



# School-Based Obesity-Prevention Policies and Practices and Weight-Control Behaviors among Adolescents



Nicole Larson, PhD, MPH, RDN; Cynthia S. Davey, MS; Caitlin E. Caspi, ScD; Martha Y. Kubik, PhD, MSN, RN; Marilyn S. Nannery, PhD, MPH, RD

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## ABSTRACT

**Background** The promotion of healthy eating and physical activity within school settings is an important component of population-based strategies to prevent obesity; however, adolescents may be vulnerable to weight-related messages, as rapid development during this life stage often leads to preoccupation with body size and shape.

**Objective** This study examines secular trends in secondary school curricula topics relevant to the prevention of unhealthy weight-control behaviors; describes cross-sectional associations between weight-related curricula content and students' use of weight-control behaviors; and assesses whether implementation of school-based obesity-prevention policies/practices is longitudinally related to students' weight-control behaviors.

**Design** The Minnesota School Health Profiles and Minnesota Student Survey (grades 9 and 12) data were used along with National Center for Education Statistics data to examine secular trends, cross-sectional associations ( $n=141$  schools), and longitudinal associations ( $n=42$  schools).

**Main outcome measures** Students self-reported their height and weight along with past-year use of healthy (eg, exercise), unhealthy (eg, fasting), and extreme (eg, use laxatives) weight-control behaviors.

**Statistical analyses performed** Descriptive statistics, generalized estimating equations, and generalized linear regression models accounting for school-level demographics.

**Results** There was no observable pattern during the years 2008 to 2014 in the mean number of curricula topics addressing unhealthy weight-control behaviors, despite an increase in the prevalence of curricula addressing acceptance of body-size differences. Including three vs fewer weight-control topics and specifically including the topic of eating disorders in the curricula was related to a lower school-level percent of students using any extreme weight-control behaviors. In contrast, an overall measure of implementing school-based obesity-prevention policies/practices (eg, prohibited advertising) was unrelated to use of unhealthy or extreme behaviors.

**Conclusions** Results suggest obesity-prevention policies/practices do not have unintended consequences for student weight-control behaviors and support the importance of school-based health education as part of efforts to prevent unhealthy behaviors. *J Acad Nutr Diet.* 2017;117:204-213.

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THE CHILD NUTRITION AND WIC REAUTHORIZATION Act of 2004 (S.2507) established a requirement for each school district participating in a federally sponsored child nutrition program to develop and implement a wellness policy by the 2006-2007 school year.<sup>1</sup> During the past decade, this legislation has directed greater attention from the public and school professionals to weight and related behaviors in the school environment. The attention that has focused on promoting healthy nutrition and physical activity behaviors in schools is an important

component of public health strategies to prevent obesity; however, adolescent students may be vulnerable to messages about weight, as the rapid growth and development that occur during this life stage often lead to preoccupation with body size and shape.<sup>2</sup> Excessive concerns with body size or shape may further lead young people to engage in unhealthy weight-control behaviors, such as skipping meals or taking diet pills.<sup>3,4</sup>

Given the potentially severe medical and psychosocial consequences associated with engaging in unhealthy weight-control behaviors,<sup>5</sup> there is a need for knowledge of what efforts are being taken by schools to prevent these behaviors and whether the efforts are effective. Research concerning school health education and the weight-related content of the curricula is lacking, particularly with regard to school-level demographic disparities, how the curricula provided by schools may have changed over time in response to obesity-prevention efforts, and linkages to students' weight-control behaviors. Likewise, little is known about linkages between the implementation of school-based obesity-prevention efforts and student weight-control behaviors. A search of the scientific literature identified only one previous study that has examined how state-level obesity-prevention policies are related to adolescents' use of unhealthy weight-control behaviors and reported a mixed pattern of findings<sup>6</sup>; no previous studies addressing the potential unintended consequences of school- or district-level wellness policies were found. Additional research is needed to ensure school-based obesity-prevention efforts do not have unintended consequences and all young people receive educational messages that will help to prevent unhealthy weight-control behaviors.

The current study was designed to help fill these identified research gaps using data on public secondary schools in Minnesota. The first aim was to describe school-level demographic differences and secular patterns (2008 to 2014) in curricula addressing the prevention of unhealthy weight-related behaviors. The second aim was to describe associations between the weight-related content of school health education curricula and students' weight-control behaviors. In addition, a third aim was to assess whether the implementation of evidence-based school policies and practices designed to prevent obesity during the period from 2008 to 2010 was longitudinally related to school-level prevalence of student weight-control behaviors from 2007 to 2010.

## METHODS

### Data and Sample

The analyses described here were conducted as part of the larger School Obesity-related Policy Evaluation (ScOPE) study, which aims to evaluate food and activity policy and practice environments in Minnesota secondary schools and examine relationships with the behaviors and weight status of students.<sup>7</sup> The ScOPE study was approved by the University of Minnesota's Institutional Review Board. Data for the analysis to be described here were drawn from existing data sets: Minnesota School Health Profiles teacher survey, 2008-2014<sup>8</sup>; Minnesota School Health Profiles principal survey, 2008-2010<sup>8</sup>; Minnesota Student Survey, 2007-2010<sup>9</sup>; and National Center for Educational Statistics (NCES) Common Core Data, 2008-2014.<sup>10</sup> The Minnesota School Health Profiles

is a survey of school health policies and practices sponsored by the Centers for Disease Control and Prevention. The Profiles teacher survey includes an assessment of the health topics taught to students in required courses, and the principal survey includes an assessment of student access to competitive foods; opportunities for physical activity; exposure to strategies designed to promote healthy food and beverage selection; and exposure to advertising for energy-dense, nutrient-poor foods and beverages. In Minnesota, mailed Profiles questionnaires were collected biennially from a representative sample of public middle, junior/senior high, and high schools; written consent was not collected for teachers or principals, as the Profiles surveys were designed to collect information about school environments and not individuals. The Minnesota Student Survey assesses aspects of students' diets along with a broad range of health behaviors, and is sponsored jointly by the Minnesota Departments of Education, Health, Human Services, and Public Safety.<sup>9,11</sup> All regular schools in the state were invited to participate and, within participating schools, all students enrolled in grades 9 and 12 were invited to complete the classroom-administered survey items addressing weight-control behaviors in 2007 and 2010. Students were given the opportunity to assent if they were present on the day of the survey and their parent did not return a form indicating refusal to have their child participate. An introductory script informed students that participation in the Minnesota Student Survey is voluntary, they could skip any question(s) they did not want to answer, and they could stop at any time; assent by student participants was indicated by completion of the survey. Across the state in 2007, approximately 76% of students in grade 9 and 58% of students in grade 12 participated.<sup>12</sup> Similarly, in 2010, approximately 75% of students in grade 9 and 59% of students in grade 12 participated.<sup>12</sup> The NCES Common Core Data is the Department of Education's primary database on public schools in the United States and is updated annually. Additional details of the measures drawn from each survey are described, including the psychometric properties of scales and scores based on the analytic sample specific to the relevant time points and school grade levels.

### Minnesota School Health Profiles Teacher Survey Measures

To assess attention to weight-related health in the curricula, health education teachers were asked whether students in any of grades 6 through 12 in their school were taught the following topics as part of a required course: "risks of unhealthy weight control practices"; "accepting body size differences"; and "signs, symptoms, and treatment for eating disorders." Yes/no responses were summed to form a score that demonstrated high internal consistency among schools included in the final analytic sample (Cronbach's  $\alpha=0.85$ ; range=0 to 3; mean $\pm$ standard deviation [SD]=2.72 $\pm$ 0.76 for all secondary schools in 2014).

### Minnesota School Health Profiles Principal Survey Measures

**Availability of Competitive Foods.** Principals were asked several questions relating to the availability of competitive foods. The presence of competitive foods was assessed (yes/no) by asking whether students could purchase snack foods

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