groups were conducted in Spanish</td>
<td>Dietary intake and physical activity: Guided discussions addressed providers’ beliefs and practices relating to nutrition, feeding practices, physical activity, and sedentary behaviors</td>
<td>Providers were aware of their potential to influence the eating and physical activity behaviors of preschool children in their care. The majority of providers reported participating in workshops about nutritional guidelines. Several barriers and challenges to establishing healthy behaviors were identified: high cost of healthy foods, cold weather, parents allowing children to bring electronics to daycare, limited space for physical activity in their home, and worries about parents being upset by a discussion of their child’s weight status.</td>
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<td>Tovar and colleagues, 2015&lt;sup&gt;28&lt;/sup&gt;</td>
<td>30 Hispanic providers of home-based childcare for children ages 2 to 5 y in Rhode Island</td>
<td>Four focus-group discussions were conducted in Spanish</td>
<td><strong>Dietary intake and physical activity</strong>: Guided discussions explored perceptions regarding what influences a child’s physical activity, sedentary time, and dietary behaviors while under their care</td>
<td>The selection of foods served to children was influenced by state rules and regulations, cultural preferences, and training in feeding practices. Commonly reported feeding practices included serving mostly starchy foods (e.g., crackers, granola bars) for snacks, serving homemade sweetened drinks (e.g., morir soñando), spoon feeding children perceived to not be eating enough, and acting on the belief children needed to be larger to be healthy. Several parental behaviors and attitudes were perceived as barriers to healthy practices: parents dropping off children with unhealthy foods and tablets, telling providers they did not want their child taken outside in colder weather, and worries about child injuries. To better promote healthy weight-related behaviors, providers reported needing more age-appropriate equipment for indoor play, additional training, discount coupons for healthy foods, and strategies for communicating with parents.</td>
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<tr>
<td>Hesketh and colleagues, 2015&lt;sup&gt;70&lt;/sup&gt;</td>
<td>29 child-care centers and 203 participating providers that were caring for ethnically and racially diverse infants and toddlers (&gt;50% nonwhite) in the greater Boston, MA area</td>
<td>Cross-sectional survey data were collected in spring 2009 as part of the baseline assessment for the Baby Nutrition and Physical Activity Self-Assessment for Child Care study</td>
<td>Survey measures assessed providers’ perceptions of their role in supporting <strong>physical activity</strong>, their own physical activity level, and their beliefs about physical activity in infants and toddlers.</td>
<td>The majority of providers perceived they had a role in supporting the physical activity of infants and toddlers in their care, but 23% believed they had limited responsibility for this role. Nearly 3 in 4 providers believed that physical activity could prevent excess weight gain in infants and toddlers; however, toddler providers were more likely to have this perception than infant providers. The majority of providers indicated that infants require less than 1 h of physical activity per day and only 30% of providers accurately indicated that toddlers require at least 90 min of activity per day.</td>
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<td>Foster and colleagues, 2015&lt;sup&gt;3&lt;/sup&gt;</td>
<td>29 child-care centers serving preschool children in low-income, rural communities across seven North Central states</td>
<td>Interviews were conducted with at least one employee at each child-care center site</td>
<td><strong>Dietary intake and physical activity:</strong> Interview questions assessed the physical environment, promotion efforts, and nutrition and physical activity policies; implementation was defined by policies being always or almost always enforced.</td>
<td>Less than half of the sites consistently offered a variety of vegetables; attempted to offer more whole grains; offered a variety of fruits; offered foods low in saturated fat; avoided sugary, fatty, and salty foods; and celebrated with snacks that were mostly healthy or without snacks. Although all sites met income eligibility for the CACFP, less than half were participants. Less than half of sites reported that children accumulated a daily minimum of 60 min of physical activity and included planned and structured staff-led physical activity or physical activity intended to develop motor skills. More than 25% of centers reported no parental outreach on topics related to child nutrition, physical activity, healthy home environments, or referrals to nutrition assistance programs.</td>
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<tr>
<td>Rosenthal and colleagues, 2013&lt;sup&gt;71&lt;/sup&gt;</td>
<td>17 licensed, family child-care providers in metropolitan Connecticut who were caring for children ages 6 wk to 9 y; 94% were caring for children paying with a state subsidy</td>
<td>In-person interviews were conducted with providers between March 2005 and March 2006</td>
<td><strong>Dietary intake and physical activity:</strong> Interview questions assessed providers’ perceptions of important aspects of their role in prevention suboptimal weight trajectories, their responsibility for health promotion, and their success and challenges in health promotion. Providers perceived they had a personal responsibility in obesity prevention. Providers described three core strategies, including: 1) improving children’s nutritional intake and physical activity behavior (encouraging dramatic play), 2) engaging and educating parents (sharing actual food and techniques they use to encourage children), and 3) leveraging influences external to their relationship with parents to effect positive change and avoid parental conflict (such as discussing CACFP guidelines with parents).</td>
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<sup>a</sup>The focal weight-related behavior that was studied is shown in bold type.
<sup>b</sup>DRI=Dietary Reference Intakes.
<sup>c</sup>CACFP=Child and Adult Care Food Program.
feed children only when they were hungry.51 The descriptive studies examined as part of this review identified additional aspects of feeding that should be examined to build understanding of potential reasons for certain practices (eg, concerns about food security, cultural beliefs) along with their prevalence of use within more representative samples of child-care facilities and providers. One illustrative report on focus-group discussions with Hispanic providers of home-based child care described the positive impact that nutrition-related training had on their feeding behaviors, but noted many providers who were concerned with a child not eating enough food would “help” the child eat by spoon-feeding them at snacks and meals.68 A descriptive study of rural, low-income child-care centers found that a substantial proportion of these facilities did not consistently provide children with more than 20 minutes to slowly eat and enjoy their food and some facilities did not discourage the use of foods as a reward or punishment.64

**Supports for Breastfeeding.** The only study found in this review to address differences in forms of supports for breastfeeding was conducted in a sample of 47 child-care centers in two distinct communities of Philadelphia.69 Child-care centers that enrolled children before the age of 18 months were recruited from Center City (n = 15) and West Philadelphia (n = 32). In Center City, 14% of the residents identified as black or African American and 16% had incomes below the poverty line. In contrast, 79% of residents identified as black or African American and 35% had incomes below the poverty line in West Philadelphia. Child-care center directors were interviewed by phone about the training provided to staff, center policies, and services provided to families in support of breastfeeding. Statistical testing was not reported by the study, but potentially meaningful differences were identified in the practices reported by child-care providers in these two areas of Philadelphia. A greater proportion of facilities within the higher-income community of Center City supported breastfeeding by encouraging mothers to visit and breastfeed during the day. Conversely, a number of other supportive practices, such as training staff on the benefits of breastfeeding, following proper milk labeling procedures, and being prepared to refer families to breastfeeding support services were reported by a greater proportion of facilities within the lower-income community of West Philadelphia.

**Supports for Physical Activity.** Six of the studies identified for this review addressed supports for physical activity.53,60,63,65,67,70 Two of these studies examined statistical differences according to geographic location,60,65 and the remaining studies provided detailed descriptions of factors that may influence the physical activity behaviors of infants, toddlers, or preschoolers enrolled in child-care centers located in rural communities or serving ethnically/racially diverse children.53,63,67,70 The existing literature does not provide evidence of differences according to urban vs rural geographic location in the supports that child-care facilities provide for physical activity. A large number of practices and program-level policies were examined by the two relevant studies that conducted statistical testing, but it is noteworthy that these studies are limited in generalizability.60,65 One involved a statewide investigation of child-care centers in Oklahoma and the other national investigation focused solely on Head Start programs. The descriptive studies examined as part of this review identified aspects of support for physical activity that should be examined as part of comparative studies and within more representative samples of child-care facilities, but suggest that additional culturally relevant training and other supports tailored to the needs of providers in rural areas may be needed to guide them in helping children to meet recommendations for physical activity and developing motor skills.53,63,67,70 For example, one study that interviewed employees of 29 child-care centers located within low-income, rural communities found that less than half of the facilities reported providing planned and structured staff-led physical activity, physical activity intended to develop traveling motor skills, physical activity intended to develop stabilizing motor skills, or physical activity intended to develop manipulating motor skills.63

**Provider Training and Parental Involvement.** In addition, six of the studies identified for this review addressed how providers communicate with or involve parents and providers’ completion of training related to nutrition and physical activity.53,63,67,69,71 One of these studies examined statistical differences relating to the ethnic background of the provider53 and the remaining studies provided detailed descriptions of efforts to build knowledge regarding supports for nutrition or physical activity behaviors of children enrolled in child-care centers located in low-income areas, in rural communities, or directed by a provider representing a nonwhite ethnic/racial group.63,67,69,71 For example, one study involved the collection of survey data in a sample of 105 randomly selected family child-care home providers in Rhode Island and differences were examined according to the identified ethnic background of providers.53 Hispanic providers as compared to non-Hispanic providers reported receiving more nutrition training over a 3-year period and were more likely to report the perception this training was helpful. This same study further examined communication with parents and families, and found Hispanic providers were both more likely to agree that it is important to share information regarding nutrition and feel comfortable discussing a child’s weight problem with their family. With regard to geographic location, the one study that focused on child-care centers in low-income, rural communities did not address provider training, but reported more than one in four centers had made no attempt to reach out to parents on topics relating to child nutrition, physical activity, healthy home environments, or nutrition assistance programs.63

**IMPLICATIONS FOR PRACTICE AND FUTURE RESEARCH**

This review aimed to summarize existing research on child-care settings of relevance to weight-related health among vulnerable US populations of young children. The review found there is a growing body of evidence addressing disparities in the social and physical child-care environments provided for young children, but scientific gaps exist in the current knowledge base relating to how resources should best be allocated and policies designed to promote health equity. Registered dietitian nutritionists and other stakeholders can use the existing science summarized here to inform the design of future research to fill these gaps, build
understanding of disparate findings, and advocate for necessary resources, such as support for surveillance of child-care practices and policies. Additional research is needed to address limitations of prior studies relating to the measurement of supports for weight-related health; complexities of categorizing socioeconomic position, ethnicity/race, and urban and rural areas; exclusion of legally nonlicensed care settings from most research; and the cross-sectional nature of most study designs.

Although a small number of tools have been developed and tested for assessing environmental supports for healthy eating and activity in child-care settings, more work is needed to establish a commonly accepted framework and set of tools for assessing differences across settings that serve ethnically/racially, socioeconomically, and geographically diverse families. Ecological frameworks exist that may be applied for guiding research on the numerous factors that influence food choices and physical activity, including frameworks that emphasize the influence of child-care environments and may serve as a useful starting place for making refinements to focus on disparities. The integration of a life-course approach, as described previously, could provide useful guidance for making such refinements and ensuring attention is paid to equity issues and key influences of relevance at each stage of early development. For example, it may be helpful for a commonly accepted guiding framework to address the provision of technical assistance that is tailored to the culture of a child-care provider and the community they serve (eg, culturally defined perceptions of health and body image). In addition, the need for identifying unequal impacts of policies and programs designed to promote healthy food and activity choices could be highlighted by a framework that shows the cycle of implementation, evaluation, and making improvements.

The development of a guiding framework that addresses equity issues would further help to build on existing initiatives and shape the design of strong surveillance systems to allow for better monitoring and evaluation of state policies that may impact weight-related aspects of child-care environments, implementation at the program level, and needed implementation supports. Despite increased attention over the past decade on the role of child-care settings in obesity prevention, this review identified only a small number of studies that have responded to previous calls for conducting surveillance and monitoring the potential impact of policies and programs on weight-related disparities. One example of a recent initiative that was not identified by the peer-reviewed literature search has involved assessing the extent to which states with a Quality Rating and Improvement System are using various linked strategies (eg, encouraging use of a self-assessment tool) to support child-care providers in implementing healthy eating and physical activity practices. The Nemours Foundation has also published a workbook for child-care programs to guide providers in drafting written policies around healthy eating and physical activity and monitoring progress toward implementation. There is a great need for surveillance systems to build on these initial efforts and allow for linking improvements in child-care environment supports for healthy eating and physical activity to changes in children’s weight status, body fat, dietary patterns, feeding and motor skills, outdoor play time, and screen time.

With few exceptions, the literature on child-care environments has focused on licensed facilities; existing work points to a particular need for research to explore the impact of policies and regulations on legally nonlicensed providers of child care and the supports these caregivers provide for breastfeeding, healthy eating, and physical activity. Legally nonlicensed caregivers provide the most common form of nonparental child care in the United States and strategies for supporting these caregivers needs to be informed by research relating to what barriers they face, what forms of training and other resources are available to them, and what additional resources they may need. The Informal Caregivers Research Project has begun to build the evidence base in describing the perceived challenges and existing support networks of legally unlicensed caregivers in California. Similar research with a focus on weight-related health is needed across the United States to extend the findings and establish the generalizability of these initial research efforts.

It will be critical for future research to address the potential for policy actions to have negative consequences for informal child-care arrangements and more broadly for the well-being of child-care providers and the ability of families to access affordable and culturally relevant sources of care. Child-care providers often face multiple challenges (eg, long hours, high levels of stress) to maintaining their own well-being; it will be important to ensure that policy actions do not add to these challenges and instead provide support for overcoming them so providers can focus on their efforts to provide high-quality care for children. Further, there is an ongoing need for research to evaluate the impact of updates to federal regulations for the CACFP and performance standards for Head Start on weight-related disparities and the health of vulnerable infant and child populations. Evaluations should address the potential for policy actions to have unintended consequences for children’s weight-related health. As most research to date has been cross-sectional, there is a particular need for prospective studies to ensure that policy changes produce and sustain equitable improvements in the weight-related health of young people.

References


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STATEMENT OF POTENTIAL CONFLICT OF INTEREST

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