Nutrition Education in US Elementary Schools: Policies Matter

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1. Introduction

Recent data indicate that in the United States (US), 32.6% of elementary-school-aged children—those ages 6 to 11 years old—are obese or overweight [1]. Schools play a key role in shaping children's dietary intake habits and the school environment is an important focus for childhood obesity prevention efforts [2]. The US Centers for Disease Control and Prevention (CDC) recognizes the key role that schools play in addressing childhood obesity and recommends that schools provide a Coordinated School Health Program that includes nutrition education as a key component [3,4]. Furthermore, according to a report by the Institute of Medicine, school-based health education helps to encourage physical activity and healthy eating among students [2]. Interventions that promote significant changes in student behavior and weight outcomes generally involve comprehensive multi-component interventions; however, some interventions have significantly reduced rates of obesity among students through an educational curriculum alone [5]. Although middle schools and high schools provide health education through topic-specific courses, nutrition education at the elementary school level typically occurs as part of the curriculum for the entire grade. In a 2006 survey, the CDC found that 85 percent of elementary schools required students to be taught about nutrition and dietary behavior in at least some courses or grades, but elementary schools dedicated a median of only 3.4 hours of instruction per year to nutrition education [6].

Federal legislation in the US required all school districts participating in the National School Lunch Program and other meals programs (i.e., the vast majority of school districts) to adopt and implement a wellness policy by the first day of the 2006–07 school year. These policies were to include goals for nutrition education, which most have done [7]. In addition, some school districts have addressed nutrition education curricula in their wellness policies, but few have strong policies in place. At the beginning of the 2006–07 school year, only 35 percent of public elementary school students were enrolled in a district with a wellness policy that required a specific nutrition education curriculum [7].

The purpose of the current study was to examine the prevalence of formal classroom instruction on nutrition education in elementary schools, as reported by school principals, and to examine the association between school practices and corresponding district policies. It was hypothesized that nutrition education would be more common in schools where the district policy required a nutrition education curriculum for every grade.

2. Methods

2.1 Study Design

Data were gathered via an annual study on health-related practices in public elementary schools and districts. Analyses used cross-sectional survey data from nationally representative samples of schools during the 2007–08, 2008–09 and 2009–10 school years. All research protocols and survey materials were approved by the Institutional Review Board at the University of Illinois at Chicago.

2.2 School-Level Data Collection

Surveys were mailed to each school with a request that the survey be completed by the principal. Surveys were gathered during the second half of each school year—January to June—and a $100 incentive was offered to the respondent. Response rates and number of responding schools over the three years were: 70.6% (748 schools); 61.8% (641 schools); and 64.5% (680 schools).

Analyses used a single item about nutrition education. The lead-in asked respondents "At present, is formal classroom education offered to elementary school students in your school on nutrition education?" Response options were no, yes, and don't know. For analyses, "yes" was coded = 1, "no" was coded = 0 and "don't know" was treated as missing.

2.3 Sampling and Weighting

The school samples were developed at based on datasets from the National Center for Education Statistics (NCES). Because elementary schools vary in grade composition (e.g., Kindergarten to third grade, second to fifth grade), all schools were required to include third grade. Public schools from all contiguous US states were eligible for sampling. School weights were adjusted for potential non-response bias by modeling every school's propensity to respond..

2.4 Contextual Factors

To control for school-level factors that could confound the association between district policies and school practices, data were obtained from the public-use NCES datasets for each survey year. Data were obtained on the total number of students in the school; the percentage of students eligible for free or reduced-price lunch; student race/ethnicity; U.S. census region; and locale.

2.5 District-Level Policy Collection

Formal policy documents (e.g., policy manuals and wellness policies as mandated by the *Child Nutrition and WIC Reauthorization Act of 2004* were collected from the corresponding school district for each elementary school in the sample, for the corresponding year of data collection. Policies were gathered by trained research assistants using an established protocol via internet searches, with telephone calls and/or mailings to find policies that were unavailable online and to verify complete policy collection for policies that were available online.

All district policies were reviewed, double-coded and analyzed by two trained researchers using an adaptation of a coding scheme developed by Schwartz et al. [8] and presented in Chriqui et al. [7,9]. After double-coding was complete, a consensus review was conducted to discuss any discrepancies. For the current analyses, one policy provision was examined, pertaining to whether the district had a nutrition curriculum for each grade level. Policies were coded as "1" where the policy required a nutrition education curriculum for every grade versus "0" if nutrition education was not addressed in the policy, there was only a general health curriculum, or if nutrition education was offered but not for every grade level.

2.6 State-Level Policy Collection

State laws were obtained through primary legal research [10], using keyword searches of the state law databases commercially available via subscription from Westlaw and Lexis-Nexis. Additionally, the statutory indices and the table of contents for the statutes and administrative laws for each state were reviewed to ensure complete capture from the keyword searches. All state laws were reviewed and double-coded. Coding for state laws was the same as for district policies, regarding the presence of a strong law requiring a specific nutrition education curriculum for every grade.

2.7 Statistical Analysis

Analyses were conducted in STATA/SE v10.1 and accounted for sampling stratum and clustering of schools within districts.

A multivariate logistic regression model was calculated with the outcome of whether the school provided formal classroom instruction on nutrition education. District policy requiring a nutrition education curriculum was included as a predictor, along with year and demographic covariates. All variables were entered simultaneously into the models.

3. Results

The characteristics of schools in the sample were comparable across years (Table 1), and approximately three-fourths of schools provided formal classroom instruction on nutrition education.

Table 1. Characteristics of Participating Elementary Schools and Prevalence of Nutrition Education

	2007-08	2008-09	2009-10
	% of schools		
SCHOOL CHARACTERISTICS			
Race/Ethnicity of Students			
Majority (>66%) White students	50.5	47.3	47.4
Majority (>50%) Black students	10.0	11.6	12.1
Majority (>50%) Latino students	15.9	16.4	15.3
Diverse	23.6	24.7	25.2
US Region			
Northeast	17.1	16.9	16.9
Midwest	25.8	25.1	25.1
South	34.4	35.0	35.0
West	22.7	23.0	23.0
Locale			
City	29.9	32.7	29.9
Suburb	32.6	30.2	34.7
Town	11.5	12.3	9.6
Rural	26.0	24.7	25.8
NUTRITION EDUCATION			
School offers nutrition education	73.7	74.6	70.1

Note: Percentages sum to 100 within category, but some may not sum to exactly 100 due to rounding.

The percentages of districts with a policy requiring nutrition education for every grade was, respectively, across the three years: 37.5%, 39.8% and 41.3% of districts; a chi-square test indicated that this did not differ

significantly across time. In 2007-08, 57.4%)of the states where at least one school returned the survey (47 of the 50 US states) had a law requiring nutrition education curricula; this did not change over time.
As shown in Table 2, nutrition education was more common where the district policy required it for every grade (Odds Ratio = 1.44, p < .01). Across the three years, 70.1% of schools in a district without a policy offered nutrition education, compared with 75.5% of schools in a district with a policy (data not shown in tables). The logistic regression model also showed that nutrition education was more common in smaller schools, and less common in suburban versus urban schools, and in schools with a majority of Black students versus those with a majority of White students.

Table 2. Results of Logistic Regression Model to Predict Nutrition Education in Elementary Schools

	Classroom Instruction on Nutrition Education	
	Odds Ratio	**95% C.I.**
District Policy	1.43**	1.10, 1.87
State Law	1.05	0.76, 1.44
Year		
2007-08	ref	
2008-09	1.13	0.86, 1.48
2009-10	0.87	0.66, 1.14
Locale		
City	Ref	
Suburb	0.71*	0.52, 0.97
Town	0.76	0.49, 1.17
Rural	0.78	0.52, 1.16
Race/Ethnicity		
Majority White	ref	
Majority Black	0.56*	0.34, 0.94
Majority Latino	1.25	0.81, 1.93
Diverse	0.99	0.70, 1.39
School Size		
Largest	ref	
Medium	0.82	0.66, 1.18
Smallest	1.41*	1.05, 1.91
SES		
Highest	ref	
Medium	0.82	0.59, 1.13
Lowest	0.70	0.46, 1.07
Region		
South	ref	
Northeast	1.02	0.67, 1.54
Midwest	0.89	0.59, 1.34
West	0.76	0.50, 1.17

* p < .05, ** p < .01

4. Conclusions

Respondents at most US public elementary schools participating in this survey project reported that their school provided formal classroom instruction regarding nutrition; however, one in four schools did not. Given the importance of nutrition education for providing children with the knowledge and skills to make healthy dietary choices, nutrition education should be part of every child's academic experience.
Regressions controlling for school characteristics and year showed that district policy was associated with practice, and schools located in a district that had a strong policy requiring a nutrition education curriculum in every grade were 44% more likely to offer nutrition education. Because the data are cross-sectional within each year, we cannot conclude that district policies caused the schools to offer nutrition education, only that policy is associated with school practice. However, these results suggest that a potential strategy for changing school practices is to strengthen district policies. Assisting schools with policy implementation (e.g., providing lesson plans, curricula, and other resources) could improve nutrition education in schools.

Strengths of this study include the large, nationally-representative sample spanning multiple school years. However, there are also several limitations; as with all surveys, it is possible that the estimates were biased (e.g., desirability bias, non-response bias), but the weights were adjusted to account for non-response. We did not assess the type, amount, or quality of nutrition education offered, which would be an important goal for future research.

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