

# Comparative Evaluation of a South Carolina Policy to Improve Nutrition in Child Care



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## ARTICLE INFORMATION

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## ABSTRACT

**Background** Policies to promote healthy eating in young children appear promising, but are largely untested. Recently, South Carolina implemented mandatory nutrition standards governing child-care centers serving low-income children.

**Objective** This study evaluated consistency with the standards before and after the policy took effect.

**Design** This study evaluated consistency with the nutrition standards in South Carolina, using North Carolina—a state not making policy changes—as the comparison. The research team conducted assessments in a longitudinal sample of centers and a cross-sectional sample of children before and approximately 9 months after the standards took effect.

**Participants/setting** Trained observers recorded foods and beverages served to 102 children from 34 centers in South Carolina and 90 children from 30 centers in North Carolina at baseline. At follow-up, the research team observed 99 children from 33 centers in South Carolina and 78 children from 26 centers in North Carolina.

**Intervention** The policy was implemented in April 2012 and included 13 standards governing the nutritional quality of foods and beverages served to children, and staff behaviors related to feeding children in care.

**Main outcome measures** The outcome was consistency with each standard at follow-up in South Carolina compared with North Carolina, controlling for baseline consistency and other covariates.

**Statistical analyses performed** Logistic regressions were conducted to evaluate consistency with each standard, adjusting for baseline and potential confounders.

**Results** Compared with North Carolina, centers in South Carolina were more likely to be consistent with the standard prohibiting the use of food as a reward or punishment (odds ratio=1.22; 95% CI 1.11 to 1.61;  $P=0.03$ ). Two centers in South Carolina met all 13 standards at follow-up compared with none in North Carolina. No other differences were observed.

**Conclusions** New standards modestly improved nutrition practices in South Carolina child-care centers, but additional support is needed to bring all centers into compliance with the current policies.

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CHILD CARE OUTSIDE OF THE HOME HAS BECOME increasingly prevalent in the United States, with >60% of children older than 3 years of age in regular care.<sup>1</sup> Children in full-time child care may consume more than half of their daily calories while in care,<sup>2-4</sup> demonstrating the potential influence of child care on children's overall diet quality. Previous studies suggest that children who attend child care might be more likely to be overweight or obese later in childhood than children cared for at home by a parent.<sup>5-10</sup> Thus, child care has become an important target for intervention.

The Institute of Medicine recently put forth recommendations for policy-based initiatives to help prevent obesity in early childhood, emphasizing the importance of promoting healthy eating within child-care settings.<sup>2</sup> These policy-based

obesity-prevention efforts targeting young children appear promising. Recent studies have evaluated state-level policies to create healthier environments for children, but these have focused primarily on older children within school settings.<sup>11-18</sup> Taber and colleagues<sup>15</sup> found that adoption of US Department of Agriculture's nutrition standards for school meals was associated with lower weight status among children. Kubik and colleagues<sup>17</sup> examined state-level nutrition policies targeting school vending machines and school stores and found that schools with policies offered fewer foods of low nutritional value. Ohri-Vachaspati and colleagues<sup>18</sup> found that participation in the US Department of Agriculture's Fresh Fruit and Vegetable Program was associated with greater availability of fruit during school lunches. In one previous study of child-care centers, Lessard and colleagues<sup>19</sup>

evaluated compliance with nutrition regulations in New York City. They found that >80% of centers were compliant with the regulations governing the type of milk and juice served and limiting sugar-sweetened beverages. But just over half of centers were consistent with the regulation restricting the amount of juice served to children and requiring the availability of water.<sup>19</sup> However, the cross-sectional design of these studies and, in many cases, the lack of a comparison group do not allow for inferences about the temporal relationships between policy change and health outcomes. Few studies have prospectively evaluated the effects of state-level policy change on nutrition outcomes, and even fewer have focused on the child-care setting. Recently, South Carolina enacted nutrition standards for child-care centers serving low-income children throughout the state. The purpose of this study was to measure the extent to which centers were consistent with the new standards in South Carolina, using North Carolina as the comparison state.

## MATERIALS AND METHODS

### Study Overview

To evaluate consistency with the standards, the researchers conducted a study with a two-group pretest/post-test design using North Carolina (a state not making policy changes) as the comparison. We assessed consistency with the standards in both states before and after the standards took effect and hypothesized that South Carolina centers would show greater consistency with the new standards at follow-up compared with North Carolina centers. The Institutional Review Boards of the University of South Carolina in South Carolina and Duke University in North Carolina approved this study and all adult participants provided written informed consent.

### Nutrition Standards

In April 2012, South Carolina implemented 13 nutrition standards through the ABC Child Care Program, a statewide initiative to provide subsidized child care to families in need. To be eligible for the program, families must have incomes below 150% of the federal poverty level. Centers not participating in the ABC Child Care Program were not eligible to participate in the study because these centers were not a target of the new standards. South Carolina uses the term *standards* rather than *regulations* because the policy change was administrative and not through the state legislature. However, the standards are compulsory; centers not adhering could face citations for noncompliance. Although the new standards were implemented in April 2012, centers had until October 2012 to comply. The nutrition standards applied to toddlers and preschoolers in care (not infants) and targeted beverages, fruits and vegetables, whole grains, other foods (eg, sweets), and policies and practices within the centers.

### Study Participants

A total of 34 centers were enrolled in the Columbia, SC, area and 30 centers in the Raleigh, NC, area based on power calculations to determine sample size. Centers were eligible to participate if they were classified by the state as a center and not a family child-care home. Because South Carolina centers participating in the ABC Child Care Program served low-income families, centers in North Carolina also needed to

serve low-income families by accepting state subsidies to make the samples more comparable. Centers were excluded if they had an open case of abuse or neglect on file with either state. The researchers worked with the state child-care licensing agency to generate a list of eligible centers. The study team mailed letters of invitation to all 174 eligible centers in South Carolina and 168 centers in North Carolina and enrolled the first 30 centers that agreed to participate. Interest was high in South Carolina and the researchers enrolled four additional centers above the target. The study team obtained written and informed consent from each center director at all centers in both states. Trained data collectors observed all foods and beverages served to a cross-sectional sample of 102 children in South Carolina centers and 90 children in North Carolina centers (3 children per center) before the standards took effect and 99 children in South Carolina centers and 78 children in North Carolina centers at follow-up. We did not collect any identifying information about the children in care. Parents were informed of the study, but did not provide consent for mealtime observations.

### Data Collection

To assess consistency with the standards, center observations were conducted before the implementation of the standards and approximately 9 months after the standards took effect (past the point of mandatory compliance in South Carolina) using the Environment and Policy Assessment and Observation<sup>20</sup> and Diet Observation in Child Care.<sup>21</sup> The Environment and Policy Assessment and Observation assesses child-care nutrition environments, policies, and practices; the protocol and information about inter-rater reliability are reported elsewhere.<sup>20</sup> Consistent with the published protocol, training for Environment and Policy Assessment and Observation included a 1-day workshop, 2 days of field practice in a child-care center, and a final certification test over 1 day in a child-care center. Data collectors needed to achieve 85% agreement with the gold standard trainer in order to be certified to conduct the Environment and Policy Assessment and Observation. The Diet Observation in Child Care was designed to assess foods and beverages served to three children in child-care settings and has demonstrated moderate to high reliability and validity.<sup>21</sup> Per protocol, training for the Diet Observation in Child Care included 56 hours of practice measuring and visually estimating food and beverage portions in an office or laboratory setting, a mock meal observation, and 2 days of practice in a child-care center. To be certified, the three data collectors (one in South Carolina and two in North Carolina) needed to achieve at least 80% agreement with the actual measured portion for at least 90% of food and beverage items on a 20-food test. Additional details about Environment and Policy Assessment and Observation and Diet Observation in Child Care training and certification have been published previously.<sup>20,21</sup>

Data collectors randomly selected one classroom within the center, and then three children within the classroom for dietary observation via the Diet Observation in Child Care. They recorded all foods and beverages served to children. Because the team was interested in center-level and not child-level information, cross-sectional assessments were conducted at baseline and follow-up. Thus, the same children

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