

Effectiveness of a Social Marketing Media Campaign to Reduce Oral Cancer Racial Disparities

Jennifer M. Watson, PhD; Scott L. Tomar, DMD, DrPH; Virginia Dodd, PhD; Henrietta L. Logan, PhD; Youjin Choi, PhD

Objectives: The purpose of this study was to provide a systematic evaluation of a theory-driven oral cancer awareness media campaign.

Methods: We surveyed a cohort of residents in an intervention city (250) and a control city (250) immediately prior to and after the media campaign. Participants (125 black/African American and 125 white) in each city completed surveys at baseline and follow-up. Oral cancer campaign awareness was assessed in both cities, along with 4 hypothetical health campaigns. Oral cancer awareness, oral cancer exam awareness, intent to receive an oral cancer exam, interest in exam, and receipt of exam were also assessed in both cities, both at baseline and follow-up.

Results: Intervention city residents showed a significant increase in recognition of the campaign, awareness of the oral cancer exam, and interest in getting an exam, while no significant changes in those topics were found for the control city. Blacks/African Americans in the intervention city were significantly more likely than whites to demonstrate increases in awareness of the campaign, oral cancer awareness, and interest in receiving an oral cancer exam.

Conclusions: A theory-driven media campaign was successful in increasing awareness of the oral cancer exam and interest in the exam among blacks/African Americans.

Keywords: race/ethnicity ■ cancer ■ health disparities ■ mouth

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Author Affiliations: Community Dentistry and Behavioral Science (Drs Watson, Tomar, and Logan), Health Education and Behavior (Dr Dodd), Public Relations (Dr Choi), University of Florida, Gainesville, Florida.

Corresponding Author: Jennifer M. Watson, PhD, University of Florida, Department of Community Dentistry and Behavioral Science, PO Box 103628, Gainesville, FL 32610-3628 (jwatson@dental.ufl.edu).

INTRODUCTION

Oral and pharyngeal cancers (oral cancer) are relatively understudied, yet it is estimated that more than 34 000 new cases of oral cancer will be diag-

nosed in 2007 in the United States.¹ Survival rates for oral cancer have not improved appreciably in decades.² For unknown reasons, oral cancer is more likely to be fatal in black/African American males.²⁻⁴ Between 1998 and 2002, black/African American males had an age-adjusted incidence rate of oral cancer more than 20% higher than white males, and for black/African American men the 5-year survival rate was only 31% compared to 59% for white men.^{1,3,5} Florida bears a substantial burden from oral cancer. In 2003 Florida had the fifth-highest national age-adjusted incidence rate for males (18.8 per 100 000) and females (7.1 per 100 000),⁶ and ranked second in the number of new cases in 2003 among males and females.⁶

The overall 5-year relative survival rate for oral cancer has not improved substantially during the past 3 decades.² The 5-year relative survival rate varies widely by stage, from 81.8% for cases diagnosed at localized stages, 52.1% for cases with regional lymph node involvement at the time of diagnosis, to just 26.5% for those with distant metastasis.² Unfortunately, only one-third of cases in the United States are diagnosed at localized stages² and only 29.2% of oral cancer cases in Florida were diagnosed at localized stages.⁷

There are substantial differences among racial groups in the stage at diagnosis of oral cancer. Among white men, 32% of cases were diagnosed at localized stages in 1996-2004, compared to just 17% of cases among black/African American men.² Conversely, 62% of cases among black/African American men had spread regionally at the time of diagnosis, compared to 53% among white men.

While there is no consensus among researchers as to why oral cancer mortality rates among black/African American men are greater than those of their white counterparts, prominent factors in this disparity are believed to be lower cancer screening rates and a later stage of cancer presentation in blacks/African Americans.^{8,9} A statewide survey of adult Floridians revealed black/African Americans were significantly less likely than whites to have heard of oral cancer (66.0% vs 90.0%) or to report having had an oral cancer exam even after the exam process was described in detail (19.2% vs 38.6%).¹⁰

At present, the principal method for detecting oral cancer is a comprehensive clinical examination. Therefore, *Healthy People 2010* specifically included an objective to increase rates of oral cancer exams among adults.¹¹ *Healthy People 2010* set a target of 20% of adults being screened for oral cancer; just 7% of blacks/African Americans aged 40 years and older received an oral cancer exam in the preceding 12 months.¹¹ Increasing rate of screening for oral cancer requires effective health promotion campaigns.¹² Research has demonstrated the effectiveness of community media campaigns for changing health behaviors, including promoting dietary change,¹³ increasing immunization knowledge,¹⁴ and reducing smoking.¹⁵

Social marketing is defined as “the application of commercial marketing technologies to the analysis, planning, execution, and evaluation of programs designed to influence the voluntary behavior of target audiences in order to improve their personal welfare and that of their society.”¹⁶ This approach has shown promise in health promotion campaigns targeting the public, health professionals, and policy makers.¹⁷ At the heart of the social marketing approach is a commitment to understand and respond to consumers’ wants and needs. Marketing serves as the organizing concept of this consumer-centered approach. Social marketing examines the influence of 4 primary variables on an individual’s likelihood to engage in a successful exchange: product (commodity, idea, or health practice), price (barriers or costs associated with obtaining or using the product), place (channels of communication and distribution points for products), and promotion (messages that are memorable and persuasive). A careful analysis of each variable and their interactions is necessary to design programs that reflect what consumers truly want and will influence positive behavior change.¹⁵ We utilize the principles of social marketing to provide an important framework in which to design a community-based awareness campaign to increase receipt of oral cancer screenings. In addition, we utilize the transtheoretical model (TTM) to evaluate the efficacy of the social marketing campaign.

Findings from our previous studies indicate large racial disparities in Florida regarding knowledge of oral cancer, receipt of oral cancer examinations, stage of disease at diagnosis, treatment provided, and survival rates.¹⁰ This project seeks to begin closing some of those gaps by focusing on an area of the state—greater Jacksonville—that suffers a disproportionate burden of disease, exhibits substantial racial disparities, and is home to a large proportion of Florida’s black/African American community. Utilizing the principles of social marketing, formative and consumer-driven research was conducted to create a culturally sensitive media campaign that would not only increase awareness of oral cancer among the general public but specifically increase awareness in the high-risk target population of blacks/African Americans.¹⁸

Objectives

The objectives were to (1) assess the impact of a social marketing media campaign designed to increase awareness of oral cancer exams in the intervention area of Jacksonville, Florida; and (2) assess campaign efficacy in our target population (blacks/African Americans).

METHODS

Campaign

Based on the results of several focus groups conducted with blacks/African Americans, printed media materials and radio public service announcements were created.¹⁹ Focus groups findings evidenced that lack of awareness regarding oral cancer was a major factor for low rates of receipt of an oral cancer exam; therefore, campaign messages focused on increasing awareness of oral cancer and its exam. After these materials were created, they were pretested via focus groups and brief intercept interviews (n = 40) with blacks/African Americans. Printed campaign materials showed a black/African American male, and the campaign tagline became “Oral Cancer: It spreads faster than you think,” and individuals were asked to “Contact a dentist to make an appointment for a simple, fast, and painless exam.” Additional information was offered through a toll-free phone number (number of calls, 69) and Web site (www.ocspreads.com; number of hits, 11 244). Brochures and direct mailings contained general statistics on oral cancer and the exam, as well as statistics specific to the black/African American community. Direct mailings were sent to zip codes within the intervention city that had a high density of black/African American residents, and brochures were distributed to all dental practices located in the intervention city. Billboard posters, bus posters, and bus wraps with the same tagline were displayed between June and October, 2006. In addition, two 30-second radio spots were run on 2 stations identified as popular among black/African Americans by our focus group participants and Arbitron radio rating data in the intervention city. The first spot focused on general statistics regarding oral cancer and the utility of the oral cancer exam and the other was a black/African American oral cancer survivor discussing consequences of his treatment and urging people to get an oral cancer exam.

Campaign Assessment

To assess the impact of the social marketing media campaign, we surveyed a cohort of residents in our intervention city (Jacksonville) and also a control city (Tampa) immediately prior to the campaign (baseline) and immediately after the media campaign (follow-up). Tampa is located on Florida’s central gulf coast and Jacksonville is located in the northeast portion of the state, fewer than 50 miles from the Georgia border. The cities are far enough apart (about 200 miles) that Tampa-area residents are unlikely to have

been exposed to the media campaign. Baseline data were initially collected for 2000 participants (1000 in each city) in January to June 2006. The media campaign was implemented immediately after baseline data collection and was completed in October 2006. In both the Jacksonville and the Tampa areas, we oversampled predominantly black/African American areas to ensure that half of the participants in each city were black/African American, to ensure adequate sample size for comparisons by race. This sampling strategy was utilized successfully in our prior surveys of adults in Duval and Miami-Dade counties.¹⁹

The telephone-based surveys were conducted by Independent Data Collection Center in Gainesville. Interviews were conducted 7 days per week from 10 AM to 9 PM. About 80% of the interviews were conducted from 5 to 9 PM. The sample was randomly selected from a commercial listing of household telephone numbers in the target areas. Trained staff interviewed participants using standardized procedures. Data were captured with Voxco version 4.7 computer-assisted telephone interviewing software (Voxco, Montreal, Quebec, Canada). Up to 7 contact attempts were made before a phone number was finalized as unproductive. Refusals were called 3 times. For both the baseline and follow-up surveys our refusal rates were lower and our cooperation rates were higher than other states' surveys.²⁰

Baseline

Telephone numbers were randomly selected within census blocks in the Jacksonville and Tampa metropolitan statistical areas (MSAs). The sample included participants aged 35 years and older living in those MSAs. To ensure an adequate sample size for blacks/African Americans, the sampling design oversampled within census blocks in those MSAs with a large proportion of black/African American residents. To complete our targeted 2000 interviews, 10 054 numbers and 31 710 dials were made in Jacksonville, and 17 171 numbers and 47 668 dials were made in Tampa. There were 273 refusals in Jacksonville and 613 in Tampa.

Follow-Up

A cohort of 500 respondents from the initial sample (Jacksonville, 250; Tampa, 250) was randomly selected to complete the follow-up survey and equal number of blacks/African Americans and whites were surveyed in each city. That sample size provided 80% power to detect an increase in receipt of oral cancer exam from 7% to 20%. Those numbers were based on our prior research that demonstrates low oral cancer screening rates, especially among blacks/African Americans^{10,19} but also specifically on *Healthy People 2010* objectives.

Typically, several months in the field are required to obtain high response rates in cohort phone interviews.

Table 1. Survey Questions Used in Study

Questions	Possible Responses
Do you remember any media campaigns such as billboard ads, radio ads, or TV ads regarding oral cancer or oral cancer screening?	Yes, no
Do you remember any media campaigns (billboard ads, radio, TV ads) regarding breast cancer or breast cancer screening?	Yes, no
Do you remember any media campaigns (billboard ads, radio, TV ads) regarding prostate cancer or prostate cancer screening?	Yes, no
Do you remember any media campaigns (billboard ads, radio, TV ads) regarding quitting smoking?	Yes, no
Do you remember any media campaigns (billboard ads, radio, TV ads) regarding help with alcohol abuse?	Yes, no
Have you ever heard about Oral Cancer, that is, cancer of the throat or mouth?	Yes, no
Have you ever heard of a test or exam for oral or mouth cancer?	Yes, no
Are you seriously considering receiving an oral cancer exam in the next 12 months?	Yes, no
Overall on a scale from 1 to 10 where 1 is not at all interested and 10 is extremely interested, how interested are you in receiving an oral cancer exam?	1-10
Have you ever had an exam for oral or mouth cancer in which the doctor or dentist pulls on your tongue, sometimes with gauze wrapped around it, and feels under the tongue and inside the cheeks?	Yes, no
When did this most recently occur?	LT 12 months to 5 years
Do you regularly get an oral cancer exam?	Every 6 months—do not regularly get exams

However, to ensure that respondents were contacted immediately after the media campaign, all data were collected over a 1-month period. Even with this shorter time frame our response rates were similar or better than typical surveys²¹ with response rates in Jacksonville ranging from 0.283 for whites and 0.287 for blacks/African Americans, and in Tampa response rates ranged from 0.300 for whites and 0.320 for blacks/African Americans.

Questionnaire

The questions related to this study were asked as part of a larger telephone survey that assessed respondents' knowledge of oral cancer signs, symptoms, risk factors, and perceived susceptibility. The survey instrument was based on the instrument used for our statewide survey of adults but was modified to assess specific components of the mass media campaign.^{10,19}

General awareness of the campaign was assessed (Table 1). Participants were also asked to report whether they had seen or heard any messages from 4 hypothetical health campaigns: breast cancer, prostate cancer screening, smoking cessation, or alcohol abuse. These additional items allowed us to assess the specificity of the effect of the oral cancer campaign and identify potential

response biases (eg, indicating yes or no for all campaigns regardless of content). In addition, asking about other hypothetical health campaigns allowed us to identify differences in reporting patterns between the 2 cities. Several questions assessing patterns of oral cancer, oral cancer exam awareness, and the impact of the campaign on self-reported screening behavior were asked at baseline and follow-up to assess the impact of the media campaign on overall oral cancer awareness and awareness of the exam.

We utilized the TTM²² to assess whether our campaign influenced the stage of change. The TTM was originally developed in the area of addiction treatment²² and has been widely applied to health promotion areas (eg, cancer screening, physical activity).^{23,24} The TTM considers behavior change as occurring on a continuum of stages, and views behavior change as a process rather than as a single event. Several questions were used in an algorithm to classify individuals into the appropriate stage of the TTM. Participants were classified as being in the precontemplation stage if they replied that they had never received an oral cancer exam and were not seriously considering getting one in the next 12 months. Participants were classified as being in the combined contemplation/preparation stage if they responded they had never received an oral cancer exam but

Table 2. Selected Demographic Characteristics Collected at Baseline for the Baseline-Only Sample (n = 1500) and Cohort Participants (n = 500) Who Completed Both Baseline and Follow-Up Interviews in the Cities of Jacksonville and Tampa, Florida

Characteristics	Baseline Only ^a		Baseline and Follow-Up ^a	
	Jacksonville	Tampa	Jacksonville	Tampa
	N = 750 ^b n (%)	N = 750 ^b n (%)	N = 250 ^b n (%)	N = 250 ^b n (%)
Sex ^c				
Female	540 (72.0)	509 (67.9)	178 (71.2)	170 (68.0)
Age	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Years	59.7 (13.7)	60.2 (13.8)	63.6 (12.8)	62.4 (13.6)
	n (%)	n (%)	n (%)	n (%)
Education				
< High school	80 (10.7)	79 (10.5)	26 (10.4)	32 (12.9)
High school graduate	191 (25.7)	187 (25.1)	53 (21.2)	62 (25.0)
Some college	212 (28.5)	228 (30.6)	80 (32.0)	69 (27.8)
≥ College grad	261 (35.1)	252 (33.8)	91 (36.4)	85 (34.3)
Annual household income				
<\$20000	106 (18.9)	123 (20.1)	48 (26.2)	56 (26.0)
\$20000-\$34999	147 (26.2)	161 (26.4)	45 (24.6)	48 (22.3)
\$35000-\$49999	93 (16.5)	114 (18.7)	29 (15.9)	35 (16.3)
≥\$50000	216 (38.4)	212 (34.8)	61 (33.3)	76 (35.4)
Heard of oral cancer exam				
Yes	200 (26.8)	181 (24.3)	74 (30.0)	67 (27.0)
Had oral cancer exam				
Yes	194 (25.9)	194 (25.9)	71 (28.4)	81 (32.4)

^aRacial breakdown for baseline and follow-up surveys was equal.

^b May not sum to total due to missing data.

^c χ^2 analyses were conducted for categorical variables and *t* test for continuous variables, *p* < .05.

were planning to get one within the next 12 months. Participants were considered to be in the combined action/maintenance stage if they stated they had received an oral cancer exam, received oral cancer exams regularly, and intended to get an exam within the next 12 months.

ANALYSIS

Descriptive statistics, χ^2 analyses, and *t* tests were conducted to describe and compare baseline and follow-up samples. Within-subject analytic methods were used to analyze the efficacy of the media campaign. City (intervention vs control) and race (black/African American vs white) were the primary independent variables. First, the McNemar χ^2 test was used to determine significant changes in the prevalence of oral cancer campaign awareness, overall oral cancer awareness, and receipt of exam between baseline and follow-up within each city. Next, logistic regression modeling was used to compare the 2 cities on oral cancer awareness and self-reported exam behavior. Participants' improvement (yes/no) of awareness of oral cancer and self-reported screening behavior across baseline and follow-up were used as the dependent variable. For continuous measures (eg, interest in getting an exam), the Student *t* test was conducted on difference scores. Mean scores were calculated for interest and stage of change at baseline and follow-up, and the difference between these 2 means served as the dependent measure.

RESULTS

Demographics

The majority of the sample (69.6%) was female, and the average age of the sample was 63. Most of the participants had at least a high school degree and slightly fewer than half (44.5%) earned less than \$35 000 a year. Comparing those who completed both baseline and follow-up interviews to those who completed only baseline interviews, the 2 samples were similar in sex, education, income, and ever hearing of an oral cancer exam or receiving an oral cancer exam (Table 2). In both cities, follow-up participants were significantly younger than those who did not participate in the follow-up (Jacksonville, $T = -3.92, p < .001$; Tampa, $T = -2.16, p = .03$).

Campaign Awareness

From baseline to follow-up, the proportion of sampled residents in Jacksonville who were aware of the oral cancer media campaign increased from 13.3% to 36.2% ($\chi^2 = 34.37, p < .001$), whereas rates among the residents from Tampa who were sampled did not significantly change (12.9% to 16.6%; $\chi^2 < 0.88, p = .350$; Table 3). There were no other significant differences between Jacksonville and Tampa on awareness of media campaigns or on the other 4 campaigns assessed (breast cancer screening: OR, 0.79; 95% CI, 0.39-1.59; prostate cancer screening: OR, 0.91; 95% CI, 0.48-1.71; smoking cessation: OR, 1.10; 95% CI, 0.51-2.41; or alcohol abuse: OR, 0.72; 95% CI, 0.37-1.38).

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Table 3. Campaign Awareness at Baseline and Follow-Up for Intervention (Jacksonville) and Control (Tampa) Participants

Type of Campaign	Baseline	Follow-Up	χ^2	P Value	OR ^a	95% CI
	n = 250 % Yes	n = 250 % Yes				
Oral cancer campaign						
Jacksonville	13.3	36.2	34.37	<.001	2.79	1.76-4.42
Tampa	12.9	16.6	0.88	.350		
Control Campaigns						
Breast cancer						
Jacksonville	89.5	82.7	6.02	.014	0.79	0.39-1.59
Tampa	89.6	90.4	0.03	.870		
Prostate cancer						
Jacksonville	87.1	75.4	11.36	.001	0.91	0.48-1.71
Tampa	86.0	82.7	0.94	.332		
Smoking cessation						
Jacksonville	92.7	89.8	0.74	.391	1.10	0.51-2.41
Tampa	93.2	89.6	1.83	.176		
Alcohol abuse						
Jacksonville	88.8	83.6	18.25	<.001	0.72	0.37-1.38
Tampa	73.7	77.2	3.21	.073		

Abbreviations: CI, confidence interval; OR, odds ratio.

^a Logistic regression; referent group = Tampa.

were significantly more likely to report awareness of oral cancer compared to whites (OR, 6.43; 95% CI, 1.47-29.34) at follow-up (Table 4). In addition, both black/African American and white residents of Jacksonville showed a significant increase in interest in getting an oral cancer exam from baseline to follow-up (blacks/African Americans: mean, 5.24 vs 6.88; $T = -4.46$; $p < .001$; whites: mean, 4.96 vs 6.40; $T = -4.90$; $p < .001$). However, blacks/African Americans were significantly less likely to report intent to receive an exam in the next year (OR, 0.45; 95% CI, 0.23-0.90) compared to baseline. Blacks/African Americans showed no significant increase in stage of change, while whites did report a significant increase in stage of change (mean at baseline, 1.98 vs mean at follow-up, 2.23; $T = 3.39$; $p < .001$).

Exam Behavior

The rates of ever receiving oral cancer exams were very similar at baseline for Jacksonville (28.4%) and Tampa (32.4%, Table 5). Although Jacksonville residents tended to show a greater increase in receipt of oral cancer exam (6.2 percentage points) than Tampa residents (3.8 percentage points), neither increase was statistically significant (Jacksonville, $\chi^2 = 2.63$, $p = .105$; Tampa $\chi^2 = 1.26$, $p = .263$). This same pattern continued

for receipt of exam in past year (Jacksonville baseline, 22.0%, follow-up, 27.7%; Tampa baseline, 22.0%, follow-up, 24.9%).

Whites (41.1%) in Jacksonville were more than twice as likely as blacks/African Americans (16.3%) to have ever received an oral cancer exam at baseline. This pattern was similar for those who reported receiving an exam in the past year (whites, 33.6%; blacks/African Americans, 10.4%). Black/African Americans were significantly less likely to report an increase in ever receiving an oral cancer exam (OR, 0.43; 95% CI, 0.19-0.98) compared to whites, and this trend continued with blacks/African Americans being less likely to report an increase in receiving an exam in the past year (OR, 0.44; 95% CI, 0.19-1.02) compared to whites (Table 4).

DISCUSSION

Overall, the oral cancer media campaign was successful at increasing awareness and interest of the oral cancer exam, especially in our target audience of blacks/African Americans. Jacksonville residents showed a significant increase only in awareness of the oral cancer media campaign, awareness of the oral cancer exam, and interest in receiving an oral cancer exam. Results were more pronounced for blacks/African Americans in the

Table 5. Oral Cancer and Screening Awareness at Baseline and Follow-Up Surveys for Intervention (Jacksonville) and Control (Tampa) Participants

Oral Cancer Variable/City	Baseline (n = 250)	Follow-Up (n = 250)	χ^2	P Value	OR ^a	95% CI
Heard of oral cancer						
Jacksonville	90.4	83.1	6.28	.012	0.59	0.30-1.17
Tampa	88.4	88.0	0.00	1.000		
Heard of oral cancer exam						
Jacksonville	30.0	40.5	8.86	.003	0.99	0.63-1.57
Tampa	27.0	33.2	2.24	.136		
Ever had oral cancer exam						
Jacksonville	28.4	34.6	2.63	.105	0.97	0.56-1.67
Tampa	32.4	36.2	1.26	.263		
Had exam in past year						
Jacksonville	22.0	27.7	2.75	.097	1.10	0.63-1.94
Tampa	22.0	24.9	0.800	.371		
Intent to receive exam in next year						
Jacksonville	47.7	52.4	1.87	.171	1.28	0.79-2.06
Tampa	40.1	45.0	0.955	.328		
	Mean	Mean	† Difference Between Baseline and Follow- Up	P Value	† Difference Between Races	P Value
Interest in getting exam ^b						
Jacksonville	5.10	6.64	-6.57	<.001	-4.21	<.001
Tampa	4.64	4.84	-0.94	.349		
Stages of change						
Jacksonville	1.82	1.95	2.49	.01	0.81	.421
Tampa	1.83	1.90	1.23	.22		

Abbreviations: CI, confidence interval; OR, odds ratio.

^a Logistic regression; referent group = Tampa.

^b Interest in getting exam is based on scale of 1-10.

intervention city, with blacks/African Americans demonstrating significantly higher oral cancer campaign awareness than whites at follow-up. These findings demonstrate that the campaign was successful in delivering the primary message and increasing awareness of the oral cancer exam in the target audience.

Our media campaign was guided by constructs in the social marketing model. Social marketing dictates that campaigns be consumer driven. Therefore, our target audience helped guide message formulation and placement to ensure it would be salient. The significant increases in awareness of the oral cancer exam, along with increased interest in the exam, demonstrate the efficacy of the campaign. This is in sharp contrast to other campaigns that use more generic messages and do not use a theoretical model.²⁵ For example, the American Dental Association (ADA) ran a 6-month media campaign in 2001 to increase oral cancer awareness. The ADA advertisements featured an attractive 20-something Caucasian woman sticking her tongue out with the text, "It's tiny now. Don't let it grow up to be oral cancer" located under her picture.²⁶ The campaign spokesperson was a person at low risk for oral cancer, and the image chosen was unlikely to resonate with people in the high-risk group. The campaign showed limited success in increasing oral cancer awareness; respondents in 1 intervention county reported greater awareness of the media campaign (13% compared to 9%) but there were no significant differences between the counties in willingness to participate in a cancer screening.¹⁹

Not only did our campaign increase basic awareness, it also demonstrated modest success in increasing interest and moving people along the continuum of behavioral change. Based on past research demonstrating low awareness and receipt of the oral cancer exam,^{10,11} we predicted that most of our sample would be in the precontemplation stage of change. We thus tailored the intervention to match this stage, and we focused on increasing awareness of the disease and screening exam and beginning to move people to higher stages of change. Our results support these predictions: at baseline, almost one-half of the individuals (48%) were in the precontemplation stage; at follow-up, Jacksonville residents showed a significant increase in stage of change. Future interventions should build on this and focus on increasing rates of screening (action stage) in this high-risk area.

Due to the significant racial disparities in morbidity and mortality related to oral cancer,^{3,27} our campaign focused specifically on increasing awareness in blacks/African Americans. In our sample, blacks/African Americans in the intervention city demonstrated a much higher increase in awareness of the campaign (12% to 46%) than whites (14% to 27%). In addition, blacks/African Americans reported increased interest in obtaining the exam after the campaign. These results support the efficacy of a campaign that was created utilizing the

principles of social marketing and the ability of media campaigns to successfully target a high-risk population.

Blacks/African Americans were less likely than whites to obtain an oral cancer exam or indicate they plan to obtain an exam in the next year. This finding is not surprising.²⁸ In fact, black/African American men at greatest risk for oral cancer (smokers or heavy drinkers) are less likely than any other group to have seen a dentist within the preceding year.²⁹ In addition, past research by several members of the research team^{6,30} revealed a lack of trust in the medical system among blacks/African Americans, especially resulting from a lack of knowledge about various treatment procedures and a belief that information is withheld from them. In addition, racial concordance between physicians and patients has been found to be related to trust in the health care system and to health care utilization.³¹ There are few black/African American dentists in Florida overall and in Jacksonville specifically. Therefore, lack of racially similar dentists, mistrust in the medical system, and lack of access to dental care add increased barriers to obtaining the exam for blacks/African Americans and probably result in the lower levels of reporting receipt of the exam or intent to receive exam.

One perplexing finding is the reduction in overall awareness of oral cancer among Jacksonville participants. This is especially disconcerting given the significant increases seen in reports of awareness of the oral cancer campaign, oral cancer exam, and interest in obtaining an exam. It is hard to understand how so many aspects of oral cancer campaign and exam awareness could increase, while overall awareness of oral cancer decreased. One plausible explanation is this may have been due to some sort of measurement error and/or response set bias. There were minor changes in the sequence and number of intervening items between the baseline and follow-up surveys that may have influenced participants to respond negatively to awareness of oral cancer on the follow-up survey.

The results of this study may have been influenced by potential methodological limitations. We employed a non-equivalent control group design in which systematic between-city differences can potentially moderate or explain results. To strengthen our design and to minimize potential difference, we employed the same stratified sampling strategy in both cities and also examined the same individuals in each city for baseline and follow-up assessments. Despite that approach, it is possible that results may have been influenced by other unmeasured factors between Jacksonville and Tampa, such as transportation, location of dental offices, or other access or cultural factors. In addition, our sample was predominately female, which limits conclusions as oral cancer affects males more than females. However, results from our focus group research with blacks/African Americans demonstrated that females in the family were a powerful motivating force for black/African American males to seek cancer

screenings. It is also possible that some of our survey questions were not sufficiently sensitive to detect differences, and we have some evidence that follow-up questionnaire design may have inadvertently influenced response set in the beginning of the survey. Finally, due to the design of the campaign to target black/African Americans, white population may not have been exposed to the campaign to the same degree, and thus there are limitations to the conclusions that can be drawn in assessing how effective the campaign was with white participants.

Results of this study support the efficacy of a theory-driven mass media campaign to increase awareness and interest in oral cancer screening among blacks/African Americans. Participants in our intervention city demonstrated increased awareness of the campaign, increased awareness of oral cancer exams, and increased interest in the exam. These results were most pronounced for blacks/African Americans. This campaign provided an important first step in increasing awareness and interest in oral cancer screening. Future efforts should build on these results with more focused and intensive community interventions. Some research has shown that paid advertising is most effective when part of a multifaceted approach toward health promotion, including community- and school-based programs.^{32,33} We are currently following up with more intensive and focused community interventions based on the evaluation of the media campaign. We have been presenting information on oral cancer at health fairs and are currently conducting a free screening program for oral cancer in the Jacksonville community. Future research will evaluate the efficacy of these more intensive community interventions and how they build on the success of the initial media campaign.

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