

Children's School-Related Food and Physical Activity Behaviors Are Associated with Body Mass Index

Tracy C. Vericker, PhD

ARTICLE INFORMATION

Article history:

Accepted 22 July 2013

Available online 24 October 2013

Keywords:

School food environment
School physical activity environment
Competitive food and beverages
Body mass index (BMI)

Copyright © 2014 by the Academy of Nutrition and Dietetics.

2212-2672/\$36.00

<http://dx.doi.org/10.1016/j.jand.2013.07.046>

ABSTRACT

Childhood obesity is a critical public health issue, with prevalence rates reaching nearly one in five children. Schools may be a promising public policy intervention point. The foods schools sell and the physical activity environments they foster can influence dietary behaviors and overall physical activity. Using secondary data from a nationally representative sample of children from the kindergarten class of 1998-1999 and nonexperimental methods, this study examines the associations between the food and physical activity environments in school and body mass index (BMI) for low-income boys and girls in the 8th grade during 2007. Results reveal that participating in school sports is associated with a 0.55 lower BMI score for boys. For low-income girls, eating the school breakfast is associated with a 0.70 higher BMI score and eating the school lunch is associated with a 0.65 higher BMI score. Each hour spent on homework is associated with a 0.02 higher BMI score for low-income girls. These findings suggest that schools may influence adolescent BMI and that there is room for improvement in school food and physical activity environments to promote healthier weights for low-income boys and girls.

J Acad Nutr Diet. 2014;114:250-256.

OBESITY, A LEVEL OF BODY FATNESS ASSOCIATED with poor health outcomes, has become a serious public health concern in the United States for adults and children. In 2010, 16.9% of children were obese.¹ The costs of obesity, both public and private, are high: obesity-related medical expenditures alone may have cost as much as \$147 billion in 2008 dollars.² As a result, public policy leaders have begun to take action to diagnose and remediate the problem.

Children spend about one third of their wakeful day in school, making schools a promising policy intervention point.³ School food and physical activity environments may be contributing to poor habits, resulting in an increase in the prevalence of childhood obesity. Schools may contribute to inactivity by focusing less on physically active time at school.⁴ Poor dietary habits may be promoted by offering food options that do not conform to current dietary recommendations and standards set forth by federal regulation for the school breakfast program (SBP) and national school lunch program (NSLP).⁵ Unhealthy foods and beverages offered outside the federally reimbursable meals through à la carte options, vending machines, or other sources in the school (ie, competitive foods and beverages) may also contribute to poor eating habits.⁵

A growing body of literature examines the relationship between aspects of the school food and physical activity environments and children's weight, but its findings are mixed. Concerning competitive foods, some research suggests that access to unhealthy competitive foods and beverages in schools is associated with weight gain⁶ and the

probability of becoming overweight or obese,⁷ some research shows no relationship,^{8,9} and some research finds limited evidence of a relationship.¹⁰

The literature is similarly inconsistent about the roles the school meal programs and physical activity in school play in determining children's weight. Some research suggests that the NSLP is positively associated with increased body mass index (BMI)¹¹ and obesity,^{12,13} whereas other research finds no association between school lunch participation and BMI.¹⁴ Some research finds evidence that the SBP protects against obesity,¹³ whereas other research finds that SBP participation is associated with an increase in BMI.¹¹ Several studies have found that requiring physical education in school is associated with lower BMI,^{15,16} whereas other work finds no relationship.¹⁷ Other research has linked school sports participation with a lower risk of becoming overweight.¹⁸

Although inconsistent, these findings suggest that the school food and physical activity environments play at least some role in students' weight status. Whereas many of the aforementioned studies focus on one aspect of the school food or physical activity environments for all children, this study looks comprehensively at multiple aspects of the school environment, assessing which features may hold the most promise for reducing obesity among low-income children. By examining school policies comprehensively, this study is able to hold constant certain aspects while examining others. This study specifically focuses on low-income children, among whom obesity is more prevalent than moderate- to higher-income children.¹⁹

Table 1. Control variables included in regression models that assess the relationship between school food and physical activity environments and body mass index for low-income boys and girls in the 8th grade during 2007^a

Control variable	Boys (n=730)	Girls (n=820)
Demographic characteristics of child and household		
Race/ethnicity of child (%)		
White ^b	46.2	44.0
Black	21.9	25.1
Hispanic	26.0	21.9
Other	6.0	9.0
Mean age (mo)	171.6	171.8
Low birth weight (%)	7.6	8.0
Disabled (%)	25.2	17.1
Parent is native-born (%)	79.1	78.1
Two-parent household (%)	55.6	58.9
Parent employed full time (%)	76.8	79.0
Highest educational attainment of parents (%)		
Less than high school ^b	15.1	13.0
High school	36.8	30.6
Technical school/some college	35.2	41.4
Bachelor's degree or higher	12.8	15.0
Household size (mean)	4.7	4.7
Household lives below the federal poverty level (%)	40.5	41.5
Parent has experienced depressive symptoms (%)	48.8	52.4
Parent in fair/poor health (%)	19.7	19.6
Child psychosocial characteristics		
Internalizing problems scale ^c (mean)	2.0	2.1
Self-concept scale ^d (mean)	4.0	3.9
Locus of control scale ^e (mean)	2.8	2.9
Interaction with friends scale ^f (mean)	11.0	10.9
Spends time alone at home every day (%)	15.6	16.2
Family stress (mean)		
No. of stressful events occurring in previous year ^g	1.3	1.3
Characteristics of child's school and neighborhood		
Rural (%)	32.7	32.3
County unemployment rate (mean)	4.9	4.8
Attends public school (%)	96.9	97.3

(continued)

Table 1. Control variables included in regression models that assess the relationship between school food and physical activity environments and body mass index for low-income boys and girls in the 8th grade during 2007^a (continued)

Control variable	Boys (n=730)	Girls (n=820)
Parent chose child's school (%)	14.6	16.6
No. of years testing done in school (mean)	3.7	3.8
Child diet and exercise behaviors		
Participates in nonschool sports (%)		
Rarely or never ^b	27.8	41.8
<1 time/wk	11.4	20.2
1-2 times/wk	19.1	22.5
Almost every day or every day	41.7	15.4
Screen time (mean h/wk)	20.1	15.2
Reading outside school (mean h/wk)	2.9	3.9
Ate fast food during the past 7 d (%)	73.2	77.1
Body mass index (mean)		
5th grade	20.9	21.1

^aData are from the Early Childhood Longitudinal Study, Kindergarten Class of 1998-1999²¹ and Bureau of Labor Statistics 2007 Local Area Unemployment Statistics.²² Tabulations are weighted to be representative of all children attending kindergarten during the 1998-1999 school year. Sample sizes are unweighted and are rounded to the nearest 10 per National Center for Education Statistics data security guidelines. Low-income is defined as having household income roughly at or below 200% of the federal poverty level.

^bIndicates reference group in the multivariate models.

^cIncludes 8 items representing a child's experience with sadness, loneliness, and anxiety. The scale ranges from 1-4, with higher values indicating more internalizing behaviors.

^dIncludes 7 items with a range of 0-6. Higher scores indicate more positive self-concept.

^eIncludes 6 items with a range of 0-5. Higher scores indicate a greater perception of control over one's own life.

^fIncludes 4 items measuring amount of time spent interacting with friends. The scale ranges from 0-16, with higher scores indicating more time spent with friends.

^gIncludes 8 items with a range of 0-8. Higher scores indicate more stressful events experienced.

METHODS

Design and Sample

Guiding this research is the socioecological theory of obesity causation, which maintains that individual behaviors, genetic predispositions, and physical and social environments affect health outcomes.²⁰ Specifically, this study estimates the relationship between child BMI and the school physical activity environment, student school-related physical activity choices, the school food environment, and student participation in the federal school meals programs.

This nonexperimental study examined 8th-graders living in low-income households in 2007 who attended schools that offered the NSLP. Low income was defined as having an annual household income roughly at or below 200% of the federal poverty level. Analyses were conducted separately for 730 boys and 820 girls. The Urban Institute Institutional Review Board approved this study.

Download English Version:

<https://daneshyari.com/en/article/5869688>

Download Persian Version:

<https://daneshyari.com/article/5869688>

[Daneshyari.com](https://daneshyari.com)