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California Dentists' Engagement in Media Advocacy for Sugar Restriction Policies

C.E. Kearns[1,2], J. Urata[2], and B.W. Chaffee[2]

Abstract: ***Objectives:*** *Increasing dentists' visibility in the media to make the case for sugary beverage taxes can help advance public policy that improves oral health outcomes. We assessed California dentists' media engagement behaviors related to sugar restriction policies for dental caries prevention and correlates of engaging in such behavior.*

Methods: *Survey items related to sugar policies and media engagement were embedded in an electronically distributed statewide survey of dentists' tobacco cessation counseling behaviors. Descriptive statistics were calculated for respondent characteristics, perceived professional responsibility to discuss selected topics with patients, and attitudes and behaviors related to sugar restriction policy and media communication. Multivariable models identified independent correlates of media engagement.*

Results: *Of 624 respondents, most had never talked to traditional media (78%) or posted to social media (64%) about sugar or sugar policies for dental caries prevention. Respondents with the highest level of media engagement were more likely to agree that sugary beverage taxes are effective at reducing dental caries, that they had support from dental professional organizations to talk to the media, that it is realistic for patients to reduce their sugar consumption, and that sugar and sugary drinks are extremely harmful to health.*

Conclusions: *Efforts to increase dentists' media engagement related to sugar restriction policies for dental caries prevention should address dentists' negative attitudes toward the effectiveness of sugar restriction policies and may require increased support from dental professional societies.*

Knowledge Transfer Statement: *Study findings identify dentists' low engagement in media advocacy to support sugar restriction policy adoption. The results identify correlates of media engagement and of dentists' willingness and confidence to act, which could serve to inform interventions to support and enhance engagement.*

Keywords: role of dentist, sugars, diet, surveys, dental caries, nutrition policy

Introduction

Public health experts and consumer groups began calling for excise taxes on sugar-sweetened beverages (SSBs) in the 1990s and early 2000s (Jacobson and Brownell 2000). Among their concerns were that the economic costs of diet-related diseases, including coronary heart disease, cancer, stroke, and diabetes, had been estimated at $71 billion annually (Frazão 1999) and that the soft drink industry was spending 600 times more on advertising than government-sponsored health promotion programs (Jacobson and Brownell 2000). Building on the success of tobacco taxation and buoyed by favorable economic analyses, excise taxes, which could be applied specifically to SSBs and collected from producers and embedded in the price to consumers, were seen as a feasible and effective solution to reduce consumption (and subsequent diet-related disease burdens) and generate revenue for health-related programs. In 2009, US Senate leaders considered a federal SSB

DOI: 10.1177/23800844211003818. [1]Philip R. Lee Institute for Health Policy Studies, University of California San Francisco, San Francisco, CA, USA; [2]Division of Oral Epidemiology and Dental Public Health, School of Dentistry, University of California San Francisco, San Francisco, CA, USA. Corresponding author: C.E. Kearns, Philip R. Lee Institute of Health Policy Studies, University of California San Francisco, 3333 California Street, ST. 265, San Francisco, CA 94118, USA. Email: cristin.kearns@ucsf.edu

excise tax as a means to help fund the Affordable Care Act (Adamy 2009) but never officially proposed it, assumedly due to the influence of soft drink companies and the American Beverage Association spent $40.3 million lobbying the federal government that year (Center for Science in the Public Interest 2016).

California is illustrative of the several states and municipalities that began considering their own SSB excise tax proposals in the following decade. Between 2010 and 2020, California proposed numerous SSB tax initiatives at the state and local levels, as well as related initiatives such as warning labels, with varying success. Berkeley became the first city in California (and the United States) to pass an SSB excise tax of $0.01 per fluid ounce in 2014 (Healthy Berkeley 2020), and 3 additional California cities passed similar SSB taxes in 2016 (Knight 2016). Opposition to SSB taxes in California has been fierce. Between 2009 and September 2016, the American Beverage Association (ABA) spent $20 million to counter state and local proposals (Center for Science in the Public Interest 2016). In 2018, using sophisticated political maneuvering, the ABA orchestrated a statewide ban on new local SSB taxes in California for 12 y (Dillon 2018).

In 2016, organizers of the Joint European Organisation for Caries Research and European Association of Dental Public Health Symposium on Sugar acknowledged that, globally, most dentists have focused on applying different forms of fluoride and fissure sealants to control dental caries but not on reducing sugar intake (Schulte and Tsakos 2019). The same year, experts from the Berkeley Media Studies Group urged oral health professionals across California to elevate their expert voices and engage in media advocacy to help make the case for SSB taxes (Somji et al. 2016). Their analysis of news coverage, social media, and campaign materials related to the concurrent 2014 SSB tax proposals in Berkeley and San Francisco found that tax proponents regularly made the case for SSB taxes using health-related arguments but that oral health was rarely included (Somji et al. 2016). Diabetes was discussed 17 times more frequently and obesity 19 times more frequently than the oral health consequences of SSB consumption. Oral health experts were almost entirely absent from the media examined. Dentists have historically been targeted by sugar industry public relations campaigns designed to minimize their involvement in advocacy for sugar restriction policies as a means to control dental caries (Kearns et al. 2019); however, no study, to our knowledge, has explored correlates of dentists' engagement in media advocacy behaviors related to sugar and sugar restriction policy.

California dentists have had important involvement with SSB tax proposals. The Berkeley Dental Society was a major supporter of Berkeley's tax proposal, and a local dentist was part of the city's new expert panel recommending how to allocate funds collected (Dugdale 2015). The California Dental Association (CDA) began supporting SSB tax proposals in 2016 (Open Disclosure Oakland 2016) and would go on to introduce a suite of unsuccessful bills in 2019 that would have limited promotional pricing incentives used by the beverage industry to heavily subsidize discounts on SSBs, prohibited placement of SSBs near the checkout counter at supermarkets, and banned the sale of unsealed beverages larger than 16 oz at food service establishments (California Dental Association 2019; McGreevy 2019). In a contested policy environment, dentists acting individually and collectively have potential to add oral health arguments for SSB taxes to the public discourse that could lead to increased support (Somji et al. 2016) and, ultimately, to improved oral health outcomes (Schwendicke et al. 2016; Jevdjevic et al. 2019).

This present study sought to explore California dentists' engagement in media advocacy related to SSB taxes and factors associated with engagement. Specifically, the objectives of this analysis were to 1) describe California dentists' media engagement related to sugar, sugar guidelines, and sugar restriction policy and 2) identify correlates of media engagement, with specific attention to dentists' confidence and willingness related to contributing to social media and talking with traditional media and attitudes toward sugar and sugar restriction policies for dental caries prevention.

Methods

The present analysis examines of set of survey items related to sugar policies and media engagement that were embedded within a study of dentists' engagement in patient tobacco cessation counseling, as described previously (Chaffee et al. 2020). A web-based cross-sectional survey was distributed via email in fall 2018 to a sample of 7,752 CDA members of the approximately 26,000 dentists in the online member directory. After clicking an emailed link, respondents viewed a description of the survey, research purpose, and voluntary nature of the research, including a statement that continuing the survey implied electronic consent. Participants were asked whether they currently practiced at least part-time and to verify their age (18 y or older) and were deemed ineligible and routed to exit the survey if a negative answer was given. Median completion time was 15 min. Survey participants had the option to receive a code for a $10 credit at an online retailer upon completion. The Institutional Review Board of the University of California, San Francisco approved all study procedures (Protocol 18-25929). Study reporting followed Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement guidelines.

Participants

The local dental society component was used to stratify the sample, with oversampling from components with fewer members (generally, membership size is smallest in rural areas). Student or retired members were excluded.

Reminders were sent after 3, 7, and 16 d. Of the 7,752 surveys sent, 83 were returned as undeliverable due to an invalid address. In total, 752 participants answered both eligibility questions (response percentage: 752/7,669 = 9.8%), and 725 were deemed eligible (92.6% of ineligible were not in clinical practice). The study was originally designed with a target sample size of 700 to provide 90% power to detect differences in providing tobacco cessation assistance between selected respondent groups (e.g., more or less clinical experience) (Chaffee et al. 2020). Dentists' media engagement related to sugar was assessed secondarily.

Measurement

The development and piloting of the tobacco cessation attitudes and behaviors questionnaire are described elsewhere (Chaffee et al. 2020). To capture attitudes and practices related to sugar, sugar restriction policy, and media advocacy for the present study, novel items were developed following the same framework as existing items related to dentists' current behaviors and willingness to engage in patient tobacco cessation counseling. Two novel items were also developed to explore the prevalence of attitudes toward sugar and oral health promoted by the sugary food and beverage industry (that it is not realistic for patients to reduce their sugar intake, and SSB taxes are not effective for dental caries prevention).

The main outcomes of interest were dentists' media advocacy behaviors. Participants responded to the following prompts: "How often have you posted to social media, made a blog post, or written on a website about sugar, sugar guidelines, or sugar restriction policies for dental caries prevention? (Include your professional website and social media accounts, if applicable)" and "How often have you talked to *traditional* media about sugar, sugar guidelines, or sugar restriction policies for dental caries prevention? (For example, talked to a reporter, wrote an editorial, or were interviewed)" (options: multiple times per year, once or twice in my life, never). Dentists were also asked, "How confident are you in your ability to talk with the traditional media about sugar restriction policies?" (very, somewhat, or not confident) and "How willing would you be to communicate publicly about sugar restriction policies?" (very, somewhat, or not willing) regarding personal social media, professional social media or websites, and traditional media. Alongside the tobacco cessation items, invited dental professional organization leaders reviewed all sugar policy and media engagement items for face validity prior to pilot testing among a convenience sample of 21 dental practitioners.

To create a single outcome measure to capture overall engagement with the media about sugar policy, all media engagement items (i.e., making social media posts, communicating with traditional media, and 1 confidence and 3 willingness items about doing so) were combined into a simple additive scale (6 items, 3 levels each). Items had strong internal consistency (Cronbach's α = 0.80, unweighted sample), supporting scale construction.

The primary predictor variables of interest were dentists' perceptions regarding harms of sugar, sugar policies, and their professional responsibility and support to discuss sugar with patients. Specifically, respondents were asked, "How harmful do you think added sugars in foods or drinks are to health?" (5 response options from not at all to extremely harmful); "How effective do you think reducing sugar consumption is for reducing dental caries risk?" and "How effective do you think sugary beverage taxes are in reducing dental caries rates?" (very, somewhat, or not effective); "How realistic do you think it is for patients to reduce their sugar consumption?" (very, somewhat, or not realistic); "How much do you agree that it is your professional responsibility to discuss [9 topics presented, including 'sugars and sugary drinks'] with dental patients?" (4 options from strongly disagree to strongly agree); and "Do you have available support from dental professional organizations for talking publicly about sugar restriction policies?" (definitely yes, somewhat, no).

Statistical Analysis

The present analysis was restricted to participants who completed all items related to sugar, sugar policies, and media engagement (N = 624). Descriptive statistics for participant and practice characteristics, self-reported behaviors, and attitudinal concepts were calculated for this analytic sample. We compared media engagement scores according to respondents' characteristics, perceptions about added sugars' harm to health, attitudes about sugar restriction and caries, and perceived professional society support to communicate publicly about sugar restriction in univariable and multivariable negative binomial models. Finally, in an exploratory analysis of correlates of sugar and sugar policy attitudes, we fitted 2 ordered logistic regression models where the outcome variables were dentists' responses regarding how realistic it is for patients to reduce sugar consumption and how effective sugary beverage taxes are in reducing dental caries rates. In all multivariable models, missing covariable data (0.3%) were multiply imputed using chained equations with the mi command suite in Stata 16 (StataCorp). Survey responses and all models were weighted by the inverse of the local dental society component-specific sampling probability and response percentage to obtain geographically representative statewide estimates using the svy command suite, as detailed elsewhere (Chaffee et al. 2020). Results were considered statistically significant if 95% confidence intervals excluded the null value.

Results

Most respondents worked in private practice (89.4%), did not accept Medicaid (73.3%), and were located in an urban setting (89.7%) (Table 1). The gender balance, 59.9% male and 40.0% female, was similar to statewide

Table 1.
Participant and Practice Characteristics, California Dentists.

Characteristic	*n*	Weighted %	Unweighted %
Gender			
Male	382	59.9	61.5
Female	239	40.0	38.5
Race/ethnicity			
Non-Hispanic White	272	40.0	43.8
Asian	227	40.4	36.6
Other	86	14.1	13.8
Hispanic/Latino	36	5.5	5.8
Years in practice			
0–5 y	99	14.0	15.7
6–20 y	217	42.0	34.4
≥21 y	314	44.0	49.8
Practice type			
Private practice	548	89.4	87.0
All others	82	10.6	13.0
Medicaid provider			
Does not accept	462	73.3	73.3
Accepts Medicaid	168	26.7	26.7
Practice setting			
Urban	505	89.7	81.6
Rural/partially rural	114	10.3	18.4

Weighted percentages incorporate sampling design and nonresponse. Restricted to participants who answered all survey items about sugar policies and media engagement about sugar ($N = 624$).

percentages reported by the American Dental Association (ADA) (American Dental Association Health Policy Institute 2020). Participants identified in equal percentages as non-Hispanic White (40.0%), substantially lower than the ADA reported percentage in California, and Asian (40.4%), substantially higher than the ADA data (American Dental Association Health Policy Institute 2016). Participants were also relatively evenly split between 6 and 20 y in practice (42.0%) and greater than 21 y (44.0%), with 14% of participants having practiced 0 to 5 y.

Most dentists reported limited past experience communicating about sugar or sugar policies for dental caries prevention via social or traditional media (Table 2). The majority (64.0%) had never posted to social media, and most (78.7%) had never talked to the traditional media on this topic. Very few (12.9% and 5.8%) reported engaging with either media, respectively, multiple times per year. Nearly one-third of respondents (30.9%) were not confident in their ability to talk with traditional media about sugar restriction policies while 46.5% were somewhat and 22.6% very confident. Even more respondents were not willing to post/comment on personal social media (41.0%) or on professional social media/websites (32.4%), and 39.6% were not willing to talk to traditional media about sugar or sugar policies for dental caries prevention.

Regarding health effects, nearly three-quarters of respondents (72.3%) perceived added sugars in food and drinks as extremely or very harmful to general health (Table 3). Similarly, the majority (76.1%) believe that reducing sugar consumption to reduce dental caries risk is very effective. When asked about discussing selected topics in their practice, the majority of respondents (68.9%) strongly agreed it was their professional responsibility to discuss sugars and sugary drinks with their patients. However, most also believed it is only somewhat (68.0%) or not (15.7%) realistic for individuals to reduce their sugar consumption. Nearly half of respondents (47.8%) believed a sugary beverage tax would not be effective for reducing caries, and an additional 39.9% believed a tax would be only somewhat effective. The majority of respondents agreed that support from dental professional organizations to communicate publicly about sugar restrictions was only somewhat (41.3%) or not (38.3%) available.

Respondents' media engagement scores differed according to perceptions about sugar/sugary drinks, sugar restriction policies, professional responsibilities, and dental professional organization support (Table 4). Respondents with the highest level of media engagement were those that agreed that sugary beverage taxes are very effective at reducing dental caries rate, that they definitely had support from dental professional organizations to talk to the media, that it is very realistic for patients to reduce their sugar consumption, and that sugar and sugary drinks are extremely harmful to health. For every perception about sugar and sugar policy measured, dentists' media engagement was lowest among respondents with the most pessimistic views about modifying patient behaviors and engaging in sugar policy.

Table 2.
California Dentists' Media Advocacy Behaviors Related to Sugar, Sugar Restriction Policy, and Confidence and Willingness to Perform Them.

Behaviors: Communicate Publicly about Sugar Restriction	Multiple Times/y, %	Once or Twice in Life, %	Never, %
How often posted to social media, blog, or website about sugar or sugar policies for dental caries prevention?	12.9	23.1	64.0
How often talked to traditional media about sugar or sugar policies for dental caries prevention?	5.8	15.6	78.7
Confidence: Communicate Publicly about Sugar Restriction	**Very, %**	**Somewhat, %**	**Not, %**
Confident to talk with the traditional media like newspaper	22.6	46.5	30.9
Willingness: Communicate Publicly about Sugar Restriction	**Very, %**	**Somewhat, %**	**Not, %**
Willing to post/comment on personal social media	22.7	36.2	41.0
Willing to post/comment on professional social media/website	29.8	37.8	32.4
Willing to talk with the traditional media like newspaper	20.4	40.0	39.6

Weighted percentages incorporate sampling design and nonresponse.

Table 3.
California Dentists' Attitudes about Sugar, Sugar Restriction Policies, and Support for Media Communication.

Harmfulness of Sugar to Overall Health	Extremely, %	Very, %	Some Slight None, %
How harmful are added sugars in food and drinks to health	25.1	47.2	27.7
Sugar Restriction and Caries	**Very, %**	**Somewhat, %**	**Not, %**
Effective: reducing sugar consumption to reduce caries risk	76.1	22.1	1.8
Realistic for patients: reduce their sugar consumption	16.2	68.0	15.7
Effective: sugary beverage taxes to reduce caries rates	12.4	39.9	47.8
Support to Communicate Publicly about Sugar Restriction	**Definitely, %**	**Somewhat, %**	**No, %**
Available support from dental professional organizations	20.4	41.3	38.3
Professional Responsibility to Discuss Topic with Patients[a]	**Strongly Agree, %**	**Somewhat Agree, %**	**Somewhat or Strongly Disagree, %**
Caries risk factors	79.5	14.5	6.0
Fluoride and fluoridation	75.3	16.6	8.1
Oral cancer risk factors	74.1	17.9	8.0
Sugars and sugary drinks	68.9	23.5	7.5
All forms of tobacco use	50.8	35.9	13.3
Chronic conditions like diabetes, hypertension	44.6	37.6	17.8
Getting the human papillomavirus vaccine (adolescents)	25.1	32.1	42.8
Maintaining a healthy weight	23.9	40.8	35.4
Cannabis/marijuana	20.0	47.5	32.5

Weighted percentages incorporate sampling design and nonresponse.
[a]Order of topic presentation was individually randomized within the survey.

Table 4.
Correlates of Engaging in Media Communication about Sugar Restriction Policies for Dental Caries Prevention.

Characteristic	*n*	Mean Media Engagement Score	*P* Value[a]	Adjusted Media Engagement Ratio[b] (95% CI)	*P* Value
Effective: reducing sugar consumption to reduce caries risk					
Very	475	4.5	Reference	Reference	Reference
Somewhat/not	154	3.6	0.024	0.77 (0.61–0.96)	0.021
Realistic for patients: reduce their sugar consumption					
Very	114	5.4	Reference	Reference	Reference
Somewhat	400	4.3	0.039	0.83 (0.68–1.00)	0.049
Not	115	3.3	<0.001	0.64 (0.50–0.83)	0.001
Effective: sugary beverage taxes to reduce caries rates					
Very	81	6.4	Reference	Reference	Reference
Somewhat	251	5.9	<0.001	0.64 (0.52–0.79)	<0.001
Not	297	4.0	<0.001	0.63 (0.52–0.76)	<0.001
Support from dental professional organizations to talk to media					
Definitely	140	6.4	Reference	Reference	Reference
Somewhat	260	5.5	<0.001	0.73 (0.62–0.85)	<0.001
No	227	3.0	<0.001	0.48 (0.39–0.58)	<0.001
Perceived harmfulness of sugar/sugary drinks					
Extremely	166	5.2	Reference	Reference	Reference
Very	284	4.1	0.008	0.78 (0.66–0.92)	0.004
Some/slight/none	178	3.8	0.003	0.74 (0.60–0.92)	0.007
Professional responsibility to discuss sugars with patients					
Strongly agree	443	4.7	Reference	Reference	Reference
Do not strongly agree	183	3.4	<0.001	0.74 (0.62–0.89)	0.003

Weighted scores and models incorporate sampling design and nonresponse.
[a]*P* values to compare unadjusted means from linear weighted regression models with no covariables (test for significant difference from reference category).
[b]Ratio of engagement score relative to reference. Each independent variable shown in the table modeled separately with adjustment for gender, race/ethnicity, years in dental practice, participation in the Medicaid dental program, and practice setting (i.e., urban vs. rural/partially rural).

Dentists who agreed that sugar/sugary drinks are harmful, believed that it was their professional responsibility to discuss sugar and sugary drinks with their patients, and felt supported by dental professional organizations for talking publicly about sugar restriction policies had numerically greater odds, albeit not statistically significantly, of being in a stronger agreement category that it was realistic for patients to reduce their sugar intake and that SSB taxes are effective for reducing dental caries rates (Table 5). The strongest and only statistically significant association was between respondents' views about support from professional organizations and agreement that SSB taxes are effective at reducing dental caries rates.

Discussion

The majority of California dentists reported that they have never talked with

Table 5.
Exploratory Analysis of Correlates of Sugar and Sugar Restriction Policy Attitudes Promoted by the Sugary Food and Beverage Industry, a Multivariable Model.

Characteristic	Odds Ratios (95% CI)	
	Realistic for Patients to Reduce Sugar Intake	SSB Taxes Effective at Reducing Caries Rates
Perceived harm: sugar/sugary drinks		
Extremely harmful	Reference	Reference
Very harmful	1.07 (0.63–1.81)	0.97 (0.58–1.60)
Not/slightly/somewhat harmful	0.58 (0.31–1.07)	0.70 (0.41–1.21)
Professional responsibility to talk about sugar		
Strongly agree	Reference	Reference
Do not strongly agree	0.82 (0.52–1.27)	0.75 (0.49–1.17)
Supported by professional organization		
Very	Reference	Reference
Somewhat	0.81 (0.44–1.48)	0.37 (0.21–0.67)
No	0.58 (0.31–1.08)	0.34 (0.19–0.63)
Gender		
Male	Reference	Reference
Female	0.64 (0.42–0.98)	1.05 (0.65–1.69)
Race/ethnicity		
Non-Hispanic White	Reference	Reference
Asian	0.74 (0.45–1.19)	1.33 (0.84–2.11)
Other (including Hispanic/Latino)	1.09 (0.57–2.09)	1.14 (0.57–2.28)
Years in practice		
0–5 y	Reference	Reference
6–20 y	0.80 (0.44–1.45)	1.05 (0.54–2.01)
≥21 y	0.88 (0.49–1.57)	0.73 (0.38–1.39)
Medicaid provider		
Does not accept	Reference	Reference
Accepts Medicaid	0.80 (0.50–1.27)	1.30 (0.80–2.11)
Practice setting		
Urban	Reference	Reference
Rural/partially rural	0.91 (0.51–1.64)	0.66 (0.38–1.14)

Weighted models incorporate sampling design and nonresponse. Positive odds ratio indicates greater odds of giving a more positive response (i.e., more realistic, more effective).
SSB, sugar-sweetened beverage.

the media or posted to social media, a blog, or website about sugar or sugar policies for dental caries prevention. Our results align with the Berkeley Media Studies Group findings that oral health experts were largely absent from media coverage of the 2014 SSB tax proposals in Berkeley and San Francisco (Somji et al. 2016) and offer additional insight into why this was so. In our study, dentists' perceptions about whether it is realistic that patients would reduce their sugar consumption, whether SSB taxes are effective at reducing caries rates, whether SSBs are extremely harmful to health in general, and whether they had support from dental professional organizations to talk to the media were all positively associated with dentists' media engagement. While these results must be interpreted cautiously given the limited target geographic region and modest survey response percentage, the findings provide novel insight into dentists' opinions on sugar policy and how those viewpoints correlate with engagement in public discourse.

Dentist characteristics, such as age and years of education, had little impact on their media engagement; however, it is possible that other characteristics not measured could have influenced behavior. Dentists' generally conservative political views (Center for Responsive Politics 2020) may make them more likely to be skeptical of government interventions. Limited exposure to training in community factors and in social determinants of health during dental education and practice (Tiwari and Palatta 2019) may also play a role. Dentists may be concerned that expressing policy opinions publicly may harm their business. Another possibility is that dentists have been susceptible to sugary food and beverage industry public relations campaigns. These campaigns have disseminated messages that SSBs are less harmful to teeth than sticky foods and that SSB taxes are not effective for dental caries prevention (Kearns and Watt 2019; Kearns et al. 2015, 2019).

Most dentists believe that sugar and sugary drinks are harmful to general health and strongly agree that reducing sugar consumption to reduce dental caries risk is very effective and that it is their professional responsibility to discuss sugars and sugary drinks with their patients. This likely reflects the overwhelming evidence that sugars are the most important dietary factor in the development of dental caries (Sheiham and James 2015) and an educational emphasis on providing chairside oral health instruction and nutritional counseling (Touger-Decker and Mobley 2013). However, in contrast, most dentists felt it is only somewhat or not realistic that individuals would reduce their sugar consumption. This, again, is another message that has been consistently disseminated by the sugary food and beverage industry for decades (Kearns and Watt 2019; Kearns et al. 2015, 2019).

Dentists' pessimism about SSB taxes being effective in reducing dental caries rates could also reflect a lack of agreement among dental professional organizations on these topics. For example, although the California Dental Association began supporting sugar restriction policies in 2016 (Open Disclosure Oakland 2016), the year prior, the American Dental Association questioned whether singling out individual foods and beverages for regulation is likely to decrease caries rates in its comment on the 2015 US Dietary Guidelines (American Dental Association 2015).

Our findings suggest that support from dental professional organizations to talk with the media about sugar restriction policies may play a key role in dentists' media engagement in 2 important ways. Dentists who felt supported were more likely to be confident and willing to engage, as well as to have participated in talking with the media. They were also more likely to believe it was realistic for patients to reduce their sugar intake and that SSB taxes are effective for reducing dental caries rates.

Although there is a current moratorium on new municipal SSB taxes in California, this does not preclude future state SSB restriction policy proposals or other local non-tax-related SSB restriction policy proposals (e.g., warning labels, banning large fountain drinks). With a long history of supporting community water fluoridation under conditions of public initiative and referenda that are often highly contested (US Department of Health and Human Services, Centers for Disease Control and Prevention 2003), dentists and their professional networks in California and elsewhere have strong potential to increase their sugar restriction policy media advocacy. Dental organizations, including professional societies, could consider collating the growing evidence related to improvements in oral health outcomes associated with SSB policy implementation, disseminating policy fact sheets and responses to common industry arguments to local dental societies to encourage consistent messaging, and sponsoring media training for local dentist leaders. Early examples of this include the Association of State and Territorial Dental Directors Policy Statement on Sugar-Sweetened Beverages (Association of State and Territorial Directors 2019) and the International Association of Dental Research/American Association of Dental Research Policy Statement on Sugar Sweetened Beverages (International Association for Dental Research 2020). However, concerted efforts to unite dental organizations around support of SSB policies will also likely be required to ensure that dentists are exposed to consistent messaging in the United States and internationally.

This study has several strengths. The survey is weighted for statewide representation. It was also presented to respondents as being about tobacco, so sugar-related beliefs were unlikely to be biased by self-selection by individuals with strong opinions about sugar policy. To our knowledge, this is the first study to evaluate dentists' attitudes about SSB policy and media engagement.

Study limitations include a relatively low response percentage and that media engagement behaviors were

measured by self-report and by survey items developed for this investigation without prior external validation. The sample size was limited for some analyses (notably the exploratory analysis of correlates of policy attitudes), as the study was originally powered for a different purpose (i.e., tobacco cessation counseling). Nonrespondents to the online survey may be less likely to be active in social media and other media engagement than those who completed the survey, suggesting that the proportion of dentists engaged in media advocacy is lower than reported here. In addition, the survey measured reported media engagement behaviors, not actual behaviors, suggesting that some overreporting of media engagement behaviors may have occurred. Measurement items introduced in this survey warrant further development and validity testing. Although this study was limited to California, and results might not generalize to contexts where SSB taxation has been less prominently debated, it can inform hypothesis generation for future studies on a larger scale and different policy environments. Differences by dental specialty could also be examined in future work, as this sample lacked adequate statistical power for comparisons by specialty.

Conclusion

Dentists are well positioned to engage in advocacy to increase support for sugar restriction policies at state and local levels, but a number of barriers will need to be overcome to increase media engagement. Challenges include negative attitudes toward the likelihood of behavior change and the effectiveness of SSB taxes to decrease dental caries risk, as well as perceived lack of support from dental professional organizations. Dental professional organizations can build on dentists' strong beliefs that it is their professional responsibility to discuss sugars and sugary beverages with their patients by collating and disseminating evidence about the effectiveness of sugar restriction policies to reduce dental caries risk and providing counterarguments to beverage industry challenges. They can also sponsor media training to improve media advocacy skills. Dentists and dental organizations should also consider the possibility that messages disseminated through sugary food and beverage industry public relations campaigns have been adopted within the profession and identify strategies to counter these messages.

Author Contributions

C.E. Kearns, contributed to conception, design, data analysis and interpretation, drafted and critically revised the manuscript; J. Urata, contributed to data acquisition and analysis, critically revised the manuscript; B.W. Chaffee, contributed to conception, design, data acquisition, analysis, and interpretation, drafted and critically revised the manuscript. All authors gave final approval and agree to be accountable for all aspects of the work.

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ORCID iD

C.E. Kearns https://orcid.org/0000-0001-6885-2304

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