Measuring Consumers' Awareness of the Major Health Problems Caused by Excessive Sodium Consumption

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Results from a random sample of 1,300 households in Louisiana suggest that consumers know of the diet-related illnesses stemming from over-consumption of sodium. Levels of awareness are higher among older respondents, college graduates, women, those who live in single-person households, or those who are unmarried. Nutritional educational efforts must continue so that more persons will be able to link diseases with diets and subsequently be able to make better food choices.

U.S. Department of Health and Human Services and U.S. Department of Agriculture *Dietary Guidelines* have always recommended that Americans use salt (sodium chloride) in moderation, and the 2005 version is no exception. It recommends that the daily intake be lowered to below 2300 milligrams per day because many Americans consume more sodium than they need and are at increased risks of developing hypertension, coronary heart disease, stroke, congestive heart failure, and kidney disease (USDHHS and USDA 2005). Research suggests that the natural sodium content of food accounts for about ten percent of total intake and that about 70 percent of the sodium content in foods comes from processing (USDHHS and USDA 2005). Consequently, unless consumers read the Nutrition Facts panels carefully they could easily exceed the daily recommendations.

He et al. (1999) suggested that the risks for developing these diseases rise in overweight individuals. They found a stronger positive relationship between a high dietary sodium intake and incidences of high blood pressure, cardiovascular disease and cardiovascular mortality, and stroke and stroke mortality in overweight adults than in normal weight individuals. Vollmer et al. (2001) suggested that men and women, African-Americans and non-African Americans, older and younger participants, and those without hypertension experienced reductions in blood pressure while following low-salt diets. Additionally, older individuals were able to lower blood pressure and control hypertension when they reduced sodium intake (Appel et al. 2001).

The United States is now facing a serious health crisis because of rapid increases in overweight and obesity rates. The percentage of overweight or obese individuals in the United States is now estimated at 67 percent, and diet-related illnesses are rising. Additionally, costs for treating these illnesses have skyrocketed (Frazao 1996). Based on these statistics, every effort must be made to promote healthier diets and lifestyles. The task of promoting a healthy diet is a daunting one because consumers often believe their diets are healthier than they actually are (Variyam, Shim, and Blaylock 2001). If consumers mistakenly believe that their diets are already healthy, campaigns to promote healthful diets will be useless (Shim, Variyam, and Blaylock 2004). For nutritional intervention programs to be effective, researchers must know consumers' levels of awareness of the links between food consumption and health-related issues. One such approach would be to determine consumers' awareness of links between excessive sodium intake and related health problems.

Objectives

This paper examines the links between consumers' identifications of the major health problems caused by eating excessive amounts of sodium and their weight classifications and assesses whether levels of awareness of sodium-related health problems are influenced by age, education, gender, household composition, household income, marital status, race, and body-mass indices.

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Data and Procedures

Data were compiled from a stratified random telephone survey of 1,300 primary grocery shoppers/meal preparers in Louisiana in Fall 2002. The survey was conducted by a marketing research firm. To assess awareness, the interviewers asked the sampled respondents if they knew of any health problems caused by eating too much sodium. Respondents who indicated that they knew about sodium-related health problems were asked to identify the problems from an extensive list of diet-related health problems. Data also were collected on respondents' sociodemographic characteristics (age, education, gender, household income, household size, marital status, and race) and on their heights and weights.

Based on previous studies, we hypothesized that respondents' characteristics (age, education, gender, and race), and situation variables (household composition, household income, and marital status) would affect awareness levels. We used chi-squared contingency tests to determine whether awareness was independent of sociodemographic characteristics and body-mass indices (BMI). These indices were calculated as (weight in pounds x 703)/(height in inches)^2, and were classified as: underweight (BMI<18); healthy weight (18.5≤BMI≤24.9); overweight (25≤BMI≤29.9); obese (BMI≥30).

Empirical Results and Discussion

Descriptive Statistics

Based on the survey results in Table 1, about 60 percent of the respondents were between 18 and 54 years old; 24 percent were college graduates; 73 percent were women; 74 percent lived in multiple-person households; 37 percent had household incomes below $25,000; 50 percent were unmarried; and 70 percent were Caucasians. From the BMI calculations, three percent of the respondents were underweight, 41 percent healthy weight, 31 percent overweight, and 25 percent were obese. The percentage of obese persons in the sample is very close to the reported 23.3-percent obesity rate for Louisiana. Eighty-four percent of the respondents indicated that they were aware of the health problems caused by eating too much sodium.

The four main diseases respondents identified were hypertension (65 percent), heart problems (15 percent), high cholesterol (five percent), and edema (four percent) (Table 2). Only 0.8 percent of the respondents identified strokes as possible byproducts of high sodium diets. This finding is at variance with the literature, which lists strokes as one of diseases that can be caused by excessive sodium consumption. About 41 percent of the respondents in the healthy weight category identified hypertension as one of the sodium-related diseases, compared to 30 percent of those classified as overweight and 27 percent of those classified as obese. The pattern was similar for heart problems and edema. In the case of high cholesterol, 45.6 percent of overweight respondents identified this illness as being linked to high sodium intake, compared to 38.6 percent of healthy-weight individuals. The lower incidences of disease identification by overweight and obese Louisiana residents are troubling in light of He et al. (1999) which suggests that the death rates from sodium-related illnesses are higher for overweight and obese persons than for healthy-weight individuals.

Chi-Square Results

The results suggest that the degree of awareness of the links between sodium intake and diseases are influenced by age, education, gender, household size, and marital status (Table 3). Awareness was independent of household income, race, and body-mass indices. From the results, respondents at least 55 years old were 12 percent more likely to know about sodium-related health problems than were respondents between the ages of 35 and 44. Older consumers were 7.6 percent less likely than were younger consumers (18–34) to be unaware of sodium-related health problems.

Almost 92 percent of college graduates knew of sodium-related health problems, compared to 78 percent of respondents who had not completed high school. Non-high school graduates were also least likely to identify any health problems linked to excessive consumption of sodium. Women (86.5 percent) were better able to identify the diseases than were men (77.4 percent). The likelihood of being able to identify a sodium-related health problem was higher in households with one person than in other household groups. Consequently, unmarried respondents are more aware of these health problems than married respondents. In summary, the most informed respondents were at least 55 years old, college graduates, women, lived in single-person households, and unmarried.

Table 1. Sociodemographic Characteristics of Respondents, Body-Mass Indices, and Awareness of Sodium-Related Health Problems.

Characteristics	Percentages
Age	
Age (18–34)	24.8
Age (35–44)	17.8
Age (45–54)	17.8
Age (≥55)	36.1
Age (Refused)	3.5
Education	
Education (< High school)	17.0
Education (High school)	32.0
Education (Vo tech/Some college)	27.2
Education (College)	23.8
Gender	
Female	73.5
Male	26.5
Household composition	
Household size (1)	17.6
Household size (2)	33.5
Household size (3)	17.8
Household size (>3)	22.6
Household size (Refused)	8.5
Household income	
Income (<$25,000)	36.7
Income ($25,000–$34,999)	11.7
Income ($35,000–$74,999)	11.5
Income (≥$75,000)	20.0
Income (Refused)	20.1
Marital status	
Married	50.0
Unmarried	50.0
Race	
Caucasian	69.6
African-American	25.7
Other races	4.7
Body-mass indices (BMI)	
BMI<18 (Underweight)	2.5
18.5≤BMI≤24.9 (Healthy weight)	41.1
25≤BMI≤29.9 (Overweight)	31.0
BMI≥30 (Obese)	25.4
Awareness	
Yes	84.0
No	16.0

Table 2. Major Health Problems Identified by Body-Mass Indices.

	— Percentages —			
	Hypertension	Heart problems	High cholesterol	Edema
Total	65.0	15.0	5.0	4.0
Body-mass indices (BMI)				
BMI<18 (Underweight)	2.2	17.9	1.8	0.0
18.5≤BMI≤24.9 (Healthy weight)	40.6	35.7	38.6	45.2
25≤BMI≤29.9 (Overweight)	30.1	25.0	45.6	23.8
BMI≤30 (Obese)	27.1	21.4	27.1	31.0

Concluding Remarks

Research suggests that there are strong associations between high salt (sodium chloride) intake and increased risks for developing hypertension, strokes, and cardiovascular diseases, and that overweight individuals are more susceptible to these diseases. Overall, the survey respondents were able to identify the major health problems caused by consuming too much sodium. However, despite He at al. (1999), overweight or obese respondents were less likely to identify sodium-related diseases than were normal-weight individuals.

Nearly all Americans consume more salt (sodium) than they need. However, lifestyle changes can prevent or delay the onset of high blood pressure and other high-sodium-related health problems. The *Dietary Guidelines* recommend that the high sodium content of processed food products can be dampened if Americans increase potassium intake. Potassium-rich foods are readily available and include sweet potatoes, carrots, beans, bananas, spinach, and cantaloupe, among others.

References

Appel, L. J., M. A. Espeland, L. Easter, A.C. Wilson, S. Folmar, and C. R. Lacy. 2001. "Effects of Reduced Sodium Intake on Hypertension Control in Older Individuals: Results from the Trial of Nonpharmacologic Interventions in the Elderly." *Archives of Internal Medicine* 161(5):685–693.

Frazao, E. "The American Diet: A Costly Health Problem." *Food Review* 19(1):2–6.

He, J., L. G. Ogden, S. Vupputiri, L. A. Bazzano, C. Loria, and P. K. Whelton. 1999. "Dietary Sodium Intake and Subsequent Risk of Cardiovascular Disease in Overweight Adults." *Journal of the American Medical Association* 282(21): 2027–2034.

Shim, Y., J. N. Variyam, and J. Blaylock. 2000. "Many Americans Falsely Optimistic about Their Diets." *FoodReview* 23(1):44–50.

U.S. Department of Health and Human Services and U.S. Department of Agriculture. 2005. *Dietary Guidelines for Americans 2005*. www.healthierus.gov/dietaryguidelines.

Variyam, J. N., Y. Shim, and J. Blaylock. 2001. "Consumer Misperceptions of Diet Quality." *Journal of Nutrition Education* 33(6):314–321.

Vollmer, W. M., F. M. Sacks, J. Ard, L. J. Appel, G. A. Bray, D. G. Simmons-Morton, P. R. Conlin, L. P Svetkey, T. P. Erlinger, T. J. Moore, and N. Karanja. 2001. "Effects of Diet and Sodium Intake on Blood Pressure: Subgroup Analysis of the DASH-Sodium Trials." *Annuals of Internal Medicine* 135(12):1019–1028.

Table 3. Respondents' Characteristics and Awareness of Sodium-Related Health Problems.

	— Percentages —				
Characteristics	Yes	No	Refused	χ^2	P-value
Total	84.6	14.8	1.2		
Age					
18–34	82.1	17.9	0.0		
35–44	76.8	22.0	1.2		
45–54	85.3	13.9	0.9		
≥55	88.8	10.3	0.9		
Refused	87.6	10.9	1.5	24.534***	0.002
Education					
< High school	78.3	20.8	0.9		
High school	79.8	17.8	2.4		
Vo tech/Some college	86.1	13.6	0.3		
College	91.6	7.7	0.6	31.549***	0.0001
Gender					
Female	86.5	12.6	0.9		
Male	77.4	20.9	1.7	15.724***	0.0001
Household composition					
Size (1)	88.6	9.6	1.7		
Size (2)	86.4	12.9	0.7		
Size (3)	81.4	18.2	0.4		
Size (> 3)	82.8	14.7	2.5		
Size (Refused)	73.3	26.7	0.0	18.937**	0.041
Household income					
<$25,000	82.6	16.4	1.0		
$25,000–$34,999	84.2	14.5	1.3		
$35,000–$74,999	89.9	8.7	1.3		
≥$75,000	88.1	11.1	0.8		
Refused	79.3	19.2	1.5	13.007	0.112
Total	84.6	14.8	1.2		
Marital status					
Married	83.1	15.8	1.1		
Unmarried	85.6	13.1	1.3	11.927**	0.018
Race					
Caucasian	84.4	14.5	1.1		
African-American	84.4	14.4	1.2		
Other races	77.0	21.3	1.6	2.381	0.666
Body-mass indices (BMI)					
BMI<18 (Underweight)	84.6	14.8	1.2		
18.5≤BMI≤24.9 (Healthy Weight)	75.0	22.2	2.8		
25≤BMI≤29.9 (Overweight)	83.1	15.7	1.1		
BMI≥30 (Obese)	87.1	12.2	0.6	5.845	0.441

Note: (**) and (***) imply statistical significance at 5- and 1-percent levels of probability, respectively.