



## Ability of a mass media campaign to influence knowledge, attitudes, and behaviors about sugary drinks and obesity



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### ARTICLE INFO

Available online 24 July 2014

#### Keywords:

Mass media campaign  
Sugar-sweetened beverages  
Sugary drinks  
Public health

### ABSTRACT

**Objective.** We examined the impact of a mass media campaign that was designed to educate residents about the amount of added sugars in soda and other sugary drinks, as well as the health impacts of consuming such drinks.

**Method.** The campaign was implemented in Multnomah County (Portland), Oregon in 2011 and included paid and unpaid media on the web, television, billboards, and transit. A telephone survey ( $n = 402$ ) measured campaign awareness, attitudes toward obesity, knowledge about health problems of excessive sugar, and behavioral intentions and behaviors around soda and sugary drink consumption.

**Results.** Nearly 80% of people who were aware of the media campaign intended to reduce the amount of soda or sugary drinks they offered to a child as a result of the campaign ads. Those who were aware of the campaign were more likely to agree that too much sugar causes health problems (97.3% vs. 85.9%). There was no significant change in self-reported soda consumption.

**Conclusion.** Media campaigns about sugary drinks and obesity may be effective for raising awareness about added sugars in beverages, increasing knowledge about health problems associated with excessive sugar consumption, and prompting behavioral intentions to reduce soda and sugary drink consumption.

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### Introduction

Obesity is one of the most pressing public health and medical problems in the United States. Despite the slowing rate of increase in obesity in recent years (Ogden et al., 2012), its high prevalence coupled with serious and costly health consequences (Thorpe et al., 2004; Lytle, 2012) make it a high priority for the use of population-based approaches.

The association between the consumption of sugary drinks (also referred to as sugar-sweetened beverages or SSBs) and obesity has support in the scientific literature (Brownell et al., 2009). The 2010 Dietary Guidelines for Americans define SSBs as “liquids that are sweetened with various forms of sugars that add calories. These beverages include, but are not limited to, soda, fruit ades and fruit drinks, and sports and energy drinks” (U.S. Department of Agriculture et al., 2010). Sugary drinks are a major source of excess sugar consumption (Jacobson, 2005;

Han and Powell, 2013). Reducing consumption of sugary drinks is an important strategy for obesity prevention and control (Ludwig et al., 2001; Babey et al., 2009; Vartanian et al., 2007).

Public health mass media campaigns and social marketing campaigns are considered an effective tool to improve health behaviors, attitudes, and awareness at a population level (Milat et al., 2005; Randolph et al., 2012). There is ample evidence for the effectiveness of social marketing and mass media campaigns for nutrition-related interventions (Orr et al., 2010; Wakefield et al., 2010; Pollard et al., 2008; Gordon et al., 2006; Beaudoin et al., 2007). Yet, despite numerous national, state, and local healthy beverage campaigns (California Center for Public Health Advocacy, 2012), there is a dearth of studies in the peer-reviewed literature on the impact of mass media campaigns concerned with unhealthy (i.e., sugar-sweetened) beverages (Jordan et al., 2012; Barragan et al., 2014).

The current study evaluates a mass media campaign in Multnomah County (Portland), Oregon that was part of the Communities Putting Prevention to Work (CPPW) initiative, a program funded by the Centers for Disease Control and Prevention to implement policy, systems, and environmental changes focused on obesity- and tobacco-related interventions in communities throughout the United States (Bunnell et al., 2012). The media campaign was focused on educating county residents

**Abbreviations:** CPPW, Communities Putting Prevention to Work; BRFSS, Behavioral Risk Factor Surveillance System; OR, odds ratio; CI, confidence interval; SSBs, sugar-sweetened beverages; BMI, body mass index.

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about the amount of added sugars they unknowingly consume in sugary drinks and raising public awareness about how extra calories consumed through sugary drinks are helping to drive the obesity epidemic.

We evaluated the media campaign using principles based on behavior-change theory, which asserts that behavior change is a multi-stage process in which certain conditions must occur prior to actual change in behavior (Prochaska and DiClemente, 1986). The framework for evaluating the campaign is also based on the work by Flay and Cook (1989), who suggested that social marketing rarely changes behavior directly, but instead works by initially creating awareness, modifying or influencing perceptions, and providing motivation to change attitudes about an issue. Then, as attitudes change, the propensity to change behavior increases. Thus, our evaluation included an assessment of awareness of the campaign (i.e., awareness of the problem of added sugar in beverages), knowledge and attitudes about sugar and obesity, behavioral intentions about sugary drink consumption (i.e., a mediating outcome on the path toward engaging in a new behavior), and changes in actual sugary drink consumption among adults.

## Methods

### Study design

We conducted a population-based, cross-sectional survey in October and November 2011 to obtain data about the “It Starts Here” campaign, which was implemented in Multnomah County, Oregon in 2011.

### Sample

We identified the study sample from respondents to the CPPW Behavioral Risk Factor Surveillance System telephone survey (CPPW BRFSS), a population-based, cross-sectional telephone survey of a random sample of 1691 adult, English-speaking residents of Multnomah County, Oregon conducted in the fall of 2010. Of the 1691 individuals who completed the CPPW BRFSS, 1302 agreed to be contacted again. In the fall of 2011, we conducted a second survey, the media evaluation survey, among those who had agreed to be contacted again. We contacted individuals in October and early November 2011 by landline telephone using BRFSS procedures<sup>1</sup> until we achieved our target of 400 completed surveys, which provided sufficient precision for a margin of error of 5%. In order to obtain an adequate representation from the media campaign's target demographic, women aged 18 to 44, we sorted the calling list of 1302 individuals by age and gender so that younger females, which comprised 12% of the calling list, were at the top of the list but otherwise left the random distribution intact. Our final sample was 402. The response rate was 53%, which represented the number of completed interviews divided by all attempted calls.

This project was reviewed by management at the Multnomah County Health Department and determined to be part of public health practice and not research. Therefore, the Institutional Review Board review was not required.

### Intervention

The objectives of the media campaign were to educate residents about the quantity of added sugars in soda and other sugary drinks, the health impacts of consuming soda and sugary drinks, and the consequences of childhood obesity. The campaign was targeted to women, especially mothers under the age of 45, and included paid and unpaid media on web and social media sites, television, billboards, transit, one shopping mall, Portland Parks and Recreation facilities, Multnomah County libraries and clinics, community publication advertising, and toolkits for use by community members and CPPW partner organizations.

Various campaign components were obtained from external sources and adapted to the local “It Starts Here” campaign (Multnomah County Health Department, 2014). Through a formal agreement with the New York City Department of Health and Mental Hygiene, we obtained and adapted sugar and

soda campaign materials (New York City Department of Health and Mental Hygiene, 2014). Adaptations were made by adding the “It Starts Here” and Multnomah County Health Department logos and by changing the campaign color scheme to green to match the “It Starts Here” materials. Through a partnership with Public Health – Seattle & King County, we obtained language translations of campaign materials (Public Health – Seattle & King County, 2014). Other campaign components were created by the KGW Media Group (the local NBC affiliate), which were provided in a contract media buy. Television advertising buys for daytime television and news programs were purchased specifically to reach the 18–44 female market. Other examples of how we targeted younger mothers included campaign ads placed at a shopping mall where women in the 18–44 age group shop and an article and a web-based poll placed on the blog, [urbanMamas.com](http://urbanMamas.com). Detailed descriptions of specific media components are provided in Table A.1 in Appendix A.

### Measures

We developed a structured questionnaire that contained questions on unaided recall of any sugar ads and aided recall of specific ads. The questionnaire also covered demographics; general knowledge and attitudes about obesity, community health, and sugar; and behavioral intentions and behaviors regarding soda and sugary drink consumption. A detailed description of measures from the media survey instrument that were used in the evaluation is shown in Table A.2 in Appendix A.

### Analysis

For analysis, all 5-point scaled questions were collapsed to 2 categories. All responses of “don't know” to scaled questions were coded as missing. Responses of “don't know” to yes/no questions were coded as “no.” Questions about the consumption of soda and sugary drinks in the past month were coded as “at least one” and “never.”

We determined bivariate differences in proportions using the Pearson  $\chi^2$  test. Differences in proportions over time were examined with the McNemar test. We used multivariable logistic regression to analyze attitudes, knowledge, behavioral intentions, and behaviors predicted from age, gender, and children in household, race/ethnicity, education, BMI, and perceived general health status in the models. Results for logistic regressions were presented as adjusted odds ratios (OR) and 95% confidence intervals (CI). Survey data were weighted using the CPPW BRFSS iterative proportional fitting methodology (also known as raking) that accounted for the CPPW BRFSS sampling design and applied Multnomah population characteristics for race, ethnicity, age, gender, geographic area, education, and marital status. We compared marginal totals for each demographic characteristic between the CPPW BRFSS sample and the media evaluation survey sample and determined that differences in the media survey sample were negligible and did not require further adjustment to the weight. Data tables show weighted population estimates and unweighted counts. We performed all analyses with Stata v. 11 (StataCorp LP, College Station, Texas).

## Results

Four-hundred two individuals responded to the media evaluation survey. Table 1 provides a description of the respondents to the survey. The average length of the telephone interviews was 9.3 min.

Table 2 shows the attitudes, knowledge, behavioral intentions, and sugary drink consumption of respondents. After the campaign, nearly 70% of respondents were aware of at least one campaign element (aided and unaided combined). Most respondents agreed that too much sugar causes health problems (94.2%) and that childhood obesity is a problem in their communities (74.7%). About 46% reported drinking at least one soda in the prior month and 41.3% reported drinking at least one sugary drink other than soda in the prior month. Prior to the campaign, 40.3% of respondents reported drinking at least one soda in the prior month on the CPPW BRFSS. This was the only question that was repeated verbatim in both surveys. The difference was not statistically significant.

There were significant differences in knowledge and behaviors between respondents who were aware of at least one element of the campaign and those who were not (Table 3). Although a high percentage

<sup>1</sup> BRFSS telephone calling procedures: 15 call attempts including at least 3 weekday, 3 weeknight, and 3 weekend calls. Calls were made over 5 weeks with final disposition determined only after at least 5 call occasions. Voice messaging included 2 messages and allowed 2 days for return call. Cell phones were not included.

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