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Consumer Support for Policies to Reduce the Sodium Content in School Cafeterias

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Abstract

Purpose/Objectives—The objective of this study was to assess consumer support for policies lowering the sodium content of cafeteria foods in schools.

Methods—Data were used from 9,634 adults aged ≥18 years who responded to questions about sodium in general and in school foods in a 2010 national mail panel survey. Prevalence of consumer support was determined and logistic regression was used to estimate odds ratios.

Results—Ninety percent (95% CI: 89.1%−90.8%) of respondents support policies that lower sodium content of cafeteria foods in schools. Support for policies was =78% for all subgroups examined. The odds of support were higher for females, non-Hispanic blacks and Hispanics compared with non-Hispanic whites and respondents who reside in the Northeast compared with the South. Those reporting “neutral” or “yes” to wanting to eat a diet low in sodium were more likely to support policies compared with those answering “no.” In addition, the odds of support were higher for those with incomes between $40,000 and $59,999 compared to =$60,000 and those with self-reported high blood pressure.

Applications to Child Nutrition Professionals—Results suggest most adults support policies that lower sodium content of cafeteria foods in schools. School nutrition staff can leverage this support by promoting the healthy changes to school meals to parents and community members and communicating how the school meals contribute to healthful eating behaviors. Additional strategies for change include working with school nutrition stakeholders to adopt and implement strong nutrition standards for all school foods and engaging students to help identify lower sodium recipes that they enjoy.

Keywords

sodium reduction; policy; consumer support; schools

INTRODUCTION

In 2010, the Institute of Medicine [IOM] published recommendations to align school meal requirements with the *Dietary Guidelines* including significantly reducing the amount of sodium in school meals (Institute of Medicine, 2009; U.S. Department of Health and Human Services [USDHHS] & U.S. Department of Agriculture [USDA], 2010). As a result of the Healthy, Hunger-Free Kids Act of 2010, the USDA issued meal standards based on the IOM's report (USDA Food and Nutrition Service [FNS], 2012). These standards, which began to take effect July 2012, required schools to increase the amount of fruits, vegetables, and whole grains offered and reduce the levels of sodium in school meals over a 10-year period. Public support of school nutrition policies can influence their success; yet consumer opinions about policies reducing sodium in foods sold in school cafeterias are unclear.

Average daily sodium intakes for children and adolescents in the United States [U.S.] well exceed the 2010 *Dietary Guidelines for Americans* daily intake recommendations of <2,300 mg for the general population and 1,500 mg for subgroups including African Americans and persons with hypertension, diabetes, and chronic kidney disease (Clark & Fox, 2009; USDA, 2011; USDHHS & USDA, 2010). In a USDA study, school meals were identified as containing excessive amounts of sodium (Fox et al., 2012). The School Nutrition Dietary Assessment –IV [SNDA-IV] found that the mean sodium content offered in school meals during the 2009–2010 school year was between 549–644 mg for breakfasts and 1,395–1,651 mg for lunches (Fox et al., 2012). Therefore the sodium content in school lunches was close to the total daily recommended amount of 1,500 mg/day for African American children (USDHHS & USDA, 2010).

A review of the literature revealed no studies examining public support for policies related to reducing sodium in school cafeterias. Local and state school officials, leaders and policy makers can use information about public support as they consider opportunities to further improve the nutritional quality of foods served to children. In a previous study, "constituents' needs or opinions" were a top factor cited by state legislators for determining priorities for legislation (Dodson et al., 2013). Researchers have also found that support for nutrition policies differed among socio-demographic subgroups (Worsley, 2006; Beeken and Wardle, 2013). Given socio-demographic differences in state populations, differential support by socio-demographic characteristics may influence geographic variability in consumer opinions. It is likely consumer opinion will vary by personal desire to eat a diet low in sodium, which could influence support for policies limiting sodium in foods sold in school cafeterias. Therefore, the main objectives for this study were to assess current consumer sentiment towards policies lowering the sodium content of cafeteria foods in schools and to determine whether support for these policies differed by various socio-demographic characteristics and individual desire to consume less sodium.

METHODOLOGY

In this study, data were obtained from Porter Novelli's[1] 2010 *ConsumerStyles* database. Each year, this database is built from a series of national mail panel surveys that collect information about American consumers and their health attitudes and behaviors. Synovate[2] conducted the mail panel survey used for this study. It was sent to a sample of 20,000 American adults age 18 and older, and 10,328 people completed the survey, yielding a response rate of 51.6%. Participation was voluntary; those who completed the survey were given a small monetary incentive (less than $10) and entered into a sweepstakes with a first place prize of $1000 and 20 second-place prizes of $50.

Survey data were weighted to match the 2009 U.S. Current Population Survey proportions for age, sex, race, income and household size. The Centers for Disease Control and Prevention [CDC] licensed the results of the 2010 *ConsumerStyles* survey post-collection from Porter Novelli. Since no individual identifiers were collected in the Styles survey, it was deemed exempt from IRB review.

Independent Variables

Categorical variables were constructed for age (18–30, 31–50, 51+ years), gender, parent status, race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, and other), education level (high school graduate or less, some college, and college graduate), household income (Under $15,000, $15,000-$24,999, $25,000-$39,999, $40,000-$59,000, and $60,000+), and U.S. Census Region (Northeast, Midwest, South, and West).

Respondents were asked to rate their agreement, on a 5-point Likert scale, with the statement "I want to eat a diet that is low in sodium/salt?" Responses of "strongly agree" and "agree" were combined into one category termed "agree," while "strongly disagree" and "disagree," were combined into one category termed "disagree". "Neither agree nor disagree" was kept as its own category.

Since a previous study indicated that consumers believe those who have high blood pressure or are obese should be more concerned about sodium (International Food Information Council [IFIC], 2011), researchers included self-reported high blood pressure and obesity among the independent variables. Self-reported high blood pressure was determined by a positive response to "high blood pressure" for the question "During the past year, have you had (or do you currently have) any of these health conditions?" Body mass index [BMI] was calculated using self-reported height and weight and was divided into three categories underweight/normal weight, overweight, and obese (<25.0 kg/m2, 25.0–29.9 kg/m2, and =30 kg/m2).

Outcome Variable

To assess current consumer sentiment towards policies lowering the sodium content of cafeteria foods in schools, respondents were asked, "Would you oppose or support policies

[1]Porter Novelli Public Services is a public relations firm with offices at 1909 K Street NW, Washington, DC, 20006.
[2]Synovate, Inc. was a global market research firm that has since been acquired by a larger firm, Ipsos.

that lower sodium/salt content of cafeteria foods in schools?" Response categories included strongly oppose, slightly oppose, slightly support or strongly support. Responses were collapsed into 2 categories, "support" (slightly support, strongly support) and "oppose" (strongly oppose, slightly oppose).

Statistical Analyses

Using responses to the survey question of interest, weighted percentages and 95% confidence intervals were calculated. Chi-square tests were used to assess differences between subgroups, where an a of 0.05 was considered statistically significant. Multiple logistic regression analyses were used to estimate adjusted odds ratios [AOR] and 95% confidence intervals [95% CI] to examine associations between support for policies and selected characteristics, including age, gender, race/ethnicity, education level, income, region, parent status, BMI, self-reported high blood pressure (hypertension status), and desire to eat a diet low in sodium. All statistical analyses were conducted using Statistical Analysis Software (version 9.2, SAS Institute Inc., Cary, NC).

RESULTS AND DISCUSSION

In this study, 694 participants were excluded due to incomplete data for the outcome question (n=270) or socio-demographic variables (n=424), leaving a final sample size of 9,634. The proportions of participants excluded did not vary from those included by gender (p=0.62), age (p=0.09) or self-reported high blood pressure (p=0.25). The proportions of participants excluded vs. included in the analysis varied by race/ethnicity (e.g., 3.9% excluded vs. 6.3% included were "other" race-ethnicity, p=0.001), education (37.7% vs. 26.1% had = high school education, p=0.0005), and household income (e.g., 20.3% vs. 12.4% had income < $15,000, p<0.005).

A majority of respondents were aged 31 years and older, female, and non-Hispanic white. A majority also had some college education or were college graduates, had household incomes greater than $40,000, and were overweight or obese. Overall, 29.7% had self-reported hypertension, 51.0% reported wanting to eat a diet low in sodium, 30.1% were parents of a child currently <19 years old, and 36.4% resided in the southern United States (Table 1).

Of the 9,634 respondents, 89.9% (95% CI: 89.1%−90.8%) reported they strongly (prevalence 52.3%, 95% CI: 50.7%−53.8%, data not shown) or slightly (prevalence 37.7%, 95% CI: 36.2%−39.2%, data not shown) support policies that would lower the sodium/salt content in cafeteria foods in schools, whereas the remainder report they slightly (prevalence 6.6%, 95% CI: 5.8%−7.3%, data not shown) or strongly (prevalence 3.5%, 95% CI: 3.1% −4.0%, data not shown) oppose these policies. Of all subgroups examined, the lowest level of support was among those who did not want to eat a diet low in sodium (77.8%). The highest levels of support were reported by respondents who wanted to eat a diet low in sodium (95.2%) or who were non-Hispanic (93.8%) (Table 2).

After adjusting for socio-demographic characteristics, the odds of support were significantly higher for females (AOR 1.7, 95% CI: 1.4–2.1) compared with males, non-Hispanic blacks (AOR 1.8, 95% CI: 1.2–2.7) and Hispanics (AOR 1.4, 95% CI: 1.1–1.7) compared with

non-Hispanic whites, and those with incomes between $40,000 and $59,999 (AOR 1.4, 95% CI: 1.1–1.8) compared with =$60,000. In addition, support was higher for those with self-reported high blood pressure (AOR 1.3, 95% CI: 1.1–1.5). Those reporting “neutral” (AOR 2.1, 95% CI: 1.6–2.6) or “yes” (AOR 5.6, 95% CI: 4.4–7.0) to wanting to eat a diet low in sodium were more likely to support these policies in comparison to those who responded not wanting to eat a diet low in sodium. Finally, respondents who reside in the northeastern states (AOR 1.5, 95% CI: 1.1–1.9) were more likely to support policies that would reduce sodium in the school cafeteria than those who reside in the South. The adjusted odds of support did not differ by age, education level, BMI, or parental status (Table 2).

Overall, the majority of consumers (90%) support policies that would lower the sodium/salt content in cafeteria foods in schools. Our analysis included information on the individual characteristics associated with support for policies in school cafeterias. As hypothesized, support for policies to reduce the sodium content in this environment was positively associated with some characteristics, e.g., being female, being part of a minority race-ethnicity, living in a Northeastern state, or having self-reported high blood pressure. However, support was not associated with other characteristics, e.g., parental status, educational level, or obesity status. Half of respondents reported wanting to eat a diet low in sodium and, as expected, these adults were more likely to support policies to reduce sodium in school cafeterias.

As previously stated, African-Americans or individuals with hypertension, are specific subgroups recommended to reduce sodium to 1,500 mg. Given the benefit of sodium reduction for individuals with these characteristics, it is possible they are more aware and interested in sodium reduction, and a recent study suggests they have lower sodium intake (Cogswell et al., 2012). Although a previous study suggesting individuals who are obese should have more concern over sodium intake (IFIC, 2011), sodium intake recommendations do not vary by obesity status, and the lack of variation by obesity status is also found in relation to sodium intake (Cogswell et al., 2012). Of interest is the difference in consumer support by region independent of other socio-demographic characteristics. This may be due to a number of state and local strategies that have been implemented in the Northeast, such as New York City’s National Salt Reduction Initiative and Vermont’s nutrition and fitness policy guidelines for schools that set standards related to sodium (New York City Department of Health and Mental Hygiene, 2012; Vermont Department of Health & Vermont Department of Education, 2009).

To the researchers’ knowledge, this is the first study to have assessed support specifically related to sodium reduction policies in school cafeterias among U.S. consumers. Other studies have looked at general support of policies that would change the food environment in schools (Speers et al., 2008; Kids’ Safe & Healthful Foods Project, 2012). For example, the results of a 2008 public opinion poll conducted by Yale University’s Rudd Center found high levels of support for policies that would encourage physical activity and regulate nutrition as an action to promote healthy eating habits to children (mean: 8.01; scale: 1=would not support at all, 10=would support strongly) (Speers et al., 2008) also suggesting high support for school nutrition policies.

The findings should be considered in relation to several possible limitations. The definition of “cafeteria foods in schools” was based on the individual interpretation of the respondent, which may have included foods (e.g. chips and cookies) and beverages that are not part of reimbursable school meals (USDA, 2012). In addition, researchers did not have information on respondent knowledge of current nutrition regulations and practices in the school environment. Furthermore, ConsumerStyles is a mail panel survey; thus, those without a mailing address were not represented. It was also an English-only survey, so those who were not proficient in English were not able to participate. Although data were weighted to the age, sex, race, income, and household size of the U.S. population, there was potential for selection bias related to using data from a mail panel survey completed by volunteers. Additionally, the response rate for the ConsumerStyles survey was 51.6%, suggesting potential non-response bias, which may affect the generalizability of the results. In this study, participants were excluded if any of the variables of interest had missing data. Although a higher percentage of those excluded had lower education level or income, the extent that this affected results was limited, as those excluded comprised <10% of the sample.

CONCLUSIONS AND APPLICATION

While required national reductions in sodium levels in school lunches are subject to scientific review of sodium before being fully implemented over a 10 year period (USDA, 2012), the high levels of consumer support in our study, even among those who do not want to eat a diet low in sodium (78%), suggest sodium reduction in cafeteria foods sold in schools may be acceptable to consumers. School nutrition professionals can capitalize on the strong support for policies to reduce sodium in school foods by promoting the school meal programs to parents, students, and community members, and communicating the health benefits of the meal patterns.

According to the CDC’s School Health Guidelines (2011), school nutrition professionals should receive regular training and professional development to plan and prepare meals that meet the standards. Engaging students and the community in the meal planning process can help ensure that meals will be acceptable to students. For example, schools can collect meal suggestions from students and community members and offer opportunities for them to taste test healthier options. Health education curricula can be modified to educate students about sodium, the negative impacts of excess sodium intake, and how to become supporters for change. The involvement of the food industry to produce a variety of quality products for school meal programs is also critical to implement the meal standards, including the sodium standard.

The sodium targets are phased to allow schools and the food industry time to adjust recipes, reformulate products and recipes, and include new products and recipes into their databases. In addition, the timing is designed to allow for gradual change allowing for adjustment of the student’s palate and acceptance of lower sodium foods. While costs are always a challenge for school nutrition directors, incorporating low sodium foods into menus by purchasing low- and no-sodium foods through the USDA Foods program including frozen and canned vegetables, and reduced sodium cheese can help balance costs. Schools can also

serve more fresh foods and fewer processed foods and use spices and herbs to add flavor to foods instead of salt/seasoning salts.

Study results suggest most U.S. adults (90%) support policies that would lower the sodium content in cafeteria foods in schools. Some study strengths include the large national sample size with diverse demographic and socioeconomic characteristics. These high levels of support, overall and across socio-demographic subgroups, exemplify the widespread acceptance of school policies related to reducing sodium in cafeteria foods. Future surveys should consider assessing the level of support for sodium reduction and its relation to other potential changes (e.g., cost of lower sodium foods). Studies such as this, which gauge consumer sentiment toward health initiatives, can help legislators determine public support for potential policy changes.

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Biography

Patel, Gunn, Merlo, Tong and Cogswell are respectively Oak Ridge Institute for Science and Education Fellow, Public Health Analyst, Health Scientist, Statistician, and Epidemiologist in the Division for Heart Disease and Stroke Prevention at the Centers for Disease Control and Prevention in Atlanta, Georgia.

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Table 1.

Study Participant Characteristics

Characteristic	N [a]	Weighted [b]	
		%	95% CI
Overall	9,634	100.0	
Age (year)			
18–30	533	19.0	17.1 – 21.0
31–50	4,381	41.1	39.7 – 42.5
51+	4,720	39.9	38.5 – 41.2
Gender			
Male	4,648	48.4	46.9 – 49.9
Female	4,986	51.6	50.1 – 53.1
Race/ethnicity			
White, NH	6,370	68.9	67.5 – 70.3
Black, NH	1,110	11.5	10.5 – 12.5
Hispanic	1,219	13.4	12.4 – 14.4
Other [c]	935	6.3	5.6 – 7.0
Education level			
HS graduate or less	2,512	26.1	24.7 – 27.5
Some college	3,637	39.7	38.2 – 41.3
College graduate	3,485	34.2	32.8 – 35.5
Household income ($)			
Under 15,000	1,379	12.4	11.5 – 13.3
15,000–24,999	779	11.7	10.5 – 12.8
25,000–39,999	1,188	15.8	14.5 – 17.1
40,000–59,999	1,524	16.9	15.8 – 18.0
60,000 +	4,764	43.2	41.8 – 44.7
Body Mass Index (kg/m2)			
= 30	3,525	35.5	33.0 – 36.9
25–30	3,190	31.5	30.1 – 32.9
< 25	2,919	33.0	31.5 – 34.5
Self-reported high blood pressure			
No	6,470	70.3	69.0 – 71.6
Yes	3,164	29.7	28.4 – 31.0
Want to eat a diet low in sodium			
No	1,522	15.9	14.8 – 17.1
Neutral	3,071	33.0	31.6 – 34.5
Yes	5,041	51.0	49.5 – 52.6
Parent of a child currently aged <19 years old			

Characteristic	N [a]	Weighted [b]	
		%	95% CI
No	5,772	69.9	68.7 – 71.1
Yes	3,862	30.1	28.9 – 31.3
U.S. Census region			
Northeast	1,808	19.3	18.0 – 20.6
Midwest	2,184	24.0	22.7 – 25.4
South	3,538	36.4	35.0 – 37.9
West	2,104	20.3	19.1 – 21.4

[a] Unweighted

[b] Weighted for age, sex, race, income and household size

[c] Other race includes: Alaska Native, American Indian, Asian, Native Hawaiian, and other Pacific Islander

CI, confidence interval; HS, high school; NH, non-Hispanic

Data source: ConsumerStyles 2010

Table 2.

Consumer Support for Policies to Limit Sodium/Salt Content of Cafeteria Food in Schools

Characteristic	Support [a]		Oppose [b]		OR for Support [c]	OR for support [c]	AOR for Supported	
	%	95 % CI	%	95 % CI	OR	95%CI	OR	95%CI
Overall (n=9,634)	89.9	89.1–90.8	10.1	9.2–10.9				
Age (year)								
18–30	91.8	88.7–94.9	8.2	5.1–11.3	1.2	0.8–1.9	1.1	0.7–1.7
31–50	88.9	87.8–90.0	11.1	10.0–12.2	0.9	0.8–1.02	0.8	0.7–0.97
51+	90.1	89.2–91.1	9.9	8.9–10.8	Reference		Reference	
Gender								
Male	87.4	86.1–88.7	12.6	11.3–13.9	Reference		Reference	
Female	92.3	91.3–93.4	7.7	6.6–8.7	1.7	1.4–2.1	1.7	1.4–2.1
Race/ethnicity								
White, NH	88.8	87.8–89.9	11.2	10.1–12.2	Reference		Reference	
Black, NH	93.8	91.6–95.9	6.2	4.1–8.4	1.9	1.3–2.8	1.8	1.2–2.7
Hispanic	91.5	89.8–93.2	8.5	6.8–10.2	1.4	1.1–1.7	1.4	1.1–1.7
Other [e]	91.9	89.1–94.7	8.1	5.3–10.9	1.4	0.97–2.1	1.5	1.01–2.3
Education level								
HS graduate or less	89.3	87.5–91.1	10.7	8.9–12.5	1.0	0.8–1.2	0.8	0.6–1.01
Some college	90.6	89.2–92.0	9.4	8.0–10.8	1.1	0.9–1.4	1.0	0.8–1.2
College–graduate	89.6	88.5–90.8	10.4	9.2–11.5	Reference		Reference	
Household income ($)								
Under 15,000	90.0	87.8–92.1	10.0	7.9–12.2	1.2	0.9–1.5	1.1	0.8–1.5
15,000–24,999	92.0	89.0–95.1	8.0	4.9–11.0	1.5	0.9–2.3	1.4	0.9–2.1
25,000–39,999	91.2	88.6–93.8	8.8	6.2–11.4	1.4	0.9–1.9	1.3	0.9–1.8
40,000–59,999	91.3	89.6–93.1	8.7	6.9–10.4	1.4	1.1–1.8	1.4	1.1–1.8
60,000 +	88.4	87.3–89.5	11.6	10.5–12.7	Reference		Reference	
Body Mass Index (kg/m2)								
= 30	90.8	89.5–92.1	9.2	7.9–10.5	1.2	0.9–1.5	1.2	0.9–1.5
25–30	89.4	88.2–90.7	10.6	9.3–11.8	1.0	0.8–1.2	1.1	0.9–1.4
< 25	89.5	87.8–91.2	10.5	8.8–12.2	Reference		Reference	
Self-reported high blood pressure								
No	89.4	88.3–90.5	10.6	9.5–11.7	Reference		Reference	
Yes	91.2	90.0–92.4	8.8	7.6–10.0	1.2	1.02–1.5	1.3	1.1–1.5
Want to eat a diet low in sodium								
No	77.8	74.7–80.8	22.2	19.2–25.3	Reference		Reference	
Neutral	87.7	86.1–89.3	12.3	10.7–13.9	2.0	1.6–2.6	2.1	1.6–2.6
Yes	95.2	94.4–95.9	4.8	4.1–5.6	5.6	4.4–7.1	5.6	4.4–7.0
Parent of a child currently aged <19 years old								

Characteristic	Support [a]		Oppose [b]		OR for Support [c]	OR for support [c]	AOR for Supported	
	%	95 % CI	%	95 % CI	OR	95%CI	OR	95%CI
No	90.0	89.0–91.1	10.0	8.9–11.0	Reference		Reference	
Yes	89.7	88.6–90.9	10.3	9.1–11.4	1.0	0.8–1.2	1.0	0.8–1.2
U.S. Census region								
Northeast	92.1	90.6–93.6	7.9	6.4–9.4	1.4	1.1–1.7	1.5	1.1–1.9
Midwest	88.9	86.7–91.2	11.1	8.8–13.3	0.9	0.7–1.2	1.0	0.8–1.3
South	89.6	88.4–90.8	10.4	9.2–11.6	Reference		Reference	
West	89.7	88.0–91.3	10.3	8.7–12.0	1.0	0.8–1.3	1.0	0.8–1.3

[a] "Strongly support" and "slightly support" responses combined

[b] "Strongly oppose" and "slightly oppose" responses combined

[c] Odds ratio comparing support vs. oppose

[d] Odds ratios adjusted for age categories (as specified above), gender, race/ethnicity, education level, household income and regionas applicable using multiple logistic regression.

[e] Other race includes: Alaska Native, American Indian, Asian, Native Hawaiian, and other Pacific Islander

OR, odds ratio; AOR, adjusted odds ratio; CI, confidence interval; HS, high school; NH, non-Hispanic All values weighted for age, sex, race, income and household size according to U.S. census estimates in 2009.

Data source: ConsumerStyles 2010