Understanding Oral Health Promotion Needs and Opportunities of Tobacco Quitline Callers

JENNIFER B. McCLURE, PhD^a

KARIN R. RIGGS, MSW^a

JACKIE ST. JOHN, BS^a

BARBARA CERUTTI, BA^b

SUSAN ZBIKOWSKI, PhD^b

ABSTRACT

Objective. Improving oral health and oral health care are important public health goals. Tobacco users and smokers are at particularly high risk for oral disease and warrant targeted intervention efforts. We assessed the need for and acceptability of targeting tobacco quitline callers for an oral health promotion intervention.

Methods. We surveyed 816 Washington State Quitline callers to assess their oral health, relevant self-care behaviors, and interest in oral health promotion intervention.

Results. Most respondents were female, cigarette smokers, of low socioeconomic status, with no dental insurance. Of the respondents, 79.3% ($n=647$) had some or all of their natural teeth (e.g., dentate); however, most of these respondents failed to meet recommendations for daily oral hygiene (brushing and flossing) (83.9%, $n=543$) and had no dental visits in the past year (52.6%, $n=340$). Similar findings were observed among respondents with no insurance. Many respondents were interested in learning more about how to improve their oral health (57.4%, $n=468$), willing to speak with a quitline coach about improving their oral health (48.2%, $n=393$), and open to receiving additional oral health information by mail (62.7%, $n=512$) or the Internet (50.0%, $n=408$). People who were receptive to learning how to improve their oral health were significantly more likely to be nonwhite, have a low income, have no dental insurance, and not have visited a dentist in the past year.

Conclusion. There is a need and an opportunity to target quitline callers for oral health promotion services, as those most in need of these services were open to receiving them.

^aGroup Health Research Institute, Seattle, WA

^bAlere Wellbeing (formerly Free & Clear, Inc.), Seattle, WA

Address correspondence to: Jennifer B. McClure, PhD, Group Health Research Institute, 1730 Minor Ave., Ste. 1600, Seattle, WA 98101; tel. 206-287-2737; fax 206-287-2871; e-mail <mcclure.j@ghc.org>.

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The Office of the Surgeon General and the Centers for Disease Control and Prevention recently called for greater partnerships between the public and private sector and the inclusion of health-care organizations, health insurers, and health professionals in efforts to promote oral health.^{1,2} Oral diseases, including periodontal disease, dental caries, and oral and pharyngeal cancers, affect a large proportion of U.S. adults,^{1,3-5} and they exact a large human and economic toll in the United States. Tobacco users are at particular risk for oral disease. More than 90% of cancers of the oral cavity and pharynx are caused by tobacco. Smoking is the second leading modifiable risk factor for periodontitis¹ and accounts for half of all periodontal disease.⁶ Additionally, current smokers have a higher prevalence of untreated tooth decay than never smokers or former smokers,⁵ and more smokers have unmet dental needs than nonsmokers.^{5,7} In addition, smokers are more likely than nonsmokers to drink alcohol,⁸⁻¹¹ have poor nutrition,^{12,13} and fail to seek routine health care,^{14,15} and they are less likely than nonsmokers to visit the dentist.^{16,17} These are all behaviors that increase oral disease risk. In short, tobacco users represent an important target group for oral health promotion efforts.

A novel way to reach tobacco users is to integrate oral health promotion efforts into existing state-sponsored tobacco quitline services. All 50 U.S. states offer free tobacco quitline programs to their state residents, reaching hundreds of thousands of tobacco users each year.¹⁸ Key stakeholders from the nation's leading provider of tobacco quitline services (Alere Wellbeing, formerly known as Free & Clear, Inc.) and from the majority of states with whom they contract support the concept of integrating oral health into tobacco quitline services.¹⁹ We evaluated the need for and feasibility of integrating oral health promotion with a tobacco quitline program based on survey data from a representative sample of callers to the Washington State Quitline (WAQL).

METHODS

Setting and participants

Callers to the WAQL from June to October 2010 were invited to participate in an oral health survey. Using an automated system built into the WAQL registration software, recruitment was randomly turned on and off each week to allow a steady flow of participants throughout the survey window. Within each open recruitment window, WAQL callers were systematically invited to participate at the time of their registration

call. Callers were eligible for participation if they were at least 18 years of age, a current tobacco user, able to read and speak in English, calling the WAQL to enroll in services, and willing to provide consent for their contact information to be shared with Group Health Research Institute (GHRI) for the purpose of mailing the written survey. Invitees ($n=1,591$) represented 29% of all WAQL callers during the invitation window. Eighty-five percent of those invited ($n=1,349$) agreed to receive a mailed survey. Each of these callers was mailed a written survey and self-addressed, stamped return envelope. Invitees who did not return their initial survey within approximately two weeks were mailed a new survey and reminder letter. Four percent of surveys were returned due to invalid addresses, 35% were not returned, and 61% ($n=816$) were returned complete. Each respondent who returned a written survey received \$10 as a thank you for participating.

Assessment and data analysis

Assessment included standardized oral health, dental insurance, and smoking survey questions from the 2009 National Health and Nutrition Examination Survey (NHANES)²⁰ and 2008 Washington State Behavioral Risk Factor Surveillance System.²¹ One NHANES item was modified slightly to read, "In the last seven days, how many days did you use dental floss or any device other than a toothbrush to clean between your teeth?" Participants were also asked about their interest in receiving oral health promotion services (yes/no), if they were available through the WAQL.

We used descriptive statistics to summarize survey results. We examined data for the entire sample, as well as among several key subgroups that would be likely targets of future interventions (i.e., dentate respondents [those with natural teeth], respondents with no dental insurance, and dentate respondents failing to meet American Dental Association [ADA] recommendations for basic oral self-care, defined as brushing at least twice a day and flossing daily). We used robust logistic regression to compare respondents' interest in oral health promotion services.

The sampling frame was designed to provide an adequate sample to generalize results to the broader WAQL population based on primary outcomes that were categorical (e.g., interest in oral health services [yes/no]), based on standard probability sampling metrics.^{22,23} The obtained sample exceeded that required to generalize results to a population of one million or more with 95% confidence.²² Annually, about 12,000 people call the WAQL.

RESULTS

Participant characteristics

Sample characteristics of respondents are shown in Table 1. Participants were predominantly non-Hispanic white, of low socioeconomic status, middle-aged (mean age = 43.1 years), female smokers. Demographic characteristics were similar to that of the entire population of callers during this time period based on aggregate WAQL data (80.3% white, 55.6% female, 54.0% with $\leq$ high school education, mean age 49.1 years, and 96% cigarette smokers) (data not shown). The sample demographics were also consistent with prior published reports of WAQL callers and callers to some other state-supported quitlines.^{24–26}

Most respondents had some or all of their natural teeth (79.3%, $n=647$) but did not have dental insurance (54.5%, $n=445$). A significant proportion of

dentate respondents reported prior treatment for gum disease (21.6%, $n=140$), previous diagnosis of dental bone loss (20.4%, $n=132$), and an assumption of gum disease based on the presence of swollen, receding, sore, or infected gums, or loose teeth (42.8%, $n=277$) (Table 1).

Oral health self-care

Self-reported oral health self-care behaviors among dentate individuals are presented in Table 2. Behaviors were not assessed among people with no natural teeth (i.e., edentulate respondents), which is consistent with NHANES. The majority of all dentate respondents (83.2%, $n=538$) and uninsured respondents (82.9%, $n=295$) failed to meet ADA-recommended guidelines for routine oral hygiene. In fact, only about two-thirds of respondents ($n=376$, 58.1%) reported brushing

Table 1. Characteristics of callers to the Washington State Quitline who were eligible^a to participate in an oral health survey: June–October 2010

Characteristics	All respondents ($n=816$)	Dentate respondents ($n=647$)	Respondents without dental insurance ($n=445$)	Respondents not meeting oral hygiene recommendations ^b ($n=538$)
	N (percent)	N (percent)	N (percent)	N (percent)
Age (in years) (mean [SD])	43.1 (13.5)	41.3 (13.2)	42.8 (13.8)	40.5 (13.0)
Female	503 (61.6)	403 (62.3)	262 (58.9)	321 (59.7)
Non-Hispanic white	643 (78.8)	506 (78.2)	356 (80.0)	419 (77.9)
$\leq$ High school education	419 (51.3)	311 (48.1)	231 (51.9)	265 (49.3)
Household income				
<\$20,000	500 (61.3)	387 (59.8)	275 (61.8)	333 (61.9)
\$20,000–\$39,999	160 (19.6)	128 (19.8)	100 (22.5)	107 (19.8)
$\geq$ \$40,000	84 (10.3)	76 (11.7)	31 (7.0)	52 (9.7)
Current tobacco use				
Cigarette smoker ^{c,d}	725 (88.8)	579 (89.5)	406 (91.2)	483 (89.8)
Pipe, cigar, or bidis ^d	61 (7.5)	47 (7.3)	31 (7.0)	42 (7.8)
Oral tobacco ^d	49 (6.0)	46 (7.3)	31 (6.8)	41 (7.6)
Oral health				
Edentulate ^{e,f}	163 (20.0)	NA	83 (18.7)	NA
Ever treated for gum disease ^{e,g}	140 (17.2)	140 (21.6)	72 (16.2)	111 (20.6)
Think they have gum disease ^{e,g,h}	277 (33.9)	277 (42.8)	154 (34.6)	230 (42.8)
Diagnosed with dental bone loss ^{e,g,h}	132 (16.2)	132 (20.4)	69 (15.5)	100 (18.6)

^aTo be eligible for the survey, callers had to be ≥ 18 years of age, a current tobacco user, able to read and speak in English, be calling the Washington State Quitline to enroll in services, and provide consent for their contact information to be shared with Group Health Research Institute for the written survey.

^bDefined as dentate individuals who reported brushing less than twice daily and flossing fewer than seven days per week

^cDefined as smoking 100 cigarettes in lifetime and smoking in past seven days

^dStandardized items from the 2008 Washington State Behavioral Risk Factor Surveillance System

^eStandardized items from the 2009 National Health and Nutrition Examination Survey

^fReported loss of all natural, permanent teeth

^gAsked of dentate respondents only

^hBased on current symptoms, including swollen gums, receding gums, sore or infected gums, or loose teeth

SD = standard deviation

NA = not applicable

Table 2. Oral health behaviors among dentate respondents who were eligible^a to participate in an oral health survey: Washington State Quitline, June–October 2010

	All dentate respondents (n=647)	Dentate respondents without dental insurance (n=359)	Dentate respondents not meeting oral hygiene recommendations (n=538)
Oral health behaviors	N (percent)	N (percent)	N (percent)
Times brush teeth daily (mean [SD]) ^b	1.8 (0.9)	1.8 (0.9)	1.6 (0.9)
Days floss per week (mean [SD]) ^b	2.9 (2.7)	2.9 (2.8)	2.1 (2.2)
Met ADA brushing recommendation ^{b,c}	376 (58.1)	217 (60.4)	272 (50.6)
Met ADA flossing recommendation ^{b,d}	131 (20.2)	77 (21.4)	27 (5.0)
Met ADA oral hygiene recommendations ^{b,e}	104 (16.1)	61 (17.0)	NA
Visited dentist or dental clinic in last 12 months ^b	307 (47.4)	133 (37.0)	243 (45.2)
Self-reported health of teeth and gums as “good” or better ^{b,f}	255 (39.4)	137 (38.2)	207 (38.5)

^aTo be eligible for the survey, callers had to be ≥18 years of age, a current tobacco user, able to read and speak in English, be calling the Washington State Quitline to enroll in services, and provide consent for their contact information to be shared with Group Health Research Institute for the written survey.

^bStandardized items from the 2009 National Health and Nutrition Examination Survey

^cHaving met ADA recommendations for brushing, defined as brushing at least twice per day

^dHaving met ADA recommendations for flossing, defined as flossing seven days per week

^eHaving met ADA recommendations for oral hygiene, defined as brushing at least twice per day and flossing seven days per week

^fOn a five-point Likert-scale, ranging from 1 = excellent to 5 = poor

SD = standard deviation

ADA = American Dental Association

NA = not applicable

their teeth twice daily. Additionally, most respondents (52.6%) had not received professional dental care in the past year.

Interest in oral health promotion services

Participants were asked about their interest in potential future oral health promotion services. Most individuals were interested in learning more about how to improve their oral health, willing to speak with a quitline counselor about improving their oral health, and open to receiving additional oral health information by mail or the Internet (Figure). Results were similar among people with and without their natural teeth, except that dentate respondents were more interested in learning more about how to improve their oral health. A similar pattern was observed comparing people with and without dental insurance (data not shown).

Compared with people who were not interested in learning more about ways to improve their oral health, those who were interested in learning more were more likely to be nonwhite (66.7% vs. 55.4% non-Hispanic white, odds ratio [OR] = 1.52, 95% confidence interval [CI] 1.01, 2.27; $p=0.043$), have a household income of <\$20,000 per year (60.0% vs. 52.5% of people with an income of >\$20,000/year, OR=1.57, 95% CI 1.13, 2.18; $p=0.007$), have no dental insurance (60.1% vs. 54.8% with insurance, OR=1.53, 95% CI 1.12, 2.09; $p=0.008$), and have not visited the dentist in the past

year (63.9% vs. 59.7% of those who had visited the dentist, OR=1.49, 95% CI 1.05, 2.11; $p=0.026$) (data not shown). No other differences were observed based on demographics, tobacco use status, or whether or not people met oral hygiene recommendations.

DISCUSSION

It has previously been suggested that oral health providers should intervene with smokers during dental visits.⁶ However, because more than 40% of U.S. smokers report not regularly visiting the dentist,⁵ we suggest that working with tobacco quitlines may also be an efficient way to reach tobacco users to promote oral health. To our knowledge, no attempts to integrate these services have ever been made. Yet, findings from this survey confirm that there is a need and an opportunity to target quitline callers based on their oral health status, generally poor self-care behaviors, and interest in future services.

The clear majority of participants failed to meet recommended oral hygiene recommendations, and most had not visited a dental care professional in more than a year. These findings are not unexpected given that most state-supported quitlines target tobacco users who are of low socioeconomic status—a population that tends to have poor oral health outcomes and more limited access to dental care;^{5,27} however, it is noteworthy that

a majority of people were open to receiving an oral health intervention delivered through the quitline. Moreover, groups who are more economically disadvantaged and at higher risk for oral disease were also more likely to be interested in services. Taken together with previous findings that quitline stakeholders are generally supportive of the idea of using tobacco quitlines to promote better oral health,¹⁹ the results suggest that working with tobacco quitlines to offer an integrated oral health intervention is a potentially viable intervention strategy.

It remains unclear whether brief oral health counseling delivered by tobacco counselors can result in meaningful oral health behavior change, but recent evidence indicates that motivational counseling and cognitive-behavioral interventions can be effective means of changing oral health behaviors.^{28–30} Moreover, many behavior changes that can support tobacco cessation (e.g., reduced alcohol intake and use of brushing and flossing as a distraction from cravings) can also

benefit oral health, so there is reason to believe that an integrated intervention program could be dually beneficial. Thus, further investigation appears warranted.

Strengths and limitations

This study had several strengths, including random sampling of WAQL callers, low demand characteristics (i.e., minimal pressure for respondents to misrepresent their attitudes or behaviors), sample size, and the fact that this was the first survey of its kind to address the issue of oral health and tobacco quitlines.

However, the study was subject to several limitations. One limitation was our inability to compare respondents' oral health attitudes and behavior with that of nonrespondents; however, based on our sampling frame, methodology, and the demographic characteristics of respondents compared with the overall population of WAQL callers, we believe that the current results are generalizable to the broader population of WAQL callers. Another potential limitation was our reliance

Figure. Interest in oral health promotion services of dentate respondents who were eligible^a to participate in an oral health survey: Washington State Quitline, June–October 2010

^aTo be eligible for the survey, callers had to be ≥ 18 years of age, a current tobacco user, able to read and speak in English, be calling the Washington State Quitline to enroll in services, and provide consent for their contact information to be shared with Group Health Research Institute for the written survey.

^bProportion of all respondents, dentate respondents, and edentulate respondents interested in receiving oral health promotion intervention or materials through tobacco quitlines. A significant proportion of respondents were receptive to future services. The comparison of dentate vs. edentulate respondents was significantly different (61.9% vs. 40.0%, odds ratio = 1.70, 95% confidence interval 1.18, 2.44; $p=0.004$). No other comparisons of dentate vs. edentulate respondents were statistically significant.

WAQL = Washington State Quitline

on self-report data; however, people would be expected to overreport rather than underreport their adherence to standard oral health recommendations, such as daily brushing, flossing, and use of professional dental care. As such, we have confidence that the findings confirm the need for intervention in this high-risk population.

CONCLUSION

Working with state-supported tobacco quitlines is a creative way to reach underserved, high-risk populations for oral disease. Many states limit free services to those with little or no insurance or other specialty groups (e.g., pregnant smokers) who could benefit from this intervention. The present survey suggests that WAQL callers are generally receptive to the concept of an integrated oral health promotion-tobacco cessation program, particularly those who may need an intervention the most. Further research into whether or not this strategy is effective may be warranted.

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