



Disparities Persist in Nutrition Policies and Practices in Minnesota Secondary Schools



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ABSTRACT

Access to healthy foods among secondary school students is patterned by individual-level socioeconomic status, but few studies have examined how school nutrition policies and practices are patterned by school-level characteristics. The objective of our study was to examine school nutrition policies and practices by school characteristics (eg, location, racial/ethnic composition, and free/reduced priced lunch eligibility) in Minnesota secondary schools between 2008 and 2012. Data from the 2008 to 2012 Minnesota School Health Profiles survey were used to assess school nutrition policies and practices, and National Center for Educational Statistics data were used for school characteristics (n=505 secondary schools). Nutrition policies and practices included the availability of low-nutrient, energy dense (LNE) items, strategies to engage students in healthy eating, and restrictions on advertisements of LNE products in areas around the school. Among school-level characteristics, school location was most strongly related to school nutrition policies. Across all years, city schools were less likely than town/rural schools to have vending machines/school stores (prevalence difference [PD] -13.7, 95% CI -25.0 to -2.3), and less likely to sell sport drinks (PD -36.3, 95% CI -51.8 to -20.7). City schools were also more likely to prohibit advertisements for LNE products in school buildings (PD 17.7, 95% CI 5.5 to 29.9) and on school grounds (PD 15.6, 95% CI 1.7 to 29.5). Between 2008 and 2012, the prevalence of some healthy eating policies/practices (eg, limiting salty snacks, offering taste testing, and banning unhealthy food advertisements in school publications) declined in city schools only, where these policies/practices had previously been more common. Monitoring of these trends is needed to understand the influence of these policies on student outcomes across school settings.

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RATES OF OBESITY FOR ALL US ADOLESCENTS HAVE been rising for more than 3 decades¹ and are disproportionately higher among some populations. Racial/ethnic minority youth are more likely to be overweight or obese compared with non-Hispanic white youth,¹⁻⁵ and youth from low-income households are more likely to be overweight or obese compared with those from higher-income households.^{2-4,6} Disparities in obesity extend to geography as well, with children in rural areas more likely to be obese or overweight than urban children.^{7,8}

Obesity also clusters according to school characteristics. Secondary schools with high minority enrollment or low mean parental education have students with disproportionately higher body mass index, and schools located in nonmetropolitan areas have a high proportion of students who are obese.⁹ More research is needed to examine how youth obesity may be patterned by school characteristics,¹⁰ beyond family, peer, and neighborhood influences.^{11,12}

School nutrition and physical activity policies may contribute to patterns in adolescent obesity rates.^{9,13} Specific policy solutions for reducing obesity include regulating the food environment by restricting competitive food and

fundraiser sales,¹⁴⁻¹⁶ using price incentives and other strategies to engage students in healthy eating,^{13,17,18} and eliminating advertisements for unhealthy products in schools.^{13,19} School policies related to the availability of healthy food are a plausible mechanism by which disparities in obesity and related health behaviors might arise. However, little is known about how policies and practices vary at the school level by geography, socioeconomic status, and racial and economic composition of students at the school.¹³

To fill this gap, we examined policies and practices that may improve the school food environment and promote healthy eating by school characteristics. Our aim was to explore differences in the prevalence of nutrition policies and practices in Minnesota secondary schools by racial/ethnic composition of the student body, free/reduced price lunch eligibility, and school location between 2008 and 2012.

METHODS

The study was part of the School Obesity-Related Policy Evaluation study, which aimed to evaluate nutrition and physical activity policies and practices in Minnesota

secondary schools; it was approved by the Institutional Review Board at the University of Minnesota. Data on school nutrition policies and practices were obtained from the 2008 to 2012 Minnesota School Health Profiles principal survey²⁰ administered by the Minnesota Department of Education with funding and technical assistance from the Centers for Disease Control and Prevention. This survey is a random, biennial, self-administered assessment that is mailed to school principals or designees. Between 2008 and 2012, the response rate for principals ranged from 70% to 84%.²⁰ For this study, three policy and practice areas were assessed: the availability of low-nutrient, energy-dense (LNE) snacks, implementation of strategies to promote healthy eating at school, and banning advertisements for LNE foods.²¹ Profile questions for these policies and practices were the same in all study years.

Availability of LNE Foods

Principals were asked: “Can students purchase any snack foods or beverages from one or more vending machines at the school or at a school store, canteen, or snack bar?” If yes, they were asked whether students could purchase each of the following items: a) soda pop or fruit drinks that are not 100% juice; b) sport drinks (eg, Gatorade, PepsiCo); c) chocolate candy or other kinds of candy; and d) salty snacks that are not low in fat. Response options were yes or no.

Strategies to Engage Students in Healthy Eating

Principals were asked: “During this school year, has your school done any of the following? a) Priced nutritious foods and beverages at a lower cost while increasing the price of less-nutritious foods and beverages; b) collected suggestions from students, families, and school staff on nutritious food preferences and strategies to promote healthy eating; c) provided information to students or families on the nutrition and caloric content of foods available; d) conducted taste tests to determine food preferences for nutritious items; and e) provided opportunities for students to visit the cafeteria to learn about food safety, food preparation, or other nutrition-related topics.” Response options were yes and no.

Banning Advertisements for LNE Foods

Principals were asked: “Does your school prohibit advertisements for candy, fast-food restaurants, or soft drinks in the following locations? a) in the school building; b) on school grounds, including on the outside of the school building, on playing fields, or other areas of the campus; c) on school buses or other vehicles used to transport children; d) in school publications (eg, newsletters, newspapers, websites, or other school publications).” Response options were yes or no.

National Center for Educational Statistics (NCES) Common Core Data²² were used to characterize schools. High schools were defined as those with a low grade of ninth grade or higher and a high grade of 10th grade or higher. Junior/senior high schools had a low grade of eighth grade or lower and a high grade of 10th grade or higher. Schools with no grade below fifth grade and no grade above ninth grade were classified as middle schools. Other school characteristics included the percent of minority (nonwhite and/or Hispanic) enrollment in three categories (<5%, 5% to 50%, or ≥50%), percent student free/reduced price lunch (FRPL) eligibility in

three categories (<20%, 20% to <60%, or ≥60%), and school location in three categories (city, suburban, and town/rural). School location was determined using a combination of NCES and Rural-Urban Commuting Areas classification schemes.^{22,23} School-level data for 2012 are based on 2011 NCES data.

The associations among school characteristics and nutrition policies and practices were estimated across years (2008, 2010, or 2012). Characteristics examined included school location (with town/rural as the reference group), FRPL eligibility categories (with <20% FRPL as the reference group), and minority enrollment categories (with <5% minority enrollment as the reference group) using generalized estimating equation models with a robust unstructured correlation structure, binomial distribution and logit link. All models included school level (ie, middle, junior/senior high, or high school) to account for the stratified sampling scheme. A Taylor series expansion was used to obtain the standard error (and 95% CI) for adjusted prevalences and adjusted prevalence differences (PD) from the logistic regression models. All models included location, FRPL eligibility, and minority enrollment, also adjusted for school level and year. Interactions were tested between year and school location, FRPL eligibility, and minority enrollment and estimated adjusted PD (95% CI) stratified by year when significant interactions were found. This modeling strategy allowed us to identify trends over time and differences by school characteristics across years. Analyses were conducted in Stata statistical software (version 12.1, 2011, StataCorp).

RESULTS AND DISCUSSION

School Characteristics

Table 1 presents school characteristics from 2008 to 2012 for schools included in the analysis. The analysis included 505 unique schools (some schools were part of the sample in >1 year). The sample was equally divided between high schools, junior/senior high schools, and middle schools. In all years, at least two-thirds were rural or small town schools. Few schools (<10%) had more than half minority enrollment and all of these schools were located in a city. FRPL eligibility was more variable; in most of the schools, 20% to 60% of students were eligible. The unadjusted prevalence of each school policy or practice from 2008 to 2012 according to each school characteristic, including the availability of LNE items, healthy eating strategies, and banned ads for LNE items are presented in Figures 1, 2, and 3, respectively (available online at www.andjrn.org).

Average Prevalence Differences in Policies by School Characteristics

Differences in the adjusted prevalence of school policies and practices by school location and FRPL eligibility are presented in Table 2. Differences were averaged across all years (2008, 2010, and 2012) unless there was a statistically significant interaction between year and either school location or FRPL eligibility, in which case differences are presented in each year. Across all years, on average, city schools were less likely than town/rural schools to have vending machines or school stores (PD –13.7, 95% CI –25.0 to –2.3), and less likely to sell sport drinks (PD –36.3, 95% CI –51.8 to –20.7). City schools were also more likely to ban advertisements for LNE

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