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Youth Access to School Salad Bars in the United States—2011 to 2014

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Abstract

Purpose—To examine differences in students' access to school salad bars across sociodemographic groups and changes in availability over time.

Design—Nonexperimental.

Setting—Nationally representative 2011 and 2014 YouthStyles surveys.

Participants—A total of 833 (2011) and 994 (2014) US youth aged 12 to 17 years.

Measures—Youth-reported availability of school salad bars.

Analysis—Multivariable logistic regression models were used to assess differences in school salad bar availability by socio-demographics and changes in availability from 2011 to 2014.

Results—Youth-reported salad bar availability differed by age in 2011 and race/ethnicity in 2014, but not by sex, income, metropolitan residence, or region in either year. Salad bars were reported by 62% of youth in 2011 and 67% in 2014; the increase was not statistically significant ($P = .07$). Significant increases from 2011 to 2014 were noted among youth aged 12 to 14 years (56%–69%; $P < .01$), youth of non-Hispanic other races (60%–85%; $P < .01$), and youth in the Midwest (58%–72%; $P = .01$).

Conclusion—These results suggest that youth-reported access to school salad bars does not differ significantly across most sociodemographic groups. Although overall salad bar availability did not increase significantly from 2011 to 2014, some increases were observed among subgroups. Continued efforts to promote school salad bars through initiatives such as Let's Move Salad Bars to Schools could help increase access for the nearly one-third of US youth reporting no access.

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Authors' Note

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Declaration of Conflicting Interests

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Keywords

schools; nutrition; salad bars; adolescent; lunch

Purpose

Fruit and vegetable consumption has been associated with a decreased risk of several chronic diseases¹ and may contribute to weight management by replacing energy-dense foods in the diet.² However, in 2007 to 2010, 93% of youth aged 1 to 18 years did not meet the US Department of Agriculture (USDA) Food Patterns vegetable consumption recommendations, and 60% did not meet USDA's fruit consumption recommendations.^{3,4}

School salad bars are one strategy that has been proposed to increase student consumption of fruits and vegetables. School salad bars are associated with increased availability, accessibility, and variety of fruits and vegetables,⁵⁻⁸ factors which have been shown to increase fruit and vegetable consumption.⁷⁻¹² School salad bars may also increase student participation in school meals and have been highlighted by USDA as one way schools can meet National School Lunch Program (NSLP) standards.^{6,13,14}

In the last 5 years, school salad bars have increasingly gained national attention,¹⁴⁻¹⁶ and public health efforts, such as Let's Move Salad Bars to Schools¹⁷ (a public-private partnership that has been engaged in promoting and sponsoring salad bars in schools since 2010), are working to increase the prevalence of school salad bars.¹⁸ Little is known about socio-demographic disparities in school salad bar access and whether access has changed over time. The objectives of this study were (1) to assess sociodemographic differences in school salad bar availability and (2) to assess changes in youth-reported school salad bar availability over time.

Methods

Design

This cross-sectional study utilized data from the 2011 and 2014 YouthStyles surveys. YouthStyles is an online panel survey conducted by Porter Novelli to assess youths' beliefs, attitudes, and behaviors around topics of public health concern.

Sample

Respondents were youth aged 12 to 17 years residing with adult members of GfK's online research panel KnowledgePanel. Panel members were randomly recruited by probability-based sampling using random digit dialing and address-based sampling and were provided Internet access as necessary to participate. Adult panelists provided consent for youth respondents to participate.

The number of youth recruited to participate in YouthStyles was 2028 in 2011 and 2021 in 2014. Of these, 840 (2011) and 1005 (2014) youth completed the survey. Respondents were excluded from the study sample if they did not respond to the salad bar question (2011: n = 7; 2014: n = 11), yielding a final analytic sample of 833 (2011) and 994 (2014). To create a

more nationally representative sample, data were weighted to match US Current Population Survey proportions using age, sex, race/ethnicity, household income, number of youth in the household aged 12 to 17 years, parent education level, census region, metro status, and presurvey Internet access. This analysis was exempt from the Centers for Disease Control and Prevention's (CDC) institutional review board process because personal identifiers were not included in the data licensed to CDC.

Measures

The outcome variable was youth-reported availability of a salad bar at school. Youth were asked only in 2011 and 2014: "How often does your school cafeteria have a salad bar?" Salad bar availability was classified as "present" if youth responded "every day," "2 to 4 times per week," "once a week," or "less often than once a week." Availability was classified as "absent" if youth responded "My cafeteria does not have a salad bar."

Covariates for this analysis were age (12–14 years or 15–17 years), gender, race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, or non-Hispanic other/multiracial), metropolitan area residence (nonmetro or metro), region of residence (Northeast, Midwest, South, or West), and household income (<US\$50 000, US\$50 000 to <US\$100 000, or US \$100 000). Age categories were selected to approximate the ages of youth during middle and high school. Household income categories were selected to reflect USDA NSLP reduced price meal guidelines.¹⁹

Analysis

Statistical analyses were performed using SAS version 9.3 (SAS Institute Inc, Cary, North Carolina); survey procedures were used to provide weighted estimates. χ^2 tests were used to assess sociodemographic differences between the 2011 and 2014 study samples, to assess sociodemographic differences in availability of school salad bars in each year, and to evaluate changes in availability from 2011 to 2014. Adjusted *P* values were calculated using multivariable logistic regression models to assess availability of school salad bars by sociodemographic differences in each year. Years were modeled separately with each logistic model including all sociodemographic characteristics. Additionally, adjusted *P* values were calculated using multivariable logistic regression subgroup analysis to evaluate changes in availability from 2011 to 2014 among sociodemographic groups. Each subgroup model included all sociodemographic characteristics. Statistical significance was set at *P* < .05. As unadjusted and adjusted analyses were very similar, only adjusted *P* values are presented. To explore the effect of limited availability on the results, analyses were repeated excluding youth responding "less often than once a week."

Results

Youth sociodemographic characteristics in 2011 and 2014 are shown in Table 1. There were no significant sociodemographic differences between the youth respondents in 2011 and 2014.

School salad bar access was reported by 61.8% of youth in 2011 and 67.4% in 2014 (Table 2). Youth-reported access to school salad bars did not differ between sociodemographic

groups in either year, with the exception of age in 2011 (higher among 15- to 17-year-olds; $P = .014$) and race/ethnicity in 2014 ($P = .002$).

Overall youth-reported school salad bar availability increased 5.6% from 2011 to 2014; this increase was not statistically significant ($P = .07$; Table 2). Nonsignificant increases in school salad bar availability were also noted in each sociodemographic subgroup, except for youth aged 15 to 17 years. Three subgroups exhibited a significant change from 2011 to 2014: youth aged 12 to 14 years with an increase of 13.3%; non-Hispanic other or multiracial youth with an increase of 24.6%; and youth in the Midwest with an increase of 14.1%. Exclusion of youth responding “less often than once a week” did not change the above associations and changed the reported prevalence estimates by less than 2 percentage points (data not shown).

Discussion

The results from this study suggest that school salad bar availability does not generally differ across sociodemographic groups. Additionally, although no significant increase in overall youth-reported school salad bar availability was observed between 2011 and 2014, significant increases were noted in some sociodemographic subgroups. Despite these increases, nearly one-third of youth reported not having access to a school salad bar in 2014.

The 2014 prevalence of youth-reported school salad bars reported in the present study is somewhat higher than those reported elsewhere. A national study of secondary education health and obesity prevention policies completed by Bridging the Gap in 2013 reported that less than half of high school (47%) and middle school (41%) youth had access to salad bars at school via the NSLP.²⁰ Similarly, USDA’s School Nutrition Dietary Assessment (SNDA) Study IV reported that only 33% of high schools and 26% of middle schools had salad bars in 2010,²¹ and the School Health Policies and Practices Study (SHPPS) reported 35% of high schools and 31% of middle schools had self-serve salad bars in 2014.²² These discrepancies may be explained by differences in survey methodology; whereas the present study surveyed youth directly, Bridging the Gap surveyed school administrators and weighted the data to be reflective of the student population, and SNDA IV and SHPPS surveyed school administrators and reported school-level data.

The data in this study indicate a possible leveling of differences in salad bar availability between middle and high schools; 15- to 17-year-olds reported more school salad bars than 12- to 14-year-olds in 2011 but not in 2014. This change could be explained by an increase in salad bar prevalence in middle schools as suggested by the increase among 12- to 14-year-olds from 2011 to 2014. Bridging the Gap reported consistent findings.²⁰ The data indicating a leveling off of differences between middle and high schools are encouraging with increasing salad bar availability in middle schools but may indicate a need to refocus salad bar promotion efforts in high schools.

No difference was found in this study in youth-reported school salad bar availability by most sociodemographic characteristics, including household income. This suggests students at the lowest income levels have access to school salad bars. Salad bar availability did differ by

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race/ethnicity in 2014, though this might be explained by the significant increase noted among youth of non-Hispanic other races from 2011 to 2014. As the race/ethnicity of these youth could not be further delineated, it is unclear why the increase may have occurred. Although no regional difference in youth-reported salad bars was seen in either 2011 or 2014, a significant increase was noted in the Midwest region between 2011 and 2014.

This study used a nationwide sample of youth aged 12 to 17 years to evaluate youth-reported school salad bar availability over time and across several sociodemographic factors, making it unique in the body of research regarding school salad bars. However, there are several limitations to this study. These data are based on self-report and subject to recall bias. Additionally, youth report of school salad bar availability could be affected by youths' participation in school lunch or whether they eat in the school cafeteria. Second, the data are limited by a relatively low survey response. Third, the definition of "salad bar" was not specified in the survey question; youth respondents may have interpreted "salad bar" in different ways. Finally, this study did not measure school salad bar usage. Future studies could assess the association between school salad bar availability and usage among youth in secondary education.

The results from this study suggest youth-reported availability of school salad bars does not differ significantly across most sociodemographic subgroups. Additionally, youth-reported salad bar availability increased from 2011 to 2014 among some subgroups. Salad bars are one of many strategies schools can use to promote healthier food environments and encourage student fruit and vegetable consumption. Although progress has been made in increasing school salad bar availability, one-third of youth still report not having access. Efforts to promote school fruit and vegetable availability via salad bars through initiatives such as Let's Move Salad Bars to Schools and via other strategies such as USDA's Fresh Fruit and Vegetable program, state and local nutrition grant programs, and Farm to School programs are needed to continue increasing youth access to fruits and vegetables and potentially improve their diets.

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SO WHAT? Implications for Health Promotion Practitioners and Researchers

What is already known on this topic?

School salad bars are associated with increased availability, accessibility, and variety of fruits and vegetables, factors which can increase fruit and vegetable consumption. Prior studies have reported less than half of high school and middle school youth had access to school salad bars, but little is known about sociodemographic disparities in access and whether access has changed over time.

What does this article add?

This study suggests school salad bar availability does not generally differ across sociodemographic groups. Although no significant increase in overall youth-reported school salad bar availability was observed between 2011 and 2014, significant increases were noted in some sociodemographic subgroups. Despite these increases, nearly one-third of youth reported not having access to a school salad bar in 2014.

What are the implications for health promotion practice or research?

Salad bars are one of many strategies schools can use to promote healthier food environments and encourage student fruit and vegetable consumption. Efforts to promote school salad bars are needed to continue to increase youth access to fruits and vegetables.

Table 1Sociodemographic Characteristics of Youth Respondents by Year.^a

Sociodemographic Characteristics	2011, n ^b (% ^c)	2014, n ^b (% ^c)	P Value ^d
Total	833 (100)	994 (100)	
Age			
12–14 years	454 (49.4)	520 (48.9)	
15–17 years	379 (50.6)	474 (51.1)	.87
Gender			
Male	444 (53.2)	488 (51.3)	
Female	389 (46.8)	506 (48.7)	.53
Race/ethnicity			
White, non-Hispanic	597 (59.1)	678 (55.8)	
Black, non-Hispanic	68 (13.7)	77 (13.6)	
Hispanic	96 (19.8)	141 (21.7)	
Other/multiracial	72 (7.4)	98 (8.9)	.70
Household income ^e			
<US\$50 000	263 (36.7)	323 (35.4)	
US\$50 000–<US\$100 000	353 (39.3)	413 (40.3)	
US\$100 000	217 (23.9)	258 (24.3)	.89
Metropolitan area ^e			
Nonmetro	119 (15.7)	139 (15.4)	
Metro	714 (84.3)	855 (84.6)	.90
Region of residence ^e			
Northeast	160 (17.8)	167 (17.1)	
Midwest	230 (22.9)	276 (21.9)	
South	272 (36.5)	336 (36.9)	
West	171 (22.8)	215 (24.1)	.94

^aYouthStyles, 2011 and 2014.^bUnweighted frequency.^cPercentage weighted to reflect US Current Population Survey proportions.^d χ^2 P value, significance level set at <.05.^eReported by adult caregiver residing in the same household as youth respondent.

Table 2Youth-Reported Presence of a School Salad Bar in 2011 (n = 833) and 2014 (n = 994) by Sociodemographic Characteristics and Survey Year.^a

Sociodemographic Characteristics	2011		2014		Difference in Salad Bar Presence 2011-2014	
	Salad Bar Present, ^b n ^c (% ^d)	P-Value ^e	Salad Bar Present, ^b n ^c (% ^d)	P Value ^e	Difference (% ^d)	P Value ^f
Total	524 (61.8)		652 (67.4)		5.6	.07
Age						
12-14 years	261 (55.9)		339 (69.2)		13.3	<.001
15-17 years	263 (67.6)	.014	313 (65.6)	.23	-2.0	.57
Gender						
Male	285 (62.3)		329 (69.1)		6.8	.11
Female	239 (61.2)	.98	323 (65.6)	.42	4.4	.29
Race/ethnicity						
White, non-Hispanic	372 (62.9)		432 (63.7)		0.8	.83
Black, non-Hispanic	48 (65.4)		52 (71.4)		6.0	.48
Hispanic	62 (56.7)		93 (67.1)		10.4	.20
Other/multiracial	42 (60.0)	.39	75 (84.6)	.002	24.6	.001
Household income ^g						
<US\$50 000	152 (57.6)		200 (64.2)		6.6	.22
US\$50 000-<US\$100 000	228 (64.2)		276 (69.4)		5.2	.25
US\$100 000	144 (64.2)	.31	176 (68.6)	.17	4.4	.26
Metropolitan area ^g						
Nonmetro	69 (62.9)		91 (67.5)		4.6	.58
Metro	455 (61.6)	.89	561 (67.3)	.53	5.7	.08
Region of residence ^g						
Northeast	95 (57.9)		110 (63.6)		5.7	.32
Midwest	145 (57.8)		193 (71.9)		14.1	.01
South	170 (65.9)		201 (66.3)		0.4	.99
West	114 (62.3)	.22	148 (67.6)	.71	5.3	.46

^aYouthStyles, 2011 and 2014.^bYouth reported their school cafeteria had a salad bar “every day,” “2 to 4 times per week,” “once a week,” or “less often than once a week.”

^cUnweighted frequency.^dPercentage weighted to reflect US Current Population Survey proportions.^eP value based on adjusted model for difference between sociodemographic strata for each survey year, model for each year includes all sociodemographic characteristics, significance level set at < .05.^fP value based on adjusted model for difference between survey years for each sociodemographic subgroup, each subgroup model includes all sociodemographic characteristics, significance level set at < .05.^gReported by adult caregiver residing in the same household as youth respondent.