Oral Health Self-Care Behaviors of Rural Older Adults

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Abstract:

Objectives: This analysis describes the dental self-care behaviors used by a multiethnic sample of older adults and delineates the associations of self-care behaviors with personal characteristics and oral health problems.

Methods: A cross-sectional comprehensive oral health survey conducted with a random, multiethnic (African-American, American Indian, white) sample of 635 community-dwelling rural adults aged 60 years and older was completed in two rural southern counties.

Results: Rural older adults engage in a variety of self-care behaviors, including the use of over-the-counter (OTC) medicine (12.1 percent), OTC dental products (84.0 percent), salt (50.9 percent), prayer (6.1 percent), and complementary therapies (18.2 percent). Some gender and ethnic class differences are apparent, with greater use by women of OTC medicine and salt and greater use by African-Americans and American Indians of OTC medicine and OTC dental products. The use of dental self-care behaviors appears to be driven by need. Those reporting oral pain, bleeding gums, and dry mouth have greater odds of engaging in most of the dental self-care behaviors, including the use of complementary therapies.

Conclusions: The major factor leading to the use of self-care behaviors is need. Although oral pain does increase the use of self-care behaviors, so do bleeding gums and dry mouth. Research and practice should address self-care behaviors used for oral health problems in addition to pain. Investigators should expand analysis of dental self-care behavior and the relationship of self-care behavior to the use of professional services. Further research also should explore the use of complementary therapies in dental self-care.

Article:

INTRODUCTION

Access to health care, particularly dental care, is limited in rural communities (1,2). Compared with urban and suburban communities, rural communities have relatively few dentists. Few rural adults have dental insurance. Rural older adults often have low incomes. The limited access to professional dental care among rural older adults is magnified in the South, where many older adults are members of minority groups (3-5).

Self-care is one means by which older adults can actively engage in managing their oral health without access to professional care (6,7). Self-care is the component of health self-management

that includes behaviors undertaken to enhance health, prevent disease, limit illness, or restore health (8). Health self-management can also include informal support, formal services, and professional care (9). Self-care behaviors may be individually initiated or carried out in collaboration with health professionals. They derive from the individual's knowledge and skills. Gilbert and colleagues (7) explored dental self-carebehaviors among problem-oriented dental attenders and regular dental attenders. They report that dental self-care behaviors include changes in diet and regular mouthwash use to prevent oral health problems (toothache pain, bleeding gums, tooth loss) and the use of over-the-counter (OTC) pain relievers, OTC topical medication, and homemade remedies to treat toothache and bleeding gums. Gilbert and colleagues (7) conclude that dental self-care can complement or substitute for professional dental care, but more knowledge is needed about the relationship of self-care behaviors and decisions to use professional care.

Dental problems experienced by older adults may influence the self-care behaviors that they select. Tooth pain is one dental problem for which the use of self-care behaviors has been examined (6,7,10). Older adults experience dental problems in addition to tooth pain that may influence the use of self-care behaviors. These include bleeding gums, dry mouth, ill-fitting dentures, stained teeth, and bad breath.

Cohen and colleagues (6) used a focus group design to elicit therapies used for toothache among low-income and minority adults. They found that these adults use OTC medicines, OTC dental products, and prescription medicines. The self-care behaviors included a wide variety of home and complementary therapies.

The use of complementary therapies can be a component of health self-care (11,12). Complementary therapies are known to be used widely among older adults (13). However, few studies have examined the use of complementary therapies for oral health in the general population or specifically among older adults. For example, although the 2002 National Health Interview Survey included a module on the use of complementary therapies, and numerous articles have been published with these data, none of these articles consider complementary therapies used for oral health.

This analysis uses data from a comprehensive oral health survey conducted with a large, random, multiethnic sample of rural adults aged 60 years and older to describe dental self-care behaviors. The self-care behaviors include the use of complementary therapies as well as OTC medicines and dental products. Additionally, the associations of self-care behaviors with participants' personal characteristics and oral health problems are delineated.

METHODS

Overview of the Study

The Rural Nutrition and Oral Health (RUN-OH) Study is a cross-sectional survey of the condition of oral health among rural older adults and the association of oral health with nutrition. Data collection for RUN-OH was conducted in two south central North Carolina counties. These rural counties were selected because they have large minority populations, including African-Americans and American Indians.

Sample Design

Eligible participants included community-dwelling, English-speaking older adults aged 60 years and older. Participants were located using a random dwelling selection and screening procedure based on a multistage cluster sampling design in which the primary sampling units (clusters) were stratified and selected with probability proportionate to their sizes. This procedure was designed and implemented by the investigators in consultation with the University of Illinois Survey Research Laboratory.

Within 80 randomly selected, mapped clusters, 5,545, dwelling units were identified. Of these dwelling units, 39 were not screened; 4,647 were screened but did not include an eligible participant, and 859 included an eligible participant. The screening rate was 99.3 percent. Interviewers attempted to recruit participants who met the inclusion criteria in each randomly selected dwelling in a cluster. Once an eligible resident was identified, the interviewer asked to speak with that individual. If the individual was not at home, the interviewer made an appointment to return. The interviewer made at least three additional attempts to contact the selected individual at times that other residents indicated the individual would normally be at home. All randomly selected dwellings were maintained in the sample until their dispositions were finalized.

The eligible resident in 635 of the 859 dwelling units completed the interview, for a response rate of 73.9 percent, while 224 refused to complete the interview. The University of Illinois Survey Research Laboratory provided weights for each participant based on the size of the cluster from which he/she was selected, and his/her probability of selection within each dwelling unit.

Data Collection

Data collection was completed between January 2006 and March 2008. Personal interviews were completed in participant homes or in another location of the participant's choosing, such as a senior center. Interviews took from 1.5 to 2.5 hours to complete. African-American, American Indian, and white interviewers conducted the interviews; three of the five interviewers were residents of the two counties, and all received training that addressed the protection of human subjects and cultural sensitivity, as well as data collection procedures. The questionnaire included sections addressing personal characteristics, current oral health problems, and self-care behaviors used in the past year. Items on self-care included a variety of OTC and home remedies. Participants were also given an opportunity to describe any additional self-care practices they might use. Participants were given an incentive valued at $10.00 at the completion of the interview. Data collection procedures were reviewed by the Wake Forest University School of Medicine Institutional Review Board.

Measures

Measures of self-care behaviors are based on the analysis of Cohen and colleagues (6), and include six major categories: a) OTC medicine; b) OTC dental products; c) Prescription medicine; d) Salt; e) Prayer; and f) Complementary therapies (see Table 2). Complementary therapies refer to a diverse set of self-care behaviors not prescribed or directed by a health-care professional and used to prevent or to treat oral health problems. In addition to the six major

categories, subcategories of OTC dental products and Complementary therapies are also considered, which had substantial use and reflect Cohen colleagues' (6) list. OTC dental products included the subcategories hydrogen peroxide, OTC gels and salves, denture products, special toothpaste, mouthwash, and other products. Complementary therapies included the subcategories tea bags/herbs (and further subcategories herbs or teas, and tobacco), hot/cold (ice), placing aspirin on the affected area, massaging gums, liquor, spices (subcategories of vanilla extract and others), rinsing mouth with toxic substances (such as rubbing alcohol and chlorine bleach), other home remedies (subcategories of Epsom salts, baking soda, vinegar, mechanical procedures, and others), vitamins and minerals (subcategories of vitamins and minerals), and relaxation techniques.

Measures of individual characteristics included age, sex, ethnicity (African-American, American Indian, white), and educational attainment (less than high school, high school, more than high school). Poverty status (below poverty level and above poverty level) is based on total household income and number of persons in the household. Health insurance and dental insurance are dichotomous measures. General oral health status is based on participants' self-reported number of teeth in the categories none, 1-10, 11-20, more than 20. Oral health problems are self-reported dichotomies and include oral pain, bad breath, ill-fitting dentures, bleeding gums, and stained teeth (for dentate).

Analysis

All analyses were calculated based on the weighted data as provided by the University of Illinois Survey Research Laboratory. Data were summarized by using weighted means and standard errors (SEs) for continuous variables, and weighted frequencies and percents for categorical variables. Associations between self-care behaviors and demographic and oral health characteristics were tested using logistic regression. Characteristics include age, gender, ethnicity, education level, poverty, number of teeth, oral pain, bad breath, ill-fitting dentures, bleeding gums, dry mouth, and stained teeth (in dentate participants only). Subsequently, multivariable logistic regression models were used to examine the simultaneous associations between self-care behaviors and demographic and oral health characteristics, including age, gender, ethnicity, education level, number of teeth, oral pain, bad breath, ill-fitting dentures, bleeding gums, and dry mouth. Because the category stained teeth is only assessed in dentate participants, a second set of multivariable logistic regression models was fit, looking at all previous characteristics plus stained teeth. All analyses were completed using SAS version 9.1 (Cary, NC, USA).

RESULTS

Participant Characteristics

Participants had a mean age of 71.5 years (SE 0.4) (Table 1). Over half the participants were female. The participants included substantial percentages of African-Americans (21.4 percent), American Indians (30.7 percent), and whites (47.8 percent). Most of the participants had less than a high school education (55.7 percent), with one in five having more than a high school education. Most participants had health insurance (93.5 percent), with few having dental insurance (10.1 percent). Almost one-third of the participants had incomes below the poverty level.

Substantial percentages of the participants had oral health problems. Over one-third had no teeth, and 16.6 percent had from 1 to 10 teeth. More than 1 in 10 had oral pain. More than one in five participants had dentures that did not fit, bleeding gums, or bad breath. Almost half of the participants had dry mouth. Of the dentate participants, 43.4 percent had stained teeth.

Self-Care Behaviors

The older adults engaged in a variety of self-care behaviors (Table 2). The most prevalent behaviors involved the use of OTC dental products (84.0 percent), particularly mouthwash (77.9 percent), hydrogen peroxide (28.2 percent), and denture products (21.6 percent). OTC gels and salves were used by 10.6 percent of the older adults. OTC medicine was used by 12.2 percent. Few older adults used prescription medicine (0.9 percent).

Salt was used by over half of the older adults. Complementary therapies were used by almost one in five participants. The use of complementary therapies included a diverse set of behaviors, with no single behavior being used by more than about 5 percent of the older adults. The most widely used complementary therapies were using hot/cold (5.5 percent), rinsing the mouth with toxic substances (4.5 percent), and placing aspirin on an affected area (3.3 percent). For the general category, other home remedies, 3.9 percent used baking soda.

Personal Characteristics and Oral Health Problems Associated with Self-Care Behaviors

In addition to the major self-care behavior categories (OTC medicine, OTC dental products, Salt, and Complementary therapies), Hydrogen peroxide is included in further analyses because it had sufficient variability in its use (more than 25 percent but less than 75 percent).

Age and gender have some association with these self-care behaviors, with younger age slightly reducing the odds of using OTC medicine and hydrogen peroxide, while women have a greater odds than men for using OTC medicine and salt (Table 3). Ethnicity is consistently related to the use of self-care behaviors such that minorities have a greater odds than whites of using most self-care behaviors. African-American older adults have over twice the odds of using OTC medicine, OTC dental products, and hydrogen peroxide than do white older adults. American Indian older adults have over twice the odds of using OTC medicine, OTC dental products, hydrogen peroxide, and salt than do white older adults. Older adults do not differ by ethnicity in the use of complementary therapies.

Education is also consistently associated with the self-care behaviors. Those with less than a high school education have greater odds of using OTC medicine, hydrogen peroxide, and salt than do those with more than a high school education. Those with a high school education do not differ in the self-care behaviors from those with more than a high school education. Poverty status is not related to use of any of the self-care behaviors.

The associations of number of teeth with self-care behaviors indicated three strong patterns. Those with fewer teeth (0 or 1-10 versus more than 20) had lower odds of using hydrogen peroxide. Those with fewer teeth (0 or 11-20 versus more than 20) had greater odds of using salt. Those with fewer teeth had lower odds of using complementary therapies. Those with no teeth versus those with more than 20 teeth had greatly lower odds of using OTC medicine. Those with

some teeth (11-20) had over twice the odds of using OTC dental products compared with those with more than 20 teeth.

Oral health problems had the most consistent patterns of association with self-care behaviors. Those with any oral health problem, except ill-fitting dentures, had greater odds of using almost all of the self-care behaviors. Those with oral pain, bad breath, bleeding gums, dry mouth, and stained teeth had greater odds of using OTC medicine, hydrogen peroxide, and salt. Additionally, those with ill-fitting dentures had greater odds of using salt. Those with oral pain, bad breath, and bleeding gums had greater odds of using OTC dental products. Those with oral pain, bad breath, and bleeding gums had greater odds of using complementary therapies.

Multivariate Analysis

Although the multivariate models reduce the number of statistically significant associations of personal characteristics and oral health problems with the categories of self-care behaviors for all participants and dentate participants, most of the general patterns present in the bivariate analyses remain (Table 4). Age is no longer significantly associated with any of the self-care behaviors. Being female increases the odds of using OTC medicines for all participants and of using salt for all participants and dentate participants. Ethnicity remains consistently related to the use of OTC dental products and hydrogen peroxide, with both all and dentate African-American and American Indian older adults having two to three times the odds of using these self-care behaviors than white older adults. Dentate American Indian older adults have twice the odds of using salt compared to white older adults. Controlling for the other variables, older adults do not differ by ethnicity in the use of OTC medicine or in the use of complementary therapies. Education has little association with the use of the self-care behaviors.

The three strong patterns of association between number of teeth and self-care behaviors largely remain in the multivariate analysis. Among all participants, those with fewer teeth (0 or 1-10 versus more than 20) had lower odds of using hydrogen peroxide. Among all participants and dentate participants, those with fewer teeth (11-20 versus more than 20) had greater odds of using salt. Among all participants and dentate participants, those with fewer teeth had lower odds of using complementary therapies.

Many of the associations of oral health problems with the self-care behaviors remained in the multivariate analysis. The odds of using OTC medicine were greatly increased among all participants and dentate participants with oral pain and were greater among all participants with bleeding gums. The use of OTC dental products was greater among all participants with bad breath. The odds of using of hydrogen peroxide were greater among all participants with bleeding gems and dry mouth. Among all participants and dentate participants, the odds of using salt were greater among those with bleeding gums. The odds of using complementary therapies was greater among all participants with oral pain, bad breath, and bleeding gums. Among dentate participants, the odds of using complementary therapies were greater among those with bleeding gums but less among those with dry mouth. Ill-fitting dentures and stained teeth were not related to any of the self-care behaviors in the multivariate analyses.

DISCUSSION

Older adults use a wide variety of self-care behaviors. Many of these are OTC dental products and OTC medicine. These are adjuncts to professional care that may be recommended by a professional care provider. Salt, the most widely used specific, non-OTC product, may be a home remedy, but its use is also often recommended by a professional care provider. While a long list of potential self-care behaviors was elicited from focus groups by Cohen and colleagues (6), when asked about actual use, most older adults do not use them.

Research on medical self-care has focused largely on persons with chronic conditions, such as osteoarthritis and diabetes (14-17). Research in dental self-care has focused largely on how individuals address tooth pain (6,7,10). This analysis shows that the use of self-care is associated with several different oral health conditions in addition to tooth pain. Oral pain (which is the actual measure used in this analysis rather than tooth pain) is an important condition that evokes all of the major self-care behaviors included in this analysis. However, only 11 percent of the older adults in this study reported having oral pain, and the number of older adults using many of the self-care behaviors far exceeds the number of those who report experiencing oral pain. Bleeding gums also evoke the use of all the major self-care behavior categories included in this analysis, whereas dry mouth evokes all of the major self-care behavior categories other than complementary therapies, and stained teeth evoke the self-care behaviors of OTC medicine, hydrogenperoxide, and salt. To understand the process by which older adults and all adults implement self-care behaviors for oral health, and the interaction of those self-care behaviors with oral health for all adults, researchers must consider conditions in addition to pain.

This research has focused on older adults who generally have multiple health problems with which they must deal. It is likely that these older adults are using multiple self-care behaviors for conditions in addition to oral health problems. Analyses of dental self-care behaviors need to be considered in light of the other self-care behaviors in which older adults are engaged.

Some gender, ethnic, and class differences are apparent in the use of dental self-care behaviors. Greater use of OTC products for self-care by women and minority group members is consistent with other research (18,19). However, more important than gender or ethnicity, the use of dental self-care behaviors is driven largely by need. Those with oral pain, bleeding gums, and dry mouth are much more likely to engage in most of the dental self-care behaviors, including the use of complementary therapies. The reasons for lower use of hydrogen peroxide and complementary therapies by those with fewer teeth are not clear.

The use of complementary therapies can be an important component of self-care behaviors. A substantial body of research has begun to delineate the epidemiology of complementary therapies in the United States [e.g., (20)] and specifically among older adults (13). Virtually no research has documented the actual types of complementary therapies that are being used for oral health or the prevalence of these complementary therapies. Discounting self-care behaviors such as the use of salt and hydrogen peroxide, which may be prescribed by professional care providers, almost one-fifth of the rural older adults in this study used some form of complementary therapy. These older adults use a wide variety of complementary therapies, although no one complementary therapy is widely used. Some of these complementary therapies, like the use of temperature, baking soda, vinegar, vitamins, or minerals, may be innocuous. The use of other

complementary therapies, such as placing aspirin on affected areas and rinsing the mouth with toxic products (rubbing alcohol, chlorine bleach), is dangerous. Greater research is needed on the use of complementary therapies in dental self-care. Dental care providers need to discuss the use of complementary therapies with their patients.

The results of this analysis must be interpreted in light of specific limitations. The research on which this analysis is based used a cross-sectional survey design. Therefore, it is not possible to document causal relationships, and the results are subject to the recall bias of the participants. The research was conducted in two rural southern counties, and this may limit the generalization of results to adults in other regions. The survey questionnaire included a limited number of self-care behavior items. However, the research included a large, random, ethnically diverse sample. The survey questionnaire allowed for participants to volunteer self-care behaviors beyond the specified items.

This research shows that most rural adults engage in a variety of dental self-care behaviors, including the use of OTC products and complementary therapies. Minority group members engage in some self-care behaviors, particularly the use of OTC dental products, more than whites. However, the major factor leading to the use of self-care behaviors is need. Although oral pain does increase the use of self-care behaviors, so do bleeding gums and dry mouth. Investigators need to expand analysis of dental self-care behaviors and the relationship of self-care behaviors to the use of professional services. Further research is also needed to explore the use of complementary medicine in dental self-care.

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TABLES

Table 1: Participant Personal Characteristics and Oral Health Problems for the Weighted Study Sample

Participant characteristics	***n***	**%**
Total *n*	635	100.0
Age (Mean ± SE): 71.5 ± 0.4		
Female	343.8	54.1
Ethnicity		
African-American	135.9	21.4
American Indian	195.3	30.7
White	303.8	47.8
Education		
Less than high school	353.7	55.7
High school	155.8	24.5
More than high school	125.5	19.8
Has health insurance	593.5	93.5
Has dental insurance	64.1	10.1
Poverty		
Below poverty level	204.0	32.1
Above poverty level	431.0	67.9
Number of teeth		
None	221.7	34.9
1-10	105.2	16.6
11-20	130.6	20.6
21-32	177.6	28.0
Oral health problems		
Oral pain	69.4	10.9
Bad breath	126.2	20.0
Ill-fitting dentures	135.2	21.4
Bleeding gums	135.4	21.5
Dry mouth	308.8	48.6
Stained teeth (among dentate)	178.5	43.4

SE, standard error.

Table 2: Self-Care Behaviors Used for Oral Health among Rural Older Adults

Self-care behaviors	*n*	%
OTC medicine*	77.4	12.2
OTC dental products*	533.4	84.0
Hydrogen peroxide	179.1	28.2
OTC gels and salves	67.6	10.6
Denture products	137.3	21.6
Special toothpaste	8.7	1.4
Mouthwash	494.4	77.9
Other	0.4	0.1
Prescription medicine*	5.7	0.9
Salt*	323.2	50.9
Prayer*	38.4	6.0
Complementary therapies	115.9	18.2
Tea bags/herbs*	12.3	1.9
Herbs or teas	9.5	1.5
Tobacco	3.3	0.5
Hot/cold (ice)*	34.8	5.5
Placing aspirin on the affected area*	20.8	3.3
Massaging gums*	0.3	0.04
Liquor*	2.9	0.5
Spices*	6.3	1.0
Vanilla extract	5.2	0.8
Other	2.7	0.4
Rinsing mouth with toxic substances*	28.9	4.5
Other home remedies	33.4	5.3
Epsom salts	2.8	0.4
Baking soda	24.7	3.9
Vinegar	2.7	0.4
Mechanical	1.1	0.2
Other	4.6	0.7
Vitamins and minerals	7.6	1.2
Vitamins	7.6	1.2
Minerals	2.0	0.3
Relaxation techniques	5.1	0.8

*Behaviors delineated by Cohen and colleagues (6).
OTC, over the counter.

Table 3: Bivariate Associations of Personal Characteristics and Oral Health Problems with Self-Care Behaviors used for Oral Health among Rural Older Adults

Personal characteristics and oral health problems	OTC medicine			OTC dental products			Hydrogen peroxide			Salt			Complementary therapies		
	Odd ratios	95% confidence intervals		Odd ratios	95% confidence intervals		Odd ratios	95% confidence intervals		Odd ratios	95% confidence intervals		Odd ratios	95% confidence intervals	
Age	0.96	0.93	0.99				0.97	0.950	0.99						
Female versus male	2.49	1.47	4.21							1.72	1.26	2.36			
Ethnicity															
African-American versus white	2.18	1.17	4.07	3.03	1.57	5.83	2.91	1.839	4.60						
American Indian versus white	2.31	1.31	4.05	2.30	1.37	3.87	3.12	2.064	4.73	1.98	1.37	2.86			
Education															
<HS versus >HS	2.81	1.31	6.02				1.68	1.030	2.73	1.97	1.30	2.98			
HS versus >HS															
Poverty															
Number of teeth															
0 versus >20	0.43	0.22	0.81				0.55	0.350	0.85	1.66	1.11	2.47	0.41	0.25	0.68
1-10 versus >20							0.56	0.323	0.98				0.39	0.20	0.75
11-20 versus >20				2.27	1.10	4.70				2.00	1.27	3.17	0.52	0.30	0.91
Oral pain	12.63	7.18	22.23	2.96	1.12	7.87	3.20	1.927	5.32	2.05	1.21	3.47	2.51	1.45	4.33
Bad breath	3.15	1.90	5.22	5.82	2.31	14.71	2.39	1.592	3.59				1.70	1.07	2.70
Ill-fitting dentures										1.51	1.03	2.22			
Bleeding gums	3.35	2.04	5.52	2.23	1.19	4.19	2.69	1.807	4.01	3.57	2.34	5.45	1.80	1.15	2.83
Dry mouth	1.78	1.09	2.89				2.03	1.424	2.88	1.72	1.25	2.35			
Stained teeth (dentate only)	2.93	1.64	5.23				1.55	1.015	2.35	1.80	1.21	2.67			

OTC, over the counter

Table 4: Multivariate Logistic Models of Personal Characteristics and Oral Health Problems with Self-Care Behaviors Used for Oral Health among Rural Older Adults

	All participants					Dentate participants				
Personal characteristics and oral health problems	**OTC medicine Odds ratio (95% CI)**	**OTC dental products Odds ratio (95% CI)**	**Hydrogen peroxide Odds ratio (95% CI)**	**Salt Odds ratio (95% CI)**	**Comp. therapies Odds ratio (95% CI)**	**OTC medicine Odds ratio (95% CI)**	**OTC dental products Odds ratio (95% CI)**	**Hydrogen peroxide Odds ratio (95% CI)**	**Salt Odds ratio (95% CI)**	**Comp. therapies Odds ratio (95% CI)**
Age										
Female versus male	2.06 (1.14, 3.75)			1.64 (1.16, 2.31)					1.60 (1.01, 2.54)	
Ethnicity (versus white)										
African-American		2.35 (1.31, 4.20)	3.17 (1.97, 5.10)				2.31 (1.01, 5.25)	3.47 (1.95, 6.18)		
American Indian		2.76 (1.38, 5.51)	3.09 (1.86, 5.12)				2.58 (1.01, 6.60)	3.33 (1.82, 6.09)	2.02 (1.18, 3.44)	
Education (versus >HS)										
<HS	2.86 (1.19, 6.90)	0.44 (0.22, 0.89)								
HS										
Number of teeth (versus >20)										
0			0.40 (0.23, 0.71)		0.31 (0.17, 0.58)	–	–	–	–	–
1-10			0.52 (0.28, 0.96)		0.33 (0.16, 0.67)					0.29 (0.14, 0.61)
11-20				1.96 (1.18, 3.26)	0.37 (0.20, 0.68)				2.02 (1.18, 3.46)	0.36 (0.19, 0.68)
Oral pain	6.77 (3.47, 13.21)				1.96 (1.03, 3.71)	6.79 (3.18, 14.46)				
Bad breath		4.35 (1.66, 11.42)			1.78 (1.04, 3.04)					
Ill-fitting dentures					1.78 (1.01, 3.14)					
Bleeding gums	1.96 (1.05, 3.66)		1.88 (1.18, 3.01)	2.70 (1.69, 4.30)	2.02 (1.19, 3.45)				3.73 (1.88, 7.39)	2.31 (1.16, 4.58)
Dry mouth			1.59 (1.06, 2.40)							0.42 (0.24, 0.74)
Stained teeth (dentate only)	–	–	–	–	–					

OTC, over the counter; CI, confidence interval; HS, high school