Advancing oral health policy and advocacy to prevent childhood obesity and reduce children's consumption of sugar-sweetened beverages

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Abstract

Purpose: While a large body of work documents the interconnections between oral health and obesity, less is known about the role that oral health professionals and organizations play to prevent childhood obesity, especially by influencing children's consumption of sugar-sweetened beverages (SSBs). This review identifies efforts by oral health professionals and organizations to influence such policy and advocacy, while informing future opportunities to leverage and expand on existing efforts.
Methods: A scoping review of peer-reviewed literature and a web-based review of oral health policy and advocacy initiatives addressing prevention of obesity and reducing children's consumption of SSBs were conducted. Of 30 unique references identified, four peer-reviewed and seven non-peer-reviewed references met selection criteria. Qualitative and quantitative data were extracted using a priori determined headings.
Results: Findings suggest a strong role for oral health professionals in preventing childhood obesity and reducing children's consumption of SSBs; however, only a few national, state, and local oral-health-advocacy and -policy efforts were identified, such as policy statements by national associations, state and local education campaigns, and clinical guidelines. Evidence was limited on the role of oral health professionals in influencing broader communitywide advocacy and policy efforts such as soda taxation and limiting SSB consumption in schools.
Conclusion: This review provides an emerging evidence base to support growing recognition among oral health professionals of their dual role in preventing childhood obesity and dental caries by targeting SSB consumption. It also identifies opportunities for oral health professionals to build on initial efforts to more proactively influence future policy and advocacy.

Introduction

Childhood obesity rates have tripled in the past three decades in the United States, and the country has some of the highest rates in the world. In 2012, 8.4 percent of children ages 2–5 and 17.7 percent of children ages 6–11 were obese (1). Meanwhile, the worldwide prevalence of childhood obesity increased from 5.0 percent in 2000 to 6.3 percent in 2013 (2). Childhood obesity is rooted in complex interactions of multiple unmodifiable (genetic, endocrinal, and neurological) and modifiable (socioeconomic status, environment, diet, and physical activity) factors. One modifiable factor is dietary choices, which includes the consumption of carbohydrate-rich beverages, also referred to as sugar-sweetened beverages (SSBs) (3). SSBs such as sodas, sports drinks, fruit drinks, sweetened teas, punches, and other sweetened beverages are the largest source of added sugar in the U.S. diet. Research has established the role of increased SSB consumption as one of the main factors leading to the obesity epidemic (3-5).

Over the past three decades, the consumption of fruits and vegetables in the United States has decreased, and the consumption of SSBs has steadily increased (4). This is of great

concern given the detrimental effects of SSB consumption on oral health, physical health, and quality of life – especially for children. While public health programs and policies have gained momentum in recent years to reduce SSB consumption, significant knowledge gaps remain on the most effective national, state, and local policy and economic vehicles (5). It is also less clear what role individuals and organizations in other health sectors, especially oral health, are playing to help curb SSB consumption. For immediate impact and to reverse the trend of the ongoing epidemic, robust policy, and advocacy efforts aimed at limiting SSB consumption are required at all levels – local, state, national, and global. To achieve this goal, health professionals representing different disciplines need to join forces to develop, implement, support, and sustain various policy and advocacy efforts.

Oral health professionals are uniquely positioned to influence healthy eating habits, including limiting SSB consumption among infants, children, and adolescents. Oral health professionals' frequent and ongoing contact with patients provides an opportunity to monitor weight and eating behaviors not only point-in-time, but, importantly, over time. In addition, there is considerable overlap in clinical guidelines and recommendations addressing both childhood obesity and dental caries, such as guidelines and recommendations related to reducing the intake of foods and beverages containing sugar, including SSBs, and increasing water consumption.

The recognition and advancement of oral health professionals' dual role is especially timely as the nation's health care system shifts from an episodic care driven to prevention focused model. As such, timing is perfect for the oral health community to embrace intersectoral collaborations and play a proactive role in preventing childhood obesity in all areas, including policy and advocacy.

The purpose of this review is to identify and synthesize existing evidence of efforts by oral health professionals and organizations to prevent childhood obesity and reduce children's consumption of SSBs through policy and advocacy. Little evidence exists on the role of the oral health community in influencing policy and advocacy to prevent childhood obesity and reduce children's consumption of SSBs. As such, a scoping review of scientific literature and a web-based review of oral health organizations were conducted to identify promising oral health initiatives that may be built on, leveraged, or replicated to influence childhood obesity and SSB consumption policy and advocacy efforts.

Methods

A scoping review of existing empirical evidence was conducted to identify and describe examples of efforts by oral health professionals and organizations to influence policy and advocacy to prevent childhood obesity and reduce children's consumption of SSBs. Unlike a systematic review that addresses precise questions, scoping review methodology allows for large-scale accumulation of literature to determine the status of existing research and identify gaps to inform future research. Scoping reviews are valuable for examining the status and scope of complex or nascent fields of study (6). In efforts to understand involvement of oral health professionals and organizations in recent childhood-obesity-related policy and advocacy efforts, the scoping review used a two-pronged approach: a) a review of the peer-reviewed literature and b) a web-based review of national and state oral health coalitions, associations, and community-based organizations to identify policy statements and guidelines and unpublished work. Selection criteria included research work published between 2000 and 2016, in English language and in the United States. Most importantly, our focus was limited to policy and advocacy efforts by oral health professionals to reduce childhood obesity and SSB consumption for children age up to 12 years.

Review of peer-reviewed literature

The review identified relevant peer-reviewed literature through searches using the following bibliometric databases: PubMed, EMBASE, and Google Scholar. Three broad descriptors were used to categorize search terms (provider, topic, and population) and the search terms were combined within each category using Boolean operators. The search terms categorized under each descriptor included: provider ("oral health professionals," "oral health care professionals," "dentist," "dentists," "dental hygienist," "community based program," "oral health coalition," "professional association," and "professional societies"), topic ("health policy," "policy," "advocacy," "influence," "role," "prevent," "reduce," "change," "obesity," "sugar-sweetened beverages," and "beverage consumption"), and population ("child," "children," "pre-teens," and "toddler").

Abstracts were reviewed for eligibility for selection. Duplicate studies were removed, and abstracts were examined further for full-text retrieval. Retrieved articles meeting selection criteria were reviewed, and data were extracted using a priori determined headings, which included study type, study design, methodology, author background, study population, objective, outcome, and key findings.

Review of oral health policy and advocacy initiatives

A comprehensive review of relevant websites of national and state oral health coalitions, associations, and organizations was conducted to identify policy initiatives, guidelines, and unpublished literature. Google was used as our search engine. "Oral health association," "Obesity," and "SSB consumption" were used as search terms through the search tab

Table 1 Summary of Evidence from Peer-reviewed Publications

Author, year published, and background	Literature type	Objective	Result
Vann, 2005, Pediatric Dentist	Descriptive study	Establish the link between nutrition and obesity to caries. Educating pediatric oral health community about obesity prevention.	Developed recommendations for pediatric dentists to elevate childhood obesity and reduce SSB consumption from practice-based, community-based, and advocacy-based perspective.
Nainar, 2013, Pediatric Dentist	Clinical/policy guidelines	Develop recommendations for a nutrition workup in pediatric oral health setting.	Suggested a 5-minute nutrition workup that pediatric dentists can use without over-emphasizing the child's weight.
Ziegler, 2016, Nutritionist and Pediatric Dentist	Clinical/policy guidelines	Establish the need to develop and incorporate weight screening and oral health education into child dental visit.	Oral health professionals are uniquely positioned to perform quick weight screenings and intervene early on for children with unhealthy weights.
Beaglehole, 2016, Dentist	Call to action	Establish an evidence base to invite the oral health community to assume a leadership role is reducing SSB consumption.	Dentist must act and learn from existing efforts by oral health community such as the Berkley Dental Society in reducing SSB consumption and preventing childhood obesity.

on these websites. Additionally, "policy" and/or "advocacy efforts," "oral health organizations," "reduce obesity," and "SSB consumption" were used in various combinations as search terms for identifying other national, state, and local oral health organizational websites. These websites were subsequently searched for relevant literature. Relevant literature was retrieved and reviewed for selection. Selected literature was analyzed and data extracted using a similar methodology as that used in the review of peer-reviewed literature.

Results

Results of peer-reviewed literature

The scoping review yielded 30 unique citations, of which four peer-reviewed publications met the inclusion criteria. Selected publications largely included work undertaken during 2004–2016. Publications selected to be eligible for inclusion were classified by their study type: descriptive study ($n = 1$), policy statements or clinical guidelines ($n = 2$), and call to action ($n = 1$), with wide variation in their design and methodology used. The descriptive study and the call to action were literature reviews. The policy statements and clinical guidelines utilized a survey and patient questionnaire for data collection. A summary is provided in Table 1.

Study type 1: Descriptive study

Through their 2005 descriptive study, Vann et al. discussed the links between oral health, nutrition, and childhood obesity in an effort to raise awareness in the pediatric oral health community about the childhood obesity epidemic. Vann et al. offered a framework for the role that pediatric dentists could serve as advocates for overall child health. In doing so, they described the importance of heightening oral health staff's awareness about addressing childhood obesity by drawing on the policy statement and recommendations issued by American Association of Pediatric Dentistry to help frame dietary and nutrition recommendations in the context of more oral-health-friendly concepts and terminology. Building on this guidance, they cited three ways in which pediatric dentists could be energized around nutritional messages and interventions: a) addressing early childhood caries, b) focusing attention on regular mealtimes and healthy snacking, and c) limiting soda consumption (7). Vann et al. also discussed the general reluctance that some pediatric dentists face in discussing sensitive issues related to children's weight with parents. As such, they recommended framing the diet and nutrition conversation within their own oral health mission: "it's not what children eat that causes dental caries, but rather how and when they eat it." They also recommended practical ways for sharing information on a child's weight, height, and body mass index, such as through an "oral health report card," which could also prompt a referral to a primary care health professional. Vann et al. closed their manuscript with five advocacy recommendations intended to position pediatric dentists as advocates to prevent childhood obesity: a) encourage parents, teachers, and others who influence children to discuss overall health habits; b) enlist policymakers to support healthy lifestyles within schools; c) ensure insurance coverage of effective obesity-prevention initiatives; d) encourage public and private funding sources to fund related

research; and e) promote social marketing to encourage healthy food choices and physical activity.

Study type 2: Clinical and policy guidelines

Two studies were identified that provided evidence-based clinical and policy guidelines for addressing childhood obesity and SSB consumption in oral health settings. Both studies affirmed the unique position of oral health professionals to provide basic weight screening and oral health education, while also pointing to ways to address resistance within the oral health community (8,9). In the study by Ziegler and Hughes, the authors reaffirmed Vann et al.'s notion of the general sensitivity of children and parents to participating in weight-status screening. As such, they provided a set of guidelines on approaching weight-status screening by being empathetic, nonjudgmental, and maintaining privacy during weight screening (9). They further suggested the importance of initializing the weight-screening discussion in a respectful way to allow the oral health professional to decide if the child or parent is willing to talk about the issue. In addition, the authors shared guidelines for screening, including terms for communication, measurement, and follow-up guidelines. Furthermore, they underscored the importance of identifying unhealthy weight status early and working collaboratively with other health professionals through referrals to registered dietitians or physicians to provide more in-depth evaluation and diet intervention (9). Finally, the authors discussed the important role of oral health professionals in delivering oral health education and resources on limiting consumption of SSBs (9).

The paper by Nainar provided a practical and concise evidence-based nutrition workup for oral health professionals to use in the dental office. Their workup recommendations addressed the issue of childhood obesity without overtly targeting a child's weight. The recommended workup included focusing on limiting SSB consumption and allowing dentists to address the issue of obesity without over-emphasizing the child's weight (8).

Study type 3: Call to action

In a published guest editorial, Beaglehole posed a call to action for oral health professionals to assume a leadership position in efforts to prevent childhood obesity and reduce children's consumption of SSBs. These editorial summarized recommendations for oral health education and roles oral health professionals and organizations could play in policy and advocacy, such as lobbying for the adoption of SSB-free hospitals, city councils, schools, and sports facilities. Beaglehole also recommended replication of strategies and interventions that follow tobacco and alcohol interventions, where legislation and regulations are vital to curbing their use (10).

Results of web-based review

A web-based review of oral health coalitions, associations, and organizations was conducted to identify existing oral health policy and advocacy initiatives to reduce children's consumption of SSBs. The review identified seven references that met the inclusion criteria. These references provided valuable insights on existing policy and practice guidelines and tools developed, advocated, or supported by these organizations to advance obesity-prevention efforts and reduce consumption of SSBs. However, little supporting literature was identified on the broader implementation or effectiveness of these policy and advocacy efforts. A summary of these resources is provided in Table 2.

National advocacy and policy initiatives

The review identified four national associations that issued or endorsed policy or practice guidelines associated with addressing childhood obesity and SSB consumption. These include: American Association of Pediatric Dentistry (AAPD), American Dental Association (ADA), American Dental Hygienists Association (ADHA), and the Association of State and Territorial Dental Directors (ASTDD).

AAPD, through its Policy Recommendation for Dietary Guidelines for Infants, Children, and Adolescents (2012), supported and encouraged the role of pediatric dentists and other health professionals in providing nutritional education focusing on healthy food choices and reducing consumption of high-carbohydrate beverages, including SSBs (11). Similarly, in 2015, ADA, through its technical comments on the draft 2015 Dietary Guidelines for Americans, supported the recommendations made by the advisory committee to focus on reducing sugar intake as a percentage of daily caloric intake, creating separate line for sugars on the nutrition facts label, and the need for additional research on the effect of sugar on health outcomes (12). ASTDD released a policy statement in 2015 that endorsed the inclusion of oral health in school nutrition curricula and promoted serving healthy foods on school campus (13). And ADHA in its revised Standards for Clinical Dental Hygiene Practice included consumption of SSBs in its risk-assessment guidelines (14).

State and local policy initiatives

Oral health organizations across some states have played a leading role in advocating for and advancing policies to prevent childhood obesity. The review identified three examples of proactive and developmental state and local initiatives by the oral health community. These included Cavities Get Around, a public will-building campaign in Colorado; guidelines developed by the Center for Oral Health in California for oral health integration in school nutrition curricula; and the Drink Pyramid, a tool developed by a dentist in Kentucky

Table 2 Summary of Evidence from Web-Based Review of Oral Health Policy and Advocacy Initiatives

Author, year published, and background	Literature type	Objective	Result
AAPD, 2012, Association	Policy guidelines	To recognize AAPD's role in promoting balanced, low caries-risk, nutrient-dense diets for infants, children, adolescents, and persons with special health care needs.	Support the position of Academy of Nutrition and Dietetics that all children should have access to healthy food and nutrition programs.
ADA, 2015, Association	Technical commentary	To provide technical comments on the scientific report of the 2015 Dietary Guidelines Advisory Committee.	Support limiting sugar intake as a proportion of daily caloric intake, including separate line for added sugars on nutrition and supplement label, and making potable water readily available.
ASTDD, 2015, Association	Policy statement	To acknowledge the need to integrate oral health education into school nutrition curricula.	Endorse the inclusion and expansion of oral health in school nutrition curricula, and promote healthy foods served on campus.
ADHA, 2016, Association	Standards for clinical dental hygiene practice	To develop and design strategies for preventing or limiting disease and promoting health.	Identify factors that should be evaluated to determine the level of risk; include nutrition history and dietary practices including consumption of SSBs.,
Center for Oral Health, 2011, Organization	Clinical and program guidelines	To develop a comprehensive approach to addressing oral health issues as they relate to physical health in school setting.	Develop and provide program guidelines to address oral health issues in school setting.
Drink Pyramid, 2013, Dentist	Tool and educational resource	To develop a tool to educate children and parents on healthy food choices and limiting SSB consumption.	The tool has been used in classrooms, clinics, and by community groups to improve oral and overall health, including for obesity prevention.
Delta Dental of Colorado Foundation, 2016, Oral Health Foundation/ Funder	Policy statement	To educate about the importance of good oral health and the means to achieve it.	In 2016, the foundation released a policy statement that discourages consumptions of SSBs and encourages intake of fluoridated water, fresh fruits, and vegetables.

to educate children and parents about healthy drink choices (15-17).

The Delta Dental Foundation of Colorado, through its Cavities Get Around campaign, worked to provide education and build awareness around limiting SSB consumption and increasing water intake. As part of this effort, the foundation released a policy statement which encouraged increasing intake of fluoridated water, expanding access to fresh fruits and vegetables, limiting SSB consumption to mealtimes, and discontinuing the use of sippy cups for SSB consumption (17). The Center for Oral Health issued guidelines for schools to integrate oral health education, including information about healthy eating habits and limiting SSB consumption, in their health programs and curricula (15). Finally, Dr. Stone, a dentist practicing in rural Appalachia, developed the Drink Pyramid, a graphical tool with supporting curricula to educate children and parents about healthy drink choices (16). The tool has been used across ten states and in three other countries (16); and it was written at a low literacy level and contained principles centered around four key points intended to reduce SSB consumption: Water Whenever (W/W); Milk with Meals (M/M); Juice Just once a day (J/J); and Pop only at Parties (P/P).

Discussion

The review identified the status of efforts by oral health professionals and organizations to influence policy and advocacy to prevent childhood obesity and reduce children's consumption of SSBs. While there is a growing need for oral health professionals to develop guidelines and policies to prevent childhood obesity and reduce children's consumption SSBs, the review found a paucity of national and state oral health efforts. Also the review identified few peer-reviewed studies that discuss the role of oral health professionals and organizations in influencing policy and advocacy. Nonetheless, this review makes an important contribution by providing a pulse of the current status of oral health professionals and organizations in addressing childhood obesity prevention through policy and advocacy. At the same time, the review informs

future directions, especially where more monitoring and public reporting of oral health professional and organizational activity is required for a better understanding of their role in childhood obesity prevention policy and advocacy.

There are promising steps that the oral health community can take to influence policy to address childhood obesity. The section that follows presents opportunities to leverage progress made to date to continue to build robust oral health policy and advocacy to prevent childhood obesity.

Issuing policy statements and guidelines by national oral health associations

In the last five years, national oral health associations have issued policy statements and guidelines focused on common risk factors for childhood obesity and dental caries. Many associations have also issued policy statements and guidelines on reducing SSB consumption through actions such as encouraging nutritional education during dental visits, requiring nutritional labeling of foods to identify added sugar, and encouraging nutrition-related curricula and healthy foods in schools. While these efforts represent necessary and promising steps toward the prevention of childhood obesity epidemic, they are only a small cross-section of the many ways that oral health associations may be positioned to collectively influence broader policies to limit SSB consumption – such as taxation of SSBs, banning SSB advertisement, and banning availability and sale of SSBs in child care settings and schools. Playing a proactive role in influencing a broad range of policies will be central for oral health organizations to tip the scale on the childhood obesity epidemic.

Building awareness and education of oral health professionals' role in childhood obesity prevention

Virtually all reviewed materials acknowledged the unique position that oral health professionals are in, not only to influence individual behaviors through education but also to influence national, state, and local policy and advocacy efforts. As part of this recognition, many of the published works emphasize the importance of providing education to build awareness among oral health professionals – including dentists, dental hygienists, and others within oral health clinics – of the common risk factors for obesity and dental caries. Providing a deeper understanding of the role that oral health professionals can play to influence children's overall health including influencing their diet, nutritional status, and weight, is central to greater advocacy roles in local, state, and national policy. As one study found, despite half of surveyed oral health professionals expressing interest in addressing obesity-related services and willingness to do so, many oral health professions admitted having a lack of knowledge regarding this topic (18). Building such knowledge will occur not only through training at clinics and in other settings but also through the integration of related curricula in dental schools. As a recent review suggested, "dental training largely ignores the role of policy in shaping oral health and does not develop future dentists' advocacy skills" (19). In presenting findings from an AAPD study, these authors also found that while 90 percent of respondents supported an advocacy role for dentists, less than half said they took any kind of action, and only 22 percent said they were trained in advocacy.

Integrating childhood obesity prevention into local oral health initiatives

While several national oral health associations have oriented their policy and advocacy efforts to prevent childhood obesity and reduce children's consumption of SSBs, there are few efforts at state and local levels, such as those featured in this review from California, Colorado, and Kentucky. These three efforts were generally intended to target "individuals," as opposed to "systems" at statewide or citywide levels. This is an important finding, as local, regional, and state oral health coalitions primarily serve as the oral health advocacy groups for their respective community, region, or state. With little identified activity on their part to influence broad SSB policies, there may be a missed opportunity for such local coalitions and initiatives to have a more meaningful impact on preventing childhood obesity and improving children's overall health.

Positioning oral health professionals to prevent childhood obesity and reduce SSB consumption through policy and advocacy efforts

While oral health professionals and organizations have influenced some clinical and school-based policies to address childhood obesity and SSB consumption, findings suggest there are many more opportunities to build on these efforts to inform policy at all levels. This section presents ways that oral health professionals and organizations can play a greater role in influencing policy and advocacy efforts related to childhood obesity and SSB consumption nationally and within states, such as: elevating oral health voices publicly and in media, playing a greater role in advocating for common oral health and obesity-prevention policies, and integrating a role for oral health professionals in broader health care transformation.

Elevating oral health voices in obesity prevention publicly and through media

Positioning the oral health community to play a more influential role in implementing oral health interventions to prevent childhood obesity and reduce SSB consumption will require a greater presence and voice in the media to reiterate

this common objective. One recent study found that oral health was nearly absent from public and media discussions of Berkeley and San Francisco's soda tax debates to limit SSB consumption – an opportunity largely missed for oral health professionals to come together with other health professionals and public health advocates to advance an objective central to promoting oral health (19). Somji et al. reiterated through their review: "[b]y identifying specific policy goals, inserting oral health perspectives into news and opinion coverage and becoming visible spokespeople, oral health professionals can position themselves to provide new and powerful health arguments to both policymakers and the public" (19).

Playing a bigger role to advocate for common oral-health-promotion and obesity-prevention policies

Oral health professionals and organizations have an opportunity to come together with other health professionals and public health advocates on policy propositions common to addressing obesity and oral health, such as propositions related to SSB consumption. One opportunity may be to advocate for taxation of SSBs, which has shown to reduce SSB consumption. Beyond taxation, the oral health community can play a greater role in advocating for SSB advertisement bans and limiting SSB availability in schools and other public places, especially oral health settings and other health care settings. This includes utilizing and leveraging resources developed by other organizations, such as the 5210 Let's Go campaign, a nationally recognized obesity-prevention effort. The toolkit used in the campaign is supported by the American Academy of Pediatrics and has been successfully implemented in several states and communities (20). The campaign encouraged zero consumption of SSBs and increased intake of fresh fruits and vegetables.

Integrating a role for oral health professionals in health care transformation

The U.S. health care system is undergoing significant transformation, shifting from a system oriented around "sick care" to increasingly promoting integrated services that address prevention, wellness, and the upstream factors that shape health and opportunity to lead healthy lives. This "whole person," prevention, and early intervention approach provides an opportunity for oral health professionals to advance common policies and practices. For example, oral health professionals can advocate for trained and reimbursable community health workers in team-based care models to provide diet, nutrition, and SSB-related education as a regular service in oral health and other health settings. This and other broad health-delivery transformations may offer the oral health community a platform to collaboratively and simultaneously advance common pediatric oral health and other health objectives.

While findings from this review offer insights on progress by the oral health community related to childhood obesity prevention, there are some limitations to identifying the full range of efforts that exist. First, the present scoping review search terms may not have captured the full spectrum of articles that exist on the topic. Second, the review is a point-in-time snapshot of oral health professional and organizational activities, it is likely that initiatives in nascent stages, in progress, or unpublished as yet were not captured here. Nonetheless, this review represents an important first step toward building an evidence base for identifying the status of efforts by the oral health community and their effectiveness in informing policy and advocacy to prevent childhood obesity and reduce children's consumption of SSBs. It also informs a framework to more fully engage oral health professionals and organizations in playing an active role to influence policy and advocacy to reduce childhood obesity.

Conclusion

This review affirms the growing recognition among oral health professionals and organizations of their role in preventing childhood obesity and reducing consumption of SSBs. It offers insights into how oral health professionals have positioned themselves to influence policy and advocacy to address childhood obesity, while also pointing to the need for more robust monitoring and public reporting of such efforts. To conclude, the response to SSB consumption may need to follow the active role that oral health professionals and organizations have played in addressing other public health issues, such as tobacco use, where legislation and regulation have been central to reducing use.

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