A Comparison of Different Approaches to Promote Community-Wide Dietary Change

Bill Reger, EdD, Margo G. Wootan, ScD, Steven Booth-Butterfield, EdD

Background: Because public health education funds are limited, it is important to determine which methods are most effective for promoting healthy lifestyles to communities. We conducted interventions in two communities to further examine the effectiveness of various educational approaches for communicating the "1% Or Less" message to switch from high-fat (whole or 2%) to low-fat (1% or fat-free) milk.

Methods: One intervention used public relations and community-based educational activities in supermarkets, schools, worksites, and other community settings. The other used paid advertising in the absence of other programming. We used telephone surveys and supermarket milk sales data, collected before and after each campaign and in a comparison community, to determine changes in milk-usage patterns.

Results: After the campaign of community-based educational programs and public relations activities, the proportion of high-fat milk drinkers who reported drinking low-fat milk was 19.6% compared with 6.8% for the comparison city ($p<0.0001$). After the advertising-only campaign, 12.8% of high-fat milk drinkers reported drinking low-fat milk ($p<0.01$). Although supermarkets experienced increases in low-fat milk sales after both campaigns, the results were not statistically significant.

Conclusions: The results show how well-designed public relations activities can attract news coverage and provide further evidence that such coverage can be an important component of health-promotion campaigns. Although the use of paid advertising in the absence of other media or programming appeared to change milk-drinking habits, the results were not sustained after the ads stopped airing.

Medical Subject Headings (MeSH): advertising, diet, health behavior, health education, mass media, nutrition, public relations (Am J Prev Med 2000;18(4):271–275)

Introduction

Saturated fat consumption significantly impacts heart disease,[1] the number one cause of death for American men and women.[2] Although many foods make up the American diet, six types of food (cheese, beef, milk, baked goods, margarine, and butter) contribute half of all dietary saturated fat.[3] Changing the consumption of those few foods could go a long way toward improving Americans' diets and health. For example, if the average American who consumes the average quantities of calories, saturated fat, and milk switched from drinking whole milk to fat-free milk, he or she could decrease saturated fat intake from 12% of calories to 10% of calories, the level recommended by the federal government.[4]

The Center for Science in the Public Interest developed the 1% Or Less campaign[5] to target one of the top sources of saturated fat in Americans' diets. The campaign encourages adults and children over the age of 2 years to switch from high-fat (whole or 2%) to low-fat (1% or fat-free) milk. The 1% Or Less campaign targets the reduction of a major source of saturated fat in Americans' diets, while preserving the benefits of consuming milk.

Because public health education funds are limited, it is important to determine which methods are most effective for promoting healthy lifestyles to communities. The pilot 1% Or Less campaign, which used paid advertising, public relations (PR), and community educational activities in supermarkets, schools, and worksites, was shown to be effective in influencing many members of one community to switch from high-fat to low-fat milk.[4] A follow-up study demonstrated that the

From the Department of Community Health Promotion (Reger), West Virginia University, Morgantown, West Virginia; the Center for Science in the Public Interest (Wootan), Washington, DC; and the Health Communications Research Branch, National Institute for Occupational Safety and Health (Booth-Butterfield), Morgantown, West Virginia

Address correspondence and reprint requests to: Margo G. Wootan, ScD, 1875 Connecticut Avenue, N.W., Suite 300, Washington, DC 20009-5728. E-mail: mwootan@cspinet.org.

 PII S0749-3797(00)00118-5

approach also was effective when the message was delivered by combining paid advertising and PR in the absence of community educational activities.[6] The studies described in this work assessed the effectiveness of two additional approaches to promoting healthy eating. Two community demonstration projects with similar budgets examined the effects of combining PR and community educational activities with paid advertising in the absence of additional programming.

Methods

In the winter of 1997, we studied three rural West Virginia communities. In Parkersburg, population 34,000, the campaign consisted of PR and community-based educational activities. In Beckley, population 18,000, only paid advertising conveyed the campaign message. Martinsburg, population 14,000, served as the comparison city. At least 135 miles separate the three cities. Each of the communities is located in a different media market (they have separate newspapers, television, and radio stations) and none is exposed to the media of any of the other study communities. We chose the three cities, in part, because of the similarity of their demographic characteristics to one another and to Clarksburg/Bridgeport and Wheeling, West Virginia, the sites of two previous 1% Or Less campaigns.[4,6]

Public relations and community-based education. The Parkersburg campaign ran for 8 weeks and cost approximately $51,000. A full-time health educator trained approximately 150 community volunteers to conduct educational activities in supermarkets, schools, worksites, churches, synagogues, shopping malls, and meetings of civic organizations. The educational activities resembled those conducted in the pilot 1% Or Less campaign in Clarksburg and Bridgeport, West Virginia.[4,5] More than 1300 people participated in milk taste tests in which participants tasted whole, 2%, 1%, and fat-free milk while wearing dark sunglasses to mask the appearance of the milk. Taste tests were conducted in supermarkets, schools, worksites, a shopping mall, and other community locations.

Ten out of the eleven supermarkets in the Parkersburg area displayed signs in their dairy cases encouraging customers to choose low-fat milk. Health professionals trained by campaign staff gave presentations to approximately 1100 people (at worksites, clinics of The Special Supplemental Nutrition Program for Women, Infants & Children (WIC), hospitals, and meetings of civic groups) about the importance of nutrition and drinking low-fat milk. Educational activities, such as milk taste tests, speaker presentations, newsletter articles, and displays that compared the amount of fat in whole, 2%, 1%, and fat-free milk, were conducted at 16 worksites (27 large worksites were targeted as sites for campaign activities), both area hospitals, the local WIC office, and 14 civic organizations (out of approximately 40 local civic groups). All 13 primary schools, all four middle schools, and two of the three area high schools participated in the campaign. Schools used peer education, conducted milk taste tests, and taught interdisciplinary lessons to promote low-fat milk consumption to students.

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The PR strategy used in Parkersburg was similar to that of the previous 1% Or Less campaigns in West Virginia.[4–6] Public relations activities included the following: (1) a kick-off press conference, (2) a joint press conference held by the two area hospitals at which prominent local physicians encouraged the community to switch to low-fat milk, (3) an announcement of changes in low-fat milk consumption at the midpoint of the campaign, (4) two radio broadcasts from supermarkets while milk taste tests were being conducted, and (5) a press conference at the end of the campaign.

Paid advertising. The 1% Or Less campaign in Beckley consisted of 6 weeks of paid advertising and cost $50,000. The campaign used the same two 30-second television and two 60-second radio advertisements used in the pilot 1% Or Less campaign[4,5] and the follow-up study conducted in Wheeling, West Virginia.[6] The advertisements were designed for broad appeal but targeted primarily middle-aged women. The placement plan for the advertising, developed by a professional agency, included 281 broadcast television, 366 cable television, and 160 radio advertisements. The television advertising resulted in 670 household gross rating points per week, suggesting that 85% of households were exposed to the commercials approximately 8 times per week for 4 weeks.

Telephone surveys. We conducted baseline telephone interviews with approximately 400 people in each community (1232 total for the three communities) to assess demographic characteristics and milk-usage patterns. Postcampaign questionnaires in the intervention cities also evaluated exposure to the 1% Or Less messages and programs. The survey instruments were very similar to those used in the two previous West Virginia campaigns.[4,6] We purchased random telephone numbers from Scientific Telephone Samples (Santa Ana, California). The adult in the household with the most recent birthday was interviewed for the precampaign survey. After the campaign ended, precampaign survey respondents were called again to complete the postcampaign survey. All telephone interviews required 5 to 8 minutes to complete.

Supermarket milk sales. We collected milk sales data for the month before, for the month after, and for the month 6 months after the campaign from all 21 supermarkets in the three communities. Because data were missing for 1 month for one store in Beckley and for 1 month for one store in Martinsburg, we used no data from those two stores in any of the computations. We collected sales data for whole, 2%, 1%, 1/2%, and fat-free unflavored milk, which make up 94% of the beverage milk consumed nationally.[7] We did not collect data on flavored milk, buttermilk, cream, or lactose-reduced milk.

Statistical analysis. We analyzed the milk sales data using a repeated-measures analysis of variance (ANOVA). The analysis used the three monthly time periods (baseline, postintervention, and 6-month follow-up) as the within-group factor and used city as the between-group factor. We conducted specific contrast tests within the repeated-measures analysis using F tests. Self-reported milk-drinking behavior was analyzed by conducting z-tests on the difference between proportions. Tests of statistical significance also were con-

Table 1. Demographic characteristics of the telephone survey respondents in the intervention and comparison cities

Characteristic	Community programs plus PR city	Advertising-only city	Comparison city
Drank milk at baseline (%)[ns]	87	90	90
Mean age (years)[ns]	50.3	49.4	48.5
Race (% white)*	93	84	86
Gender (% female)**	66	71	59
Years living in West Virginia*	42	41	32
Education (% with college degree)[ns]	22	24	23
Employed (%)[ns]	50	46	59
Household income (% under $15,000)[ns]	20	30	24

*$p < 0.0001$
**$p < 0.05$
[ns]not significant; PR, public relations.

ducted using chi-square analyses. For all analyses, two-tailed tests were used with 0.05 as the alpha level. Analyses were performed using the statistical package SYSTAT, Version 5.0 (SPSS, Inc., Chicago, IL).

Results

The PR strategies in Parkersburg helped establish the 1% Or Less campaign as newsworthy. The Parkersburg campaign generated 27 news stories on television, radio, and in newspapers. No Beckley or Martinsburg television stations, radio stations, or newspapers covered the 1% Or Less campaign.

Telephone Survey

Immediately after the campaigns, 826 of the 1232 precampaign respondents completed a postintervention telephone survey (33% dropout rate). We found no statistically significant differences between those respondents lost to follow-up and those who completed both the precampaign and postcampaign surveys in any of the three communities on any of the survey variables (including the type of milk consumed at baseline, gender, age, education, household income, or employment status).

Using only the respondents who completed both the pre-intervention and postintervention surveys, we compared the demographic characteristics of the three communities (Table 1). We found no differences for baseline milk drinking, age, education level, employment status, or household income. However, we found that Parkersburg had more Caucasian respondents (chi-square [4] = 27.8; $p<0.0001$), Martinsburg had more male respondents (chi-square [2] = 8.9; $p<0.05$), and Martinsburg had a more transient population (chi-square [2823] = 18.6; $p<0.0001$) compared with the other cities.

After the campaign of community–based educational programs and PR activities in Parkersburg, a significant shift occurred from high-fat to low-fat milk compared with the comparison city (Table 2). The proportion of high-fat milk drinkers who reported drinking low-fat milk after the campaign was 19.6% compared with 6.8% for the comparison city ($z=4.86$; $p<0.0001$). In Beckley, where the campaign included only paid advertising, 12.8% of high-fat milk drinkers reported drinking low-fat milk after the campaign, which was significantly greater than the 6.8% reported for the comparison city ($z=2.59$; $p<0.01$). In addition, the campaign of community-based programs and PR activities in Parkersburg resulted in a greater switch from high-fat to low-fat milk (19.6%) than did the advertising-only campaign in Beckley (12.8%) ($z=2.21$, $p<0.05$).

Supermarket Milk Sales

Sales of low-fat milk in Parkersburg, which had the campaign of community-based educational programs

Table 2. Campaign effects on low-fat milk consumption

City	Campaign type	Self-reported switching to low-fat milk	Low-fat milk sales in supermarkets, market share (%)		
			pre-campaign	post-campaign	6-month follow-up
Parkersburg	community programming and public relations	19.6%*	23%	28%[ns]	29%[ns]
Beckley	paid advertising	12.8%**	28%	34%[ns]	27%[ns]
Martinsburg	none	6.8%	23%	22%	21%

The percent of high-fat milk drinkers who reported drinking low-fat milk after the campaign was determined from the telephone surveys. Low-fat milk sales in supermarkets are reported as a percent of all milk sold for the month before, the month after, and 6 months after the 1% Or Less campaigns in West Virginia in 1997.
* $p<0.0001$
** $p<0.01$
[ns] not statistically significant.

and PR, made up 23% of overall milk sales during the month before the campaign (2114 gallons per supermarket per month), 28% of milk sales after the campaign (2243 gallons per supermarket per month), and 29% of milk sales at the 6-month follow-up (2640 gallons per supermarket per month) (Table 2). In Beckley, which had the paid advertising campaign, low-fat milk sales made up 28% of overall milk sales before the campaign (2095 gallons per supermarket per month), 34% of milk sales after the campaign (2137 gallons per supermarket per month), and 27% of milk sales at the 6-month follow-up (2143 gallons per supermarket per month). In the comparison city, low-fat milk sales made up 23% of total milk sales before the campaign (2853 gallons per supermarket per month), 22% of milk sales after the campaign (2597 gallons per supermarket per month), and 21% of milk sales at the 6-month follow-up (2428 gallons per supermarket per month). For both Parkersburg and Beckley, the differences in low-fat milk sales after their campaigns were not statistically significant compared with sales in the comparison city. In addition, over the course of the study period, no significant differences were observed in overall milk sales (whole, 2%, 1%, 1/2%, and fat-free milk combined) in either Parkersburg or Beckley.

Discussion

Only 3% of the health care dollars in the United States are spent on preventive measures,[8] yet half of all deaths relate to lifestyle and other preventable factors.[9] Because funds for prevention, including those for public health education, are limited, they must be used wisely. The studies described in this work provide further information about key components (paid advertising, PR, and community educational activities) of one effective nutrition education campaign: the 1% Or Less campaign.[4]

The telephone survey results suggest that the 1% Or Less campaign in Parkersburg, which included community–based educational programs and PR, was effective in encouraging high-fat milk drinkers to switch to low-fat milk. Although the milk sales data show a similar trend after the campaign, the observed increase in low-fat milk sales was not statistically significant.

The community programs plus PR approach used in Parkersburg resembled the approach used in many other health promotion campaigns.[10–13] Such an approach relies heavily on the availability of health-promotion staff. The program design likely is popular because many community-based organizations and health departments have staff available to conduct health-promotion programs but have limited funds for program implementation. Although this approach may seem inexpensive, the true cost of community–based educational programming is great if staff cost is included. In Parkersburg, staff cost represented 60% of the campaign's $51,000 budget.

In contrast, our previous 1% Or Less campaign in Wheeling, West Virginia, did not use any community–based educational activities.[6] That campaign used a combination of paid advertising and PR. The ads plus PR campaign had a slightly smaller budget, $43,000, yet it resulted in 34% of high-fat milk drinkers switching to low-fat milk compared with approximately 20% in the community programs plus PR campaign in Parkersburg. The pilot 1% Or Less campaign in Clarksburg/Bridgeport, which used a combination of all three approaches (paid advertising, PR, and community programs), had a $61,000 budget and resulted in 38% of high-fat milk drinkers switching to low-fat milk.[4]

The telephone survey results also suggest that a significant number of high-fat milk drinkers switched to low-fat milk after the advertising-only campaign in Beckley. Although the milk sales data show a similar trend, the difference between baseline (28%) and postcampaign (34%) low-fat milk market shares was not statistically significant. However, in the long term, the proportion of low-fat milk sold was virtually the same at the 6-month follow-up (27%) as at baseline (28%).

In comparison, the 1% Or Less campaign in Wheeling, which used paid advertising supported by PR activities, resulted in 34% of high-fat milk drinkers switching to low-fat milk compared with 13% in the advertising-only campaign in Beckley. In addition, low-fat milk sales increased significantly after the ads plus PR campaign, and sales remained significantly higher than baseline up to 2 years after the campaign ended (B.W., unpublished data).[6] Because consumers are bombarded with more than $73 billion of advertising each year,[14] PR activities may be needed to draw attention to the advertising to make it more effective. News coverage that results from PR activities adds credibility to the advertising, allows a campaign to communicate its message in more detail, and increases the number of times people hear the message.

Although the observed trends were consistent with the self-report data, the increases in low-fat milk sales observed after the two campaigns described in this work were not statistically significant. It may have been more difficult to detect the effects achieved by these campaigns because they were smaller than those produced by the previous ads plus PR, and ads plus PR plus community programs campaigns. In addition, the sample size was smaller for the two campaigns described in this work: only five supermarkets in Martinsburg (comparison city) and six supermarkets in Beckley (advertising-only campaign), and two of those supermarkets could not be used in our analysis because of missing data. The variation in overall milk sales between time points and between stores also may have affected the ability to achieve statistical significance.

Available funding restricted this investigation to

three communities, two treatment and one comparison, limiting the generalizability of the findings. Ideally, community intervention research should be conducted in a cluster of randomly assigned treatment and control communities. Although the data are suggestive and consistent with previous findings, uncontrolled and unidentified variables may have accounted for the observed changes.

Our previous study demonstrates that paid advertising combined with PR activities can be an effective means to promote low-fat milk consumption.[6] In contrast, we found that paid advertising alone was not an effective long-term strategy for promoting this dietary change. In addition, the community programs plus PR campaign seemed to be effective. However, the combination of PR and community programs was not as effective as the combination of PR and paid advertising, even though the funding level for the community programs plus PR campaign was higher. These comparisons suggest that PR was an important component of our health-education campaigns. The 1% Or Less campaigns provide another example of how well-designed PR activities can attract news coverage and provide an inexpensive means of reinforcing and strengthening other program components.

This project was funded through a grant from the West Virginia Bureau for Public Health. The authors thank Gus Nelson and Holli Smith for their help in conducting the campaigns and Linda Cooper, Rachel Berger, Quinn Bui, Keith Dalton, Bonita Jackson, Dana Martin, Georgia Hatfield, and Kim Riggi for their assistance with the evaluation.

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