Continuing Education

A "Fat" Tax: Knowledge and Attitudes of Snack Food Taxing Among College Students

Shari McMahan, Jeffrey Hampl, and Yosuke Chikamoto

Abstract

The economic cost for the United States from heart disease, diabetes, and cancer is estimated at $71 billion annually. Along with this trend, the prevalence of obesity in the United States has reached epidemic proportions. To date, all interventions related to the prevention and treatment of obesity have failed. We must find a new way to prevent this epidemic from spreading. How then can we best encourage people to make lower-fat, more appropriate food choices? What if a tax was applied to unhealthy, fat-laden foods? Among those most affected by such a policy are college-age students. First, this age range (18–29) is at increased risk for obesity, and second, they spend an extraordinary amount of money on convenience food. The purpose of this study was to identify college student's knowledge and attitudes on policies regarding sales tax on snack-related food items. Surveys were administered in a variety of general education courses at two Western universities. Six-hundred sixty surveys were completed. Results indicated that many students (71.5%) were not aware of a snack food tax. About one-half (47.3%) felt they would support such a tax especially if the tax was minimal (e.g., 1 cent).

Poor diet and physical inactivity are estimated to cause up to 580,000 deaths a year from cancer, cardiovascular diseases, and diabetes. The economic cost related to these diseases has been conservatively estimated at $71 billion annually (Jacobsen & Brownell, 2000). Along with this trend, the prevalence of overweight and obesity in the United States has reached epidemic proportions (Centers for Disease Control and Prevention [CDC], 2003). Overweight and obesity is estimated to account for about 9% of annual medical expenditures, $92.6 billion in 2002 dollars (Finkelstein, Fiebelkorn, & Wang, 2003). Currently, more than half of all U.S. adults are considered overweight, defined as having a body mass index (BMI) of 25 or more. Several studies have demonstrated that the obesity epidemic spread rapidly during the 1990s across all states, regions, and demographic groups in the United States (Flegal, Carroll, Kuczmarski, & Johnson, 1998; Galuska, Serdula, Pamuk, Siegel, & Byers, 1996; Kuczmarski, Flegal, Campbell, & Johnson, 1994). Obesity (defined as having a BMI over 30) increased from 12% in 1991 to 17.9% in 1998 (Mokdad et al., 1999). The highest increase occurred among the youngest ages (18- to 29-year-olds), people with some college education, and people of Hispanic ethnicity. In spite of the public health impact of obesity and overweight, these conditions have not been a major public health priority in the past. Halting and reversing the upward trend of the obesity epidemic requires a new approach.

There is general agreement that measures to reduce the fat content of the diet of the population would be helpful in preventing and/or delaying the development of

Shari McMahan, MS, PhD, CHES, is an associate professor of health science in the Division of Kinesiology and Health Promotion at California State University, Fullerton, CA; E-mail: smcmahan@fullerton.edu. Jeffrey Hampl, PhD, RD, is an associate professor in the Department of Nutrition at Arizona State University, Mesa, AZ. Yosuke Chikamoto, PhD, is an assistant professor of health science in the Division of Kinesiology and Health Promotion at California State University, Fullerton, CA.

obesity and the related chronic health diseases (Battle & Brownell, 1997). How then can we best encourage people to make lower-fat, more appropriate food choices? Recent attention has been given to environmental strategies to reduce obesity (Hill & Peters, 1998; Poston & Foreyt, 1999; Swinburn, Egger, & Raza, 1999). Environmental strategies that have been utilized in the past have focused primarily on improving consumer knowledge through mass media, point-of-purchase, and school-based education (Reger, Wootan, & Booth-Butterfield, 1999; Schmid, Jeffery, Forster, Rooney, & McBride, 1989). Results indicate that changes in food behavior are often short-lived. Environmental strategies designed to influence food choice through cost rather than nutrition education have received less attention. A study by Jeffery, French, Raether, and Baxter (1994) found that reducing the costs of fruit and salad by 50% led to an increase in consumption of both fruits and salads during the intervention period. French and colleagues (2001) found that when prices were reduced in vending machines on low-fat items, sales increased by 80%. To further increase healthy food consumption, what if a tax were applied to unhealthy, fat-laden foods? Jacobsen and Brownell (2000) discussed their rationale for such a policy. In fact, 19 states already have taxes applied to "less nutritious foods" such as soft drinks, candy, chewing gum, or other snack foods. However, environmental strategies such as taxation for chronic disease prevention are a source of controversy and philosophical debate (Brownson, Newschaffer, & Ali-Abarghoui, 1997; Jeffery et al., 1990). In the broad sense, opponents in the area of health behavior argue that the individual has a right to make his or her own behavioral choices. Supporters of regulation state that individual choices cannot be separated from a larger social context, and that individual health behavior should be regulated to prevent an unfair burden on others, in this case, the costs of health care expenditures and disability payments on chronic health conditions. Because we live in a democratic society, public opinion will be a major determinant of the feasibility of enacting and enforcing public policies such as taxation.

Among those most affected by such a policy are college-age students. First, this age range (18–29) is at increased risk for obesity; and second, they spend an extraordinary amount of money on convenience foods (Story, Hayes, & Kalina, 1996). College students may be more responsive than older adults to pricing of snack foods given the more central role snack food plays in their diet. The purpose of this study was to identify college students' knowledge and attitudes on policies regarding sales tax on snack-related food items. In addition, programs for which the students felt the revenues of such taxation would be most useful were examined.

METHODS

Participants

Permission was granted from 15 college instructors of lower-division general education classes at two western universities, one in California and the other one in Arizona, to administer a survey on awareness, knowledge, and support of snack food taxes. A total of 16 college instructors were approached. Fifteen approved the survey for dissemination in their classes. The survey took approximately 10–12 minutes of class time to complete. Surveys were completed by 674 students. All students participating in the class completed the surveys. Students (n=12) walking in late after survey administration began were invited to complete the survey but did not. The survey was confidential, anonymous, and had been approved by a Human Subjects Institutional Review Board.

Instrument

Snack Food Survey

The survey consisted of 29 independent items. All questions were descriptive in nature. Validity was determined by an expert panel (n=5 health educators) reviewing the nature and extent of the questions prior to survey administration. A pilot-test was conducted on 30 students for item clarification. Minor revisions were made based on the feedback. The survey was divided into five sections. The first section contained questions that identified awareness of taxes on snack foods such as soft drinks or candy and asked whether the state that they lived in had a snack food tax.

The second section used a Likert-type scale ranging from *strongly agree* to *strongly disagree*, and identified participants' level of support for snack food revenues and how they should be applied: (1) general funds, (2) health promotion programs, or (3) environmental changes. Test–retest reliability, tested 1 week apart on 23 participants, is indicated by Guttman split-half reliability coefficients (using the first administration and second administration as the two halves) of .66, .80, and .88, respectively.

Section 3 queried participants about how much extra they would pay for snack food based on three categories of where revenues would go. Test–retest reliability indicated Guttman split-half reliability coefficients of .99, .96, and .98, respectively. Section 4 asked about level of support for the environment. Guttman split-half reliability coefficients ranged from .64 to .75. The final section asked participants to provide relevant demographic information (i.e., age, sex, political affiliation, and collegiate semester of enrollment) and lifestyle habits.

RESULTS

After exclusion of 14 surveys considered incomplete (missing over 50% of the information), 660 surveys were included in the data analyses. The age of participants ranged from 18 to 57 years (M=20.4, SD=3.37). Subjects were primarily female (65.6%), and had three semesters or less in college (71%; Table 1).

Most participants (71.5%; n=472) were unaware that some states have specific taxes on snack foods. In fact, 55% (n=362) of the participants did not know whether the state they resided in had a snack food tax (Table 2). There were no differences found between level of awareness and the state in which the participant resided. The level of

Table 1. Demographic Characteristics

Variable	*n*	%
State		
Arizona	311	47
California	349	53
Gender		
Male	226	34
Female	433	65
No response	1	1
Age of participants		
17–21	532	81
22–25	94	14
26 and over	34	5
Political affiliation		
Democrat	192	29
Republican	163	25
Independent	55	8
Undeclared	233	35
No response	17	3
Academic level in college		
0–3 semesters	470	71
4–6 semesters	114	17
Over 7 semesters	56	9
No response	20	3
Monthly expendable income[A]		
Less than $20	24	4
$20–35	43	6
$36–50	73	11
$51–100	189	29
> $100	321	49
No response	10	1

Note: *N*=660.
[A]Monthly expendable income to buy clothes, go out to eat, go to dance clubs

agreement for participants supporting a sales tax that would be used for general funds varied. However, 55% (*n*=365) of the participants either strongly agreed or somewhat agreed that they would support a sales tax on snack foods if the funds would be used for health promotion programs, and 58% (*n*=386) strongly or somewhat agreed that they would support a sales tax that would be used to make healthy environmental changes. In comparison with a known regulation, 82.5% (*n*=545) strongly or somewhat agreed to support a sales tax on cigarettes, 72.9% (*n*=481) would support using cigarette sales tax dollars to pay for smoking cessation programs, and 73.5% (*n*=485) would use cigarettes sales tax money to pay for antismoking TV advertising. Participants also were very likely to support sales taxes if the increments were 1 cent verses 5 cents or 7.5 cents (Table 3).

About one-half of the participants (48.3%; *n*=319) felt that food choices were available on their campuses to meet their dietary preferences. Over 80% (*n*=531) reported moderate to much exercise for recreation. On a daily basis, 87.1% (*n*=575) stated that they were moderately or very active. Most participants (84.1%, *n*=555) felt strongly about protecting the environment, although opinions regarding how much they do to protect the environment varied. Thirty-eight percent (*n*=252) walked, biked, or carpooled to campus, and most (76.5%; *n*=505) had not smoked 100 cigarettes in their lifetime (Table 4). Students were more likely to support taxes and pay more if the funds were to be specified for health promotion programs or environmental protection as opposed to a general fund (Table 5).

One way analysis of variance revealed that women were more likely than men to pay more for a candy bar if the funds were used for health promotion programs (F=6.43, p<.012) or environmental changes (F=5.76, p<.018). In addition, those identifying themselves as "Democrats" were more likely to pay more for candy if the funds were to be used for health promotion programs (F=2.81, p<.04) or environmental changes (F=3.96, p<.01).

Table 2. Awareness and Knowledge of Snack Food Taxes

Were you aware that some states have a tax on snack foods (soda, candy, etc.)?	*n*	%
Yes	188	28.5
No	472	71.5
Is there a tax on snack foods (soda, candy, etc.) in the state that you live in?		
Yes	162	24.5
No	136	20.6
Don't know	362	54.8

N=660

DISCUSSION

This study revealed that most college students appeared to be unaware of "snack food taxing." In addition, there were no differences found between participants in California (where taxing on soda pop is effective) and Arizona (where snack food taxing is not currently present). Over one-half of the participants supported levying taxes, if the taxes were to be used for health promotion or environmental programs. This is important given the high rates of obesity and physical inactivity today. The proportion of children and adolescents who are overweight has tripled in the past three decades (Yanovski &Yanovski, 2003). People who are overweight or obese increase their risk for heart disease, diabetes, high blood pressure, arthritis-related disabilities, and some cancers. Furthermore, not getting an adequate amount of exercise is associated with needing more medication, visiting a physician more often, and being hospitalized more often (CDC, 2003).

College students may be more responsive than older adults to pricing of snack foods given the more central role snack foods play in their diet. However, just how much would a college student be willing to pay for snack foods? Brownell and Jacobsen suggested that a national tax of 1 cent on soda pop would generate about $1.5 billion annually, and that these small taxes would unlikely affect the pricing or consumption of food. Participants in this study seem to feel similarly; a 1-cent tax would

Table 3. Level of Support for Sales Taxes

	Strongly Agree n (%)	Somewhat Agree n (%)	Neutral n (%)	Somewhat Disagree n (%)	Strongly Agree n (%)
Snack sales tax to support:					
General funds	13 (2)	130 (9.7)	250 (37.9)	135 (20.5)	132 (20.0)
Health promotion programs	115 (17.4)	250 (37.9)	149 (22.6)	82 (12.4)	64 (9.7)
Environmental changes	137 (20.8)	249 (37.7)	140 (21.2)	67 (10.2)	67 (10.2)
Sales tax on cigarette	449 (68.0)	96 (14.5)	48 (7.3)	25 (3.8)	39 (5.9)
Cigarette sales tax to support:					
Smoking cessation programs	342 (51.8)	139 (21.1)	101 (15.3)	33 (5.0)	42 (6.4)
Antismoking TV advertising	350 (53.0)	135 (20.5)	87 (13.2)	41 (6.2)	44 (6.7)
Increasing sales tax on snack food by:					
1 (1 cent on $)	146 (22.1)	166 (25.2)	161 (24.4)	73 (11.1)	110 (16.7)
5 (5 cents on $)	39 (5.9)	87 (13.2)	152 (23.0)	160 (24.2)	217 (32.9)
7.5 (7.5 cents on $)	19 (2.9)	23 (3.5)	106 (16.1)	154 (23.3)	353 (53.5)

Note: *N*=660.

be supported, whereas a 5- or 7.5-cent tax would be least likely supported.

Due to the following potential limitations, the findings from this study should be interpreted with caution. First, participants in this study seemed to be particularly healthy (nonsmoking) and environmentally conscious (bike, walk, or carpool to school). Future studies would need to identify whether student populations from other universities are as healthful and/or environmentally conscious. Second, the forced-choice response format may have elicited certain survey responses. The subject's primary choice of how the tax funds should be utilized may have been different from the responses provided. Future studies may want to incorporate different question formats. Finally, future studies should collect data using a more representative sample of college students, enhancing the generalizability of the data.

Irrespective of these limitations, environmental strategies such as taxation offer the potential to reduce the $71 billion dollars spent annually in the United States on diseases such as cancer, cardiovascular diseases, and diabetes.

REFERENCES

Battle, E. K., & Brownell, K. D. (1997). Confronting a rising tide of eating disorders and obesity: Treatment vs. prevention and policy. *Addictive Behaviors, 21,* 755–765.

Brownson, R. C., Newschaffer, C. J., & Ali-Abarghoui, F. (1997). Policy research for disease prevention: Challenges and practical recommendations. *American Journal of Public Health, 87*, 735–739.

Centers for Disease Control and Prevention. (2003). *Overweight and obesity*. Retrieved June 23, 2003 from http://www.cdc.gov/nccdphp/dnpa/obesity/index.htm

Table 4. Lifestyle Habits and Support for the Environment

Variable	n	%
Food choices meet dietary preferences		
Yes	319	48.3
No	295	44.7
No reponse	46	7.0
Recreational activities provide:		
Much exercise	197	29.8
Moderate exercise	334	50.6
Little or no exercise	129	19.5
Usual daily exercise		
Very active	175	26.5
Moderately active	400	60.6
Quite inactive	85	12.9
Walk, bike, or carpool to campus		
Daily	252	38.2
Occasionally	139	21.1
Seldom	81	12.3
Never	187	28.3
No response	1	0.2
Smoke 100 cigarettes in lifetime		
Yes	155	23.5
No	505	76.5
Feel about protecting the environment		
Strongly agree	264	40.0
Somewhat agree	291	44.1
Neutral	94	14.2
Somewhat disagree	7	1.1
Strongly disagree	3	0.5
No response	1	0.2
Feel as if I do enough to protect the environment		
Strongly agree	42	6.4
Somewhat agree	206	31.2
Neutral	246	37.3
Somewhat disagree	148	22.4
Strongly disagree	17	2.6
No response	1	0.2

Note: *N*=660.

Finkelstein, E. A., Fiebelkorn, I. C., & Wang, G. (2003). National medical spending attributable to overweight and obesity: How much, and who's paying? *Health Affairs, 22*, W3219–W3226.

Flegal, K. M., Carroll, M. D., Kuczmarski, R. J., & Johnson, C. L. (1998). Overweight and obesity in the United States: Prevalence and trends, 1960-1994. *International Journal of Obesity Related Metabolic Disorders, 22*, 39–47.

French, S. A., Jeffery, R. W., Story, M., Breitlow, K. K., Baxter, J. S., Hannan, P., & Snyder, P. (2001). Pricing and promotion effects on low-fat vending snack purchases: The CHIPS study. *American Journal of Public Health, 91*, 112–117.

Galuska, D. A., Serdula, M., Pamuk, E. Siegel, P. Z., & Byers, T. (1996). Trends in overweight among U.S. adults from 1987 to 1993: A multistate telephone survey. *American Journal of Public Health, 86*, 1729–1735.

Hill, J. O., & Peters, J. C. (1998). Environmental contributions to the obesity epidemic. *Science, 280,* 1371–1374.

Jacobson, M. F., & Brownell, K. D. (2000). Small taxes on soft drinks and snack foods to promote health. *American Journal of Public Health, 90,* 854–857.

Jeffery, R. W., Forster, J. L., Schmid, T. L., McBride, C. M., Rooney, B. L., & Pirie, P. L. (1990). Community attitudes toward public policies to control alcohol, tobacco, and high-fat food consumption. *American Journal of Preventive Medicine, 6*, 12–19.

Jeffery, R. W., French, S. A., Raether, C., & Baxter, J. E. (1994). An environmental intervention to increase fruit and salad purchases in a cafeteria. *Preventive Medicine, 23*, 788–792.

Kuczmarski, R. J., Flegal, K. M., Campbell, S. M., & Johnson, C. L. (1994). Increasing prevalence of overweight among U.S. adults. The national health and nutrition examination surveys, 1960–1991. *Journal of the American Medical Association, 272*, 205–211.

Mokdad, A. H., Serdula, M. K., Dietz, W. H., Bowman, B. A., Marks, J. S., & Koplan, J. P. (1999). The spread of the obesity epidemic in the United States, 1991–1998. *Journal of the American Medical Association, 282*, 1519–1522.

Poston, W. S., II, & Foreyt, J. P. (1999). Obesity is an environmental issue. *Atherosclerosis, 146*, 201–209.

Reger, B., Wootan, M. G., & Booth-Butterfield, S. (1999). Using mass media to promote healthy eating: A community-based demonstration project. *Preventive Medicine, 29*, 414–421.

Schmid, T. L., Jeffery, R. W., Forster, J. L., Rooney, B., & McBride, C. (1989).

Table 5. Paired Difference Between "General Fund Use" and "Health Promotion Programs" and "Environmental Protection"

	Mean	*SD*	Mean Difference[A]	*SD*	*t*	df	*p*
Level of agreement with snack tax if it is used for:							
General fund	3.4	1.07	-	-	-	-	-
Health promotion programs	2.6	1.19	.78	1.217	16.4	659	<.001
Environmental protection	2.5	1.22	.86	1.162	18.9	659	<.001
The amount of total price with tax willing to pay for a 50-cent snack if it is used for:							
General fund	54.7	12.41	-	-	-	-	-
Health promotion programs	59.3	14.87	4.6	9.76	11.6	609	<.001
Environmental protection	59.8	16.08	5.2	13.13	9.7	609	<.001

Note: *N*=660.
[A]Mean of the paired difference between "general fund use" and other use for "health promotion programs" or "environmental protection"

Public support for policy initiatives regulating high-fat food use in Minnesota: A multicommunity survey. *Preventive Medicine, 18,* 791–805.

Story, M., Hayes, M., & Kalina, B. (1996).Availability of foods in high schools: Is there cause for concern? *Journal of the American Dietetic Association, 96*, 123–126.

Swinburn, B., Egger, G., & Raza, F. (1999). Dissecting obesogenic environments: The development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Preventive Medicine, 29*, 563–570.

Yanovski, J. A., & Yanovski, S. Z. (2003). Treatment of pediatric adolescent obesity. *Journal of the American Medical Association, 289*, 1851–1853.