Strategies to Prevent Obesity and Other Chronic Diseases

The CDC Guide to Strategies to Decrease the Consumption of Sugar-sweetened Beverages

National Center for Chronic Disease Prevention and Health Promotion
Division of Nutrition, Physical Activity and Obesity

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The CDC Guide to Strategies to Decrease the Consumption of Sugar-sweetened Beverages

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention
National Center for Chronic Disease Prevention and Health Promotion
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Using This Guide

This document provides guidance for program managers, policy makers, and others on how to select strategies to reduce sugar-sweetened beverage consumption. It offers the most relevant information on each type of strategy. The discussion of each strategy follows the outline defined here.

Strategy

Describes an environmental change or policy-related activity intended to prevent disease or promote health in a group of people, also referred to in the literature as an *approach*. Criteria for inclusion of a strategy in this document are a rationale supporting the strategy and evidence that the strategy has been effective.

Definition

Briefly describes the strategy.

Rationale

Explains why the particular strategy is important to efforts to reduce consumption of sugar-sweetened beverages.

Evidence of Effectiveness

Draws on peer-reviewed literature and current practice to summarize the evidence of the strategy's effectiveness.

Key Considerations

Includes information that may be important to keep in mind during the planning, implementation, or evaluation phases of a strategy.

Action Steps

Identifies specific activities for each strategy that public health professionals can take to implement strategies in specific settings, including communities, schools, child care facilities, work sites, and medical care facilities.

Program Examples

Includes examples of programs that use the strategy as a way to decrease consumption of sugar-sweetened beverages. Program examples were selected from interventions described in other publications, such as peer-reviewed journals or program reports, or identified by key informants and through Internet searches.

Resources

Guides the reader to further materials and information that might be useful in planning, implementing, or evaluating the strategy.

Introduction to Sugar-sweetened Beverage Consumption

Sugar-sweetened beverages are the largest source of added sugar[1] and an important contributor of calories in the U.S. diet.[2] Sugar-sweetened beverages also tend to have few, if any, other nutrients. Although the definitions used by researchers have varied,[3–5] we define sugar-sweetened beverages as any beverage to which caloric sweeteners—typically high fructose corn syrup or sucrose (table sugar)—have been added.

Although the body's response to added sugar in milk may differ from that of other sugar-sweetened beverages because of the presence of protein and other nutrients, adding sugar to milk substantially increases the calories per serving without increasing the overall nutrient value of the drink.

In 1965, per capita consumption of sugar-sweetened beverages (excluding sweetened milks) was 50 kcal/day (2.5% of total calories) among adults in the United States.[6] Currently, consumption is estimated at 224 kcal/day (11% of total calories) among youth (aged 2–19 years)[5] and 203 kcal/day (9% of total calories) among adults (aged 20 years or older).[3] On a typical day, 80% of youth[5] and 63% of adults consume sugar-sweetened beverages.[3]

The highest consumers of sugar-sweetened beverages are adolescents aged 12–19 years (13% total calories), particularly males, non-Hispanic blacks, Mexican Americans, people with low incomes, and people who are obese (14%–16% total calories).[5]

Several social and environmental factors have been linked to the purchase and consumption of sugar-sweetened beverages. These factors include advertising and promotion,[7] increased portion sizes,[8] fast-food consumption,[9] television watching,[10] permissive parenting practices,[11] parental sugar-sweetened beverage consumption,[12] and increased access to sugar-sweetened beverages in the home and school.[5,13,14]

Several mechanisms have been proposed to explain the association between sugar-sweetened beverage consumption and obesity. First, people may fail to compensate for the added calories consumed as liquid, which can result in excess intakes of sugar and calories.[15] Second, the rapid drop in blood sugar that follows the insulin response to consumption of foods high in sugar increases hunger and may thereby increase food consumption.[16] Third, fructose (a sugar found in

Sugar-sweetened Beverage Examples

- Soft drinks: Nonalcoholic, flavored, carbonated or noncarbonated beverages usually commercially prepared and sold in bottles or cans.
- Soda, pop, soda pop: Same as soft drinks.
- Fruit drinks, punches, or ades: Sweetened beverages of diluted fruit juice.
- Sports drinks: Beverages designed to help athletes rehydrate, as well as replenish electrolytes, sugar, and other nutrients.
- Tea and coffee drinks: Teas and coffees to which caloric sweeteners have been added.
- Energy drinks: Most energy drinks are carbonated drinks that contain large amounts of caffeine, sugar, and other ingredients (such as vitamins, amino acids, and herbal stimulants).
- Sweetened milks or milk alternatives: Beverages prepared by blending sweetened powder or syrup and milk.

commonly used sweeteners) does not stimulate hormones that help regulate satiety.[17] Fourth, the inborn human desire for the sweet taste can override normal satiety signals.[14]

High consumption of sugar-sweetened beverages has been associated with obesity. Many longitudinal studies, but not all, have shown an association between sugar-sweetened beverages and various measures of increased body fat.[18–26] Systematic reviews indicate that a greater consumption of sugar-sweetened beverages is associated with small but significant weight gain and obesity.[15,27]

In addition, the results of the recent PREMIER trial demonstrated that reduction of sugar-sweetened beverage consumption among adults was significantly associated with weight loss. A decrease of 1 serving/day (12 ounces) was associated with a minor weight loss of 0.49 kg at 6 months and 0.65 kg at 18 months among adults.[28]

Several other health conditions have been associated with the consumption of sugar-sweetened beverages. These conditions include diabetes,[29,30] elevated triglycerides,[31,32] cardiovascular disease,[33] nonalcoholic fatty liver disease,[34] elevated uric acid levels,[35] gout,[36] and dental caries.[37] Furthermore, sugar-sweetened beverage consumption has been linked to nutritionally inadequate diets, possibly because of the displacement of nutrient-rich foods such as milk, with sugar-sweetened beverages.[38–41]

Research indicates that consumption of sugar-sweetened beverages is a modifiable behavior and that reducing consumption can result in a decrease in weight,[28] a measure commonly used to assess excess body fat.

Strategies to reduce sugar-sweetened beverage consumption have been identified for specific settings for obesity prevention. These settings include communities (including homes), schools, child care facilities, work sites, and medical care facilities. The selection of these intervention strategies is based on a rationale supporting the strategy.

Strategies were selected on the best available evidence, as well as the knowledge and expertise of the authors and Centers for Disease Control and Prevention (CDC) partners.

Strategy 1. Ensure ready access to potable drinking water

Definition

To promote water consumption, potable drinking water should be easily accessible to children and adults in homes and public facilities, including parks, playgrounds, schools, public buildings, work sites, and clinics.

Rationale

Water is essential for life. Although our daily fluid intake requirements can be obtained from a variety of beverages and foods, potable drinking water is a calorie-free, thirst-quenching option.[42] In addition, fluoridated drinking water has another key function: it helps to prevent dental caries, the most prevalent chronic disease among children in the United States.[43]

In 2008, 8% of the U.S. population served by community water systems received drinking water that did not meet all applicable health-based drinking water standards.[44] Furthermore, in communities with potable drinking water, ready access outside of the home in schools, parks, and public and commercial buildings is often limited because water fountains or coolers are not functioning.

People without ready access to potable drinking water may consume more sugar-sweetened beverages. For example, many rural areas in Alaska (northern and southwestern regions) lack ready access to potable drinking water. In these areas, more than half (58%) of 2-year-olds drank two or more cups of sugar-sweetened beverages (>13 teaspoons of added sugar) per day compared with 21%–26% of 2-year olds in all other regions of the state in 2006.[45] Adults in rural Alaska drink about three times as much soda per day as their urban counterparts.[46]

Over the past decade, bottled water sales have increased dramatically in the United States.[47] This increase has been influenced by the marketing and availability of a vast selection of new bottled water products and by consumer demand. The Institute of Medicine's (IOM) Committee on Nutrition Standards for Foods in Schools examined evidence on increased consumption of bottled water products and their effects.[48]

The IOM recommended that carbonated, fortified, and flavored water should be excluded during the school day. This exclusion was based on evidence that these beverages are unnecessary for hydration and are associated with displacement of beverages that are more healthful than sugar-sweetened beverages. In addition, the increasing number of products makes it difficult to identify the more healthful products among them.[48]

Evidence of Effectiveness

A school-based environmental and educational intervention was conducted to promote water consumption among elementary school students in Germany. The intervention focused on the water needs of the body and the water circuit in nature. For the environmental intervention, water fountains were installed in schools, and plastic water bottles were given to each child.[49]

Outcome measures were evaluated at baseline and 1 year after intervention. The results indicated that the risk for overweight decreased 31% in the intervention group compared with the control group. Furthermore, water consumption was 1.1 glasses/day (about 7.4 ounces) higher in the intervention group.[49]

A randomized, controlled trial was conducted to determine whether a multicomponent intervention aimed at discouraging sugar-sweetened beverage consumption could prevent excessive weight gain among students at 22 elementary schools in Brazil. Fourth graders in the intervention schools were given classroom-based education that encouraged consumption of water instead of sugar-sweetened beverages throughout the school year. All students in the intervention classes were taught the benefits and importance of drinking water. In addition, a campaign that promoted water consumption was conducted, and water bottles with the campaign logo were distributed to the children and their teachers.[50]

After 7 months, children in the intervention schools drank a significantly smaller amount of carbonated beverages, about 2 ounces over the previous 24-hour recall, than those in the control schools. In addition, among overweight students at baseline, the intervention group had greater body mass index (BMI) reduction than the control group, but this difference was statistically significant among girls only. Water intake was not measured.[50]

The Zuni Pueblo High School Diabetes Prevention Program was a multicomponent intervention conducted among American Indian high school students in the United States. Health education was provided to decrease sugar-sweetened beverage consumption and to increase knowledge of diabetes risk factors. This education was combined with environmental changes designed to increase access to potable drinking water and physical activity. Outcome measures were evaluated at 0, 1.5, and 3 years.[51]

The results indicated that reducing access to sugar-sweetened beverages could eliminate in-school sugar-sweetened beverage consumption among high school students. By the intervention's third year, the 400 students at Zuni High School consumed almost no sugared soft drinks at school, a decrease from 800 12-ounce cans per week for 400 students (24 ounces/week/student). Soft drink consumption had been replaced by consumption of 150 gallons of water per week from the water coolers (24 ounces/week/student) and 260 12-ounce cans of diet soda (7.8 ounces/week/student). However, there were no significant differences in BMI over 3 years.[51]

Action Steps

1. Complete a needs assessment to identify where access to potable drinking water is limited.
2. Collaborate with oral health partners and others with a common interest to develop a work plan to promote the consumption of (fluoridated) drinking water.
3. Advocate with public and private partners to improve the infrastructure to increase access to potable drinking water.
4. Collaborate with state, local, and city government officials to establish, promote, and enforce policies to ensure ready access to potable drinking water.
5. Promote legislation in your state to establish and promote policies to ensure that children attending schools and child care facilities have ready access to potable drinking water throughout the day, including at meals.

Key Considerations

- Increased bottled water sales have raised concerns regarding the lack of regulation, the lack of fluoridation, and the effect on the environment related to bottling and disposal practices.
- Because the taste and odor of drinking water is not included in federal and state requirements, challenges (e.g., costs) in providing palatable drinking water should be addressed.[52]

Program Examples

Zuni Pueblo High School Diabetes Prevention Program

A school-based multicomponent intervention was conducted to reduce sugar-sweetened beverage consumption as part of the Zuni Pueblo High School Diabetes Prevention Program. This intervention for American Indians included health education designed to decrease sugar-sweetened beverage consumption and increase knowledge about diabetes risk.[51]

An environmental change component included providing quality water for students in coolers in several school locations. Additionally, school officials gradually replaced sugar-sweetened soft drinks in the vending machines with diet soft drinks. Sugar-sweetened soft drinks in the schools were completely replaced by water and diet soft drinks.[51]

Fresh Kids Primary School Intervention

The aim of the Fresh Kids program was to evaluate the effectiveness of the Health Promoting Schools (HPS) framework. This framework was used to create a supportive school environment to increase water and fruit consumption and prevent obesity among students in 35 primary schools in Australia.[53]

The HPS objectives included

- Establishing sustainable program partnerships between schools and local health and community agencies.
- Creating supportive school environments that promote water and fruit consumption during the school day.
- Enhancing student learning by linking the school curriculum with broader strategies to promote water and fruit consumption. Lunchbox audits were conducted to evaluate change in student dietary patterns.[53]

By the end of the first year, the increase in the proportion of children with filled water bottles was 15%–50% across the schools. The proportion of sugar-sweetened beverages in lunchboxes decreased in all schools by 11% to 38%.[53]

New York City's Nutritional Standards for Child Care

New York City Code requires that potable drinking water be made easily accessible to children attending child care throughout the day, including at meals. City code also prohibits providing beverages with added sweeteners, whether artificial or natural, to children enrolled in child care.[54]

Resources

Wise up on Water!
Water UK
Highlights the importance of adequate water intake for children.
http://www.water.org.uk/home/water-for-health/resources/wise-up---children-web.pdf

Bottled Water: Learning the Facts and Taking Action
Sierra Club
Advocates for a reduction of bottled water use and an increased use of tap water.
http://www.sierraclub.org/committees/cac/water/bottled_water/bottled_water.pdf

Healthy Water: Drinking Water
Information on many uses for water, our most precious global resource.
http://www.cdc.gov/healthywater/drinking/index.html

Fact Sheet on Questions About Bottled Water and Fluoride
Centers for Disease Control and Prevention, Division of Oral Health
Common questions about bottled water and fluoride are answered.
http://www.cdc.gov/fluoridation/fact_sheets/bottled_water.htm

Water Quality Funding Sources for Schools: A Resource for K–12 Schools and Child Care Facilities
U.S. Environmental Protection Agency
More than 60 national and state funding sources that schools can use to address water quality and other environmental health issues.
http://www.epa.gov/safewater/schools/pdfs/lead/funding_schools_fundingsources.pdf

Strategy 2. Limit access to sugar-sweetened beverages

Definition

Sugar-sweetened beverages are readily accessible in homes, schools, work sites, and communities. Limiting availability and accessibility can decrease the consumption of sugar-sweetened beverages and increase the consumption of more healthful beverages.

Rationale

Currently, sugar-sweetened beverages are readily accessible to children and adults throughout the day in their homes, schools, and work sites. Even very young children are being given sugar-sweetened beverages by their parents and caregivers in home and child care settings. Almost 30% of 12- to 14-month-old children, 37% of 15- to 18-month-old children, and 44% of 19- to 24-month-old children consume fruit drinks or carbonated soft drinks at least once in a day.[55]

On weekdays, children get 55%–70% of the sugar-sweetened beverage calories they consume at home; only 7%–15% of these calories are consumed in schools.[5] Among young adults (aged 20–44 years), about 50% of sugar-sweetened beverages are consumed at home, and 20% are consumed at work.[3]

Several factors in the community and home environment influence beverage consumption patterns including accessibility of sugar-sweetened beverages and parenting practices, although the effect of these influences may vary by sex. For example, although adolescent boys with greater access to less healthful beverages at home are more likely to consume sugar-sweetened beverages, this access appears to be a poor predictor of soft drink consumption in girls.[11]

Parenting behavior is also important; adolescent soda consumption has been associated with parental soda consumption.[56] The availability of fast-food restaurants in communities also may play a role, as frequent visits to fast-food restaurants was associated with higher sugar-sweetened beverage consumption.[9]

School-aged children have access to sugar-sweetened beverages at school throughout the day from vending machines and school canteens and at fundraising events, school parties, and sporting events.[57] In the United States, 21% of elementary schools, 62% of middle schools, and 86% of high schools have a vending machine, school store, canteen, or snack bar where students can buy foods or beverages, often during their lunch periods.[57] Although national school meal programs require that meals meet national nutrition standards, competitive foods (those sold outside the U.S. Department of Agriculture [USDA] school meals programs) do not have to meet these standards.

Many schools have "pouring contracts" with beverage suppliers, and profits from these contracts provide income to the school in proportion to beverage sales. Thus, encouragement to consume sugar-sweetened beverages through school-based advertising and opportunities such as increased access to scholarship funds (from beverage suppliers) are greater in schools that have beverage contracts.[58,59]

Although concerns have been raised regarding the potential loss of income that would result from revising or eliminating pouring contracts, evidence suggests that these concerns may be unfounded. A review of school beverage contracts in Oregon Public School Districts in 2004 showed that vendor cash advances and noncash payments to the school are minimal, ranging from $2 to $8 per student per year. This amount is in contrast to an expected vendor profit of $12–$24 per student per year.[58]

Many state agencies and school districts impose restrictions on the sale of beverages and foods in schools. Twenty-three states (46%) and many school districts have policies for competitive foods that are more stringent than USDA regulations on the National School Lunch Program.[60] Another study reported that 19 (39%) of the 51 largest school districts in each state and the District of Columbia had competitive food policies beyond state or federal requirements during 2004–2005. Of those 19 school districts, 63% had policies that restrict soda in all schools, and 74% had policies that restrict sugar content of juice drinks.[61]

Coinciding with this study, a recent report was released to assess availability of less healthful beverages and snack foods in middle and high schools as a part of the 2008 School Health Profiles Survey. The percentage of schools that restrict soda pop or sports drink sales to students varied widely. Among the 34 states included in this study, the 2008 data showed that the percentage of schools in which students could not buy soda pop or sports drinks in schools ranged from 26% to 93% for soda pop and from 23% to 85% for sports drinks. Furthermore, the state median percentage of schools that restrict soda pop or sports drink sales to students was 63% for soda pop and 44% for sports drinks.[62]

A large proportion of children in the United States are enrolled in some form of child care. According to the 2005 National Household Education Survey, 51% of U.S. children aged 0–2 years and 74% of children aged 3–6 years who were not in kindergarten were in some form of nonparental care. About 20% of children aged 0–2 years and 57% of children aged 3–6 years who were not in kindergarten were in center-based child care.[63]

However, a review of U.S. state regulations for child care facilities for all 50 states and the District of Columbia reported that only seven states (14%) have regulations that restrict sugar-sweetened beverages in both child care centers and family child care homes. Furthermore, only four states (8%) have regulations that prohibit vending machines at child care centers; two of these states also restrict vending machines at family child care homes.[64]

Vending machines were available in 79% (15 out of 19) of health care facilities (8 hospitals, 7 clinics, and 4 public health departments) in six California communities that are participating in an environmentally focused childhood obesity prevention program. The majority of beverages sold in vending machines were less healthy items. The most common beverage was soda: 30% in hospital vending machines and 38% in clinic vending machines. Water (20%) made up the highest percentage of all beverages offered for sale in health department vending machines. Across 19 health care facilities, 75% of beverages offered for sale in vending machines did not meet California's school nutrition standards.[65]

Evidence of Effectiveness

Students who participate in the National School Lunch Program, which restricts the sale of carbonated soft drinks in the same location where lunch is being served, consume significantly less added sugar than nonparticipants. Among participants, mean intake of added sugars contributed 17% of their daily caloric intakes, compared with 20% for nonparticipants.[66] The Alliance for a Healthier Generation, a collaboration between the Clinton Foundation and the American Heart Association, developed the School Beverage Guidelines[67] to encourage students to consume lower-calorie and nutritious beverages outside school meals during the regular and extended school day.

In voluntary agreement with the alliance, the American Beverage Association and several beverage producers have adopted these guidelines as their school beverage policy. They also agreed to encourage their bottlers to adhere to the School Beverage Guidelines, and they agreed to support an annual analysis to assess the implementation and effect of these guidelines.

According to an independent evaluation of the program in 2008, nearly 80% of all school beverage contracts were in compliance with these guidelines, contributing to an almost 60% drop in beverage calories shipped to schools since 2004.[68] Furthermore, a reduction in the purchase of regular carbonated soft drinks was observed among high school students after the implementation of these guidelines.

The average student bought 12.5 ounces of regular carbonated soft drinks per week in schools (about one can of soda per school week) in 2004, but by the 2007-2008 school year, soft drink purchases decreased by one-third to two-thirds of a can per student per week.[68]

Action Steps

1. Use price adjustments to decrease the cost of more healthful beverage alternatives in relation to sugar-sweetened beverages. (See Action Steps for Strategy 5.)
2. Establish a policy that requires provision of a greater proportion of healthier beverages relative to sugar-sweetened beverages.
3. Convene a meeting with school officials to jointly address the availability and sale of sugar-sweetened beverages in schools and suggest that they involve students in these discussions.
4. Collaborate with state and school district officials to include in school wellness and nutrition policies a component that eliminates the sale of sugar-sweetened beverages on school grounds, including during sports venues, and as part of school-based activities such as fundraising. These policies should be consistent with recommendations from IOM's *Nutrition Standards for Foods in Schools: Leading the Way Toward Healthier Youth*.[48]
5. Collaborate with state and school district officials to redefine or eliminate beverage pouring contracts in schools. As needed, build support for pouring contract changes by addressing the concerns of school administrators, parents, and others regarding potential loss of revenue.

Key Considerations

- Once sugar-sweetened beverage policies are adopted, including those voluntarily adopted by the beverage industry, ensure that enforcement mechanisms are in place for these policies.
- Although schools provide an important opportunity to educate students about sugar-sweetened beverages, limit their availability, and model healthy behavior, reducing consumption only at school may have little effect on overall sugar-sweetened beverage consumption because the majority of these beverages are consumed at home.[5]
- Schools may be resistant to changing their beverage policies until concerns about potential loss of revenue from the sale of sugar-sweetened beverages are addressed. A growing body of evidence indicates that schools can have strong nutrition standards that restrict availability of sugar-sweetened beverages and maintain financial stability.

Program Examples

New York City

New York City is the first major U.S. city to set nutrition standards for all foods bought and served by the city. These standards apply to all meals or food supplies bought, prepared, or served in all programs administered by city agencies or in other relevant settings. The standards also are part of the city's effort to reduce obesity in schoolchildren, who are the most frequent consumers of city food, and to reduce obesity and high blood pressure in adults and older adults who regularly eat publicly purchased food.[69]

The new standards apply to snacks and meals served in places such as schools, senior centers, homeless shelters, child care centers, after-school programs, correctional facilities, public hospitals, and parks. The standards require city agencies to serve only healthful beverages such as skim or 1% milk (children aged 12 months to less than 2 years are allowed to drink whole milk). These standards require that 8-ounce beverages other than 100% juice or milk have 25 calories or fewer.[69]

Juice must be 100% fruit juice, and serving size is recommended not to exceed 6 ounces per serving for children in elementary school. For children aged 2–18 years, flavored milk and flavored fluid milk substitutes are permitted, but they must have 130 calories or fewer per serving. These standards include a recommendation that city agencies continue to phase out flavored milk and flavored fluid milk substitutes over time.[69]

National School Lunch and School Breakfast Programs

The National School Lunch Program and the School Breakfast Program are federally supported programs that provide nutritionally balanced meals at low cost or no cost to students in nearly all public and many private schools throughout the United States. USDA regulations prohibit the sale of Foods of Minimal Nutritional Value, including carbonated soft drinks, at the same time and in the same location that national food program meals are being served. Evidence suggests that participants in the National School Lunch Program are 4 times as likely as nonparticipants to consume milk at lunch and to have adequate daily intakes of key nutrients.[70]

West Virginia Department of Education Standards for School Nutrition

Legislative rules were passed by the West Virginia State Department of Education in 2008 to establish comprehensive nutrition standards for beverages and foods sold, served, or distributed during the school day. The rules specify that beverages available to students at all grade levels must contribute to students' nutrient requirements and should not add unnecessary calories, fat, or sodium. Specifically, allowable beverages are water, 100% fruit or vegetable juice, and nonfat or 1% low-fat milk (flavored or unflavored).[71]

All beverages must contain fewer than 200 calories and fewer than 35% of calories from sugar. Portion sizes of juice should be limited to 4 ounces for elementary students and no more than 8 ounces for middle and high schools students. Drinking water must be offered with meals.[71]

Furthermore, plain, unflavored drinking water must be available to students throughout the school day at no charge. Unacceptable beverages by these rules are soft drinks, coffee and coffee-based products, and other caffeinated products. In addition, the state policy also prohibits the use of beverages as a means of reward, restricts the use of beverages in fundraising, and sets limits on school advertising of beverages.[71]

The new policy is being phased in throughout West Virginia. Internal reports prepared by the West Virginia State Department of Education indicate that the number of schools in compliance with these rules increased from 25 schools during the 2007-2008 school year to 46 schools in 2009. The effect of this new policy on school revenues has been minimal.[72]

Philadelphia School District Beverage Policy

A new beverage policy for the School District of Philadelphia, the fifth largest school district in the country, was developed to promote healthy eating and decrease childhood obesity and diet-related diseases. The new beverage policy eliminated sodas and implemented a policy for all vending and à la carte sales as of July 2004. Allowable beverages are 100% juice, water with no additives except those normally added to tap water, and low-fat or nonfat milk (plain or flavored).[73]

Resources

Nutrition Standards for Foods in Schools: Leading the Way Toward Healthier Youth
Institute of Medicine (IOM)
Nutrition standards for K–12 schools focusing on competitive foods.
http://www.iom.edu/CMS/3788/30181/42502.aspx

Nutrition Standards for Foods in Schools Fact Sheets
Centers for Disease Control and Prevention, Division of Adolescent and School Health
Use to support strong nutrition standards consistent with the IOM's recommendations.
http://www.cdc.gov/Healthyyouth/nutrition/standards.htm

Making it Happen! School Nutrition Success Stories
U.S. Department of Agriculture and Centers for Disease Control and Prevention
Collection of approaches implemented by more than 30 schools and school districts to improve the nutrition environment in schools.
http://www.fns.usda.gov/tn/Resources/makingithappen.html

American Beverage Association
Represents hundreds of beverage producers, distributors, franchise companies, and support industries.
http://www.ameribev.org/

Wellness Policy Tool
Action for Healthy Kids
Step-by-step guide to developing a local wellness policy within a school district.
http://www.actionforhealthykids.org/wellnesstool/index.php

Healthy Beverage Tool Kit
The Food Trust
Promote healthy beverage consumption in schools with information for school staff, administration, parents, and community.
http://www.thefoodtrust.org/php/programs/school.food.beverage.reform.php

Alliance School Beverage Guidelines Implementation Toolkit
Alliance for a Healthier Generation
Guidelines for schools revising their beverage policies to promote the consumption of more healthful beverage options among students.
http://www.healthiergeneration.org/uploadedFiles/For_Schools/Helpful_Tools/Alliance%20School%20Beverage%20Toolkit.pdf

Best Practices for Healthy Eating: A Guide to Help Children Grow Up Healthy
Nemours Health and Prevention Services
Nutrition guide for parents and health professionals on recommended eating habits throughout the life stages of infancy through adolescence. http://www.nemours.org/content/dam/nemours/www/filebox/service/preventive/nhps/heguide.pdf

Strategy 3. Promote access to and consumption of more healthful alternatives to sugar-sweetened beverages

Definition

Beverages such as water, low-fat/nonfat milk, and 100% juice contribute to meeting daily nutrient needs. Although sugar-sweetened beverages contain water, they tend to be high in calories and have few other nutrients, which can negatively affect dietary quality and contribute to excess energy intake.[3,20] Strategy 3 aims to increase efforts by policy makers, community leaders, and parents to provide access to and encourage consumption of more healthful beverages in place of sugar-sweetened beverages.

These efforts include developing or adopting healthy beverage policies for various settings. Alternative beverages can provide fewer calories, as well as valuable nutrients such as calcium, iron, folate, vitamin A, and vitamin C.[74,75] Although there is no standard definition of a healthy beverage, the IOM's school nutrition beverage guidelines have established recommendations for school-aged children.[48]

Rationale

Providing access to more healthful alternatives to sugar-sweetened beverages may help reduce sugar-sweetened beverage consumption because people without ready access to potable drinking water tend to drink more sugar-sweetened beverages.[45] One study has shown that when availability of healthier beverages (e.g., milk) increases, consumption of healthier beverages increases and sugar-sweetened beverage consumption decreases.[76]

Marketing of foods and beverages influences children's preferences, purchase requests, and consumption.[77] In addition, the beverage consumption patterns of parents appear to be an important influence on their children's consumption of soft drinks.[12] Children whose parents regularly drink soft drinks are nearly three times more likely to consume soft drinks five or more times per week.[14] When parents avoid consuming soft drinks in the presence of children, children consume fewer soft drinks.[12]

Evidence of Effectiveness

Several individual/parent and school-based lifestyle interventions designed to improve dietary quality or access to more healthful alternatives have demonstrated a decrease in sugar-sweetened beverage consumption. For example, the Hunter Illawarra Kids Challenge Using Parent Support study was a multicomponent intervention designed to help parents and children change their diet and lifestyle. The study showed that the intervention helped to improve the diets of the children of participating parents by significantly decreasing their total energy intake and sugar-sweetened beverage consumption.

Overweight or obese children (aged 5–9 years) and parents were randomly assigned to one of the following three groups: (1) a parent-centered family lifestyle and dietary modification program, (2) a child-centered physical activity skill development program, or (3) a combination of both programs. After 12 months, sugar-sweetened beverage consumption decreased among children participating in all of the programs. The mean sugar-sweetened beverage intake for all children significantly decreased from 5.0% of total energy intake to 2.9%.[78]

The Memphis Girls Health Enrichment Multi-site Study was a multicomponent, family-based and culturally appropriate lifestyle intervention

Institute of Medicine's *Nutrition Standards for Foods in Schools*

The Institute of Medicine Committee on Nutrition Standards for Foods in Schools developed recommendations for beverages sold outside the national school meal programs.[48]

Tier 1 beverages are those that provide important health benefits and do not exceed levels of nutrients and compounds that may be unhealthful for school-aged children when consumed in excess. Tier 1 beverages include

- Plain, potable water.
- Low-fat/nonfat milk (or soy/lactose-free alternatives) in 8-ounce portions and, if flavored, with fewer than 22 g of total sugars per 8-ounce portion.
- 100% fruit juice in 4-ounce portions for elementary and middle schools and 8 ounces for high schools.

Tier 2 beverages provide additional options that help to limit caloric intake and are for high school students and after school only. Tier 2 beverages include noncaffeinated, nonfortified drinks that contain fewer than 5 calories per portion.

Sports drinks should be available at the discretion of coaches for students doing vigorous physical activity lasting 1 hour or longer.

that effectively decreased sugar-sweetened beverage consumption among African American adolescent girls. The girls were randomly assigned to one of the following three groups: (1) an intervention that provided weekly group sessions with the girls, (2) an intervention that included weekly group sessions with the girls' parents or caregivers, or (3) a comparison group.

Content focused on knowledge and behavior change skills to promote healthy eating, including decreasing sugar-sweetened beverage consumption and increasing physical activity. The comparison group focused on self-esteem.[79]

The mean, baseline-adjusted sugar-sweetened beverage intake among the girls at 12 weeks was significantly different by groups: 2.4 servings per day for those in the child-targeted group, 1.5 servings per day for those in the parent-targeted group, and 3.0 servings per day for those in the comparison group. These results suggest that interventions that include parents or caregivers may provide the greatest benefit.[79]

A study in Chile examined the effect of increasing the availability of milk at home on body composition among 98 children aged 8–10 years who regularly consumed sugar-sweetened beverages. Children were randomly assigned to intervention and control groups. During the 16-week study, children in the intervention group were counseled to drink 3 servings of milk daily and to avoid consuming sugar-sweetened beverages. Parents were asked to remove sugar-sweetened beverages from the home. A supply of flavored milk (80 kcal/200 ml per serving) was delivered to the homes of enrolled children weekly.[76] (Note: Skim milk has 69 kcal/200 ml per serving.[75])

Among children in the intervention group, milk consumption increased significantly by 453 g

per day (16 ounces/day) and sugar-sweetened beverage consumption decreased by 711 g per day (25 ounces/day). For the control group, milk consumption did not change, and sugar-sweetened beverage consumption increased by 72 g per day (2.5 ounces/day). Changes in percentage body fat, body weight, and BMI were not different between groups.[76]

In another randomized controlled trial, 103 U.S. adolescents aged 13–18 years who regularly consumed sugar-sweetened beverages were assigned to intervention and control groups. Noncaloric beverages were delivered to the homes of adolescents in the intervention group for 25 weeks. The adolescents enrolled in the intervention group were discouraged from drinking sugar-sweetened beverages through instructions given by telephone or sent through the mail. In this study, daily consumption of sugar-sweetened beverages decreased by 82% in the intervention group, while there was no change in the control group.[26]

Among adolescents with the highest BMIs (the top one-third) at the beginning of the study, those in the intervention group reported a significantly lower increase in BMI by the end of the study compared with those in the control group. Among those with the lowest BMIs (the bottom one-third), the change in BMI for adolescents in the intervention group was lower than the change for adolescents in the control group, but the difference was not significant.[26]

Choice, Control, and Change (C3) was a formative evaluation of a middle school curriculum designed to foster healthful eating and physical activity. C3 was conducted in 19 science classes in 5 U.S. middle schools and used a pretest-posttest evaluation design without a control group. The C3 curriculum consisted of 24 lessons taught by science teachers on most school days over 7–8 weeks. The evaluation demonstrated that science-based education could improve the diet of students over the study period, including a reduction in sugar-sweetened beverage intake.[80] The weekly consumption of soft drinks among participating students significantly decreased, from 4.5 days per week at baseline to 4.2 days per week at follow-up. The consumption of noncarbonated sugar-sweetened beverages decreased from 4.8 days per week to 4.1 days per week.[80]

Key Considerations

Some of the more healthful alternative beverage choices, such as flavored milk and 100% juice, contain a substantial number of calories per serving. Therefore, it is important to monitor the quantity and frequency of consumption of these beverages in relation to dietary quality and individual calorie needs as described in the *Dietary Guidelines for Americans 2005*.[81] The IOM school nutrition beverage guidelines recommends that milk be limited to low-fat or nonfat (or soy/lactose-free alternatives) and contain fewer than 22 g of total sugars per 8-ounce portion.[48] The American Academy of Pediatrics advises that daily consumption of 100% juice be limited to one 4–6-ounce serving daily for young children and two 6-ounce servings for older children and adolescents.[82]

Although artificially sweetened beverages (e.g., diet soft drinks) have a sweet taste and fewer calories, the evidence regarding the effectiveness of artificial sweeteners as a weight management strategy is inconsistent.[83]

As outlined by the National Food Service Management Institute, efforts to promote more healthful beverages to students may be more effective when they

- Identify and address the explicit rewards and barriers perceived by the intended audience.

- Provide simple, strong, repetitive, consistent, and specific messages about the desired behavior.
- Promote benefits in terms of taste instead of nutrition.
- Be upbeat to engage and excite children and teenagers.
- Convince children and teenagers that selecting nutritious foods is easy to do.
- Present information in a catchy and easily recalled format.[84]

Self-reports from schools working to improve the nutrient quality of beverages and foods sold to students indicate that increasing the availability of more healthful options does not reduce revenue from competitive foods.[85]

Of the 17 schools that reported income data for the report *Making It Happen! School Nutrition Success Stories*, 12 schools increased their revenue as a result of the changes made to increase the availability of healthful beverages and foods, and 4 schools reported no change.[85]

Action Steps

1. Develop or adopt healthy beverage policies for different priority settings for obesity prevention and monitor to ensure effective implementation. For example, schools can adopt healthy beverage policies that are based on the IOM's school nutrition beverage guidelines.[48]
2. Develop beverage-purchasing policies that requires that beverages be provided in container sizes that are age appropriate and suitable for each beverage type.
3. Develop and promote the adoption of healthy beverage policies for meetings, events, and other activities.
4. Provide resources and training on how to select more healthful beverages for meetings and events to food service personnel and those who order catering for meetings and events.
5. Provide information to the general public on the potential benefits of healthful alternatives to sugar-sweetened beverages.
6. Communities can work with state, local, and city government officials and the food service industry to post beverage calorie information as part of point-of-purchase and menu-labeling initiatives.
7. Schools and child care facilities can collaborate with school district officials and child care officials to monitor the availability of more healthful alternatives to sugar-sweetened beverages in schools and child care facilities.
8. Provide education on the potential health effects of sugar-sweetened beverages to teachers, parents, and other influential adults and emphasize their role as models for healthy beverage consumption.
9. Incorporate training on nutrition and healthy beverage choices into existing teacher training curricula.
10. Provide training, technical assistance, and support to guide the development and maintenance of a healthy beverage environment in schools and child care facilities.
11. Assess whether nutrition education is a part of the core curriculum for students and whether beverage consumption is a part of this curriculum.

Program Examples

Santa Clara County Healthy Food and Beverage Policy

Officials in Santa Clara County, California, passed legislation that requires that 50% of the beverages sold in county vending machines meet specific nutrition guidelines. Beverages that meet the nutrition guidelines include

- Water.
- 100% fruit juices with no additives.
- Nonfat, 1%, and 2% nonflavored milk.
- Plant-derived milk (i.e., soy, rice, and others).
- Artificially sweetened, calorie-reduced beverages that do not exceed 50 calories per 12-ounce container.
- Other noncaloric beverages.[86]

County officials also set nutrition standards for county-sponsored meals and events.[86]

Aptos Middle School, San Francisco Unified School District

A pilot study was conducted in Aptos Middle School, San Francisco's most racially diverse middle school, to assess the effectiveness of changes to the school's policies on vending machines and à la carte food. As part of the study, all soft drinks were removed from the vending machines located in the physical education (PE) department and replaced with bottled water.[85]

Following the change, students bought more bottles of water than they did soft drinks when soft drinks were available. Because the water bottles were larger and sold for a higher price, vending machine revenues increased in the PE department. Soft drinks also were removed from the à la carte line in the cafeteria and replaced with water, milk, and 100% juice (no more than 12 ounces per serving), and healthier food options were added to the menu.[85]

Since the changes, à la carte revenues have remained similar to sales before the changes. However, net revenues have increased because the costs to the cafeteria to buy more healthful items are lower. The Aptos cafeteria ended the 2002-2003 school year with a surplus of $6,000.[85]

South Dakota Work Site Sodabriety Healthy Challenge

In May 2008, Healthy South Dakota conducted the Sodabriety Healthy Challenge, one of a series of online challenges for work sites.[87] The purpose was to get South Dakotans to drink more water and fewer sugar-sweetened beverages. More than 1,000 registered participants completed beverage consumption records online. Participants were primarily women aged 20–59 years, and more than half were state government workers.[87]

Results from an online questionnaire sent to participants after the 1-month Sodabriety Challenge showed that

- 88% of participants increased their water intake.
- 74% decreased their sugar-sweetened beverage intake.
- 78% increased their knowledge of the health effects of sweetened beverages.
- 77% had maintained their increased water intake since the challenge ended (for 1 month).[87]

Resources

Healthy Beverages Community Action Kit
Indian Health Service
Action plans to promote increased consumption of more healthful beverages.
http://www.ihs.gov/MedicalPrograms/Nutrition/

Positioned for Change: Decreasing Sugar-Sweetened Beverages
Texas Department of State Health Services
Video series educates and inspires communities into action against obesity.
http://www.dshs.state.tx.us/obesity/growingcommunity/default.shtm

Dietary Sugars Intake and Cardiovascular Health
American Heart Association
Recommendations on specific levels and limits on added sugar consumption.
http://americanheart.mediaroom.com/index.php?s=43&item=800

Nutrition Standards for Foods in Schools: Leading the Way Toward Healthier Youth
Institute of Medicine
Nutrition standards for K–12 schools, with a focus on competitive foods.
http://www.iom.edu/CMS/3788/30181/42502.aspx

Making it Happen! School Nutrition Success Stories
U.S. Department of Agriculture and Centers for Disease Control and Prevention
Collection of approaches implemented by more than 30 schools and school districts.
http://www.fns.usda.gov/tn/Resources/makingithappen.html

Marketing Nutrition in the Middle Grades: Adolescent Food Habits and Marketing Strategies That Work
National Food Service Management Institute
Effective marketing strategies that apply to adolescents and middle-grade students.
http://www.cde.state.co.us/cdenutritran/download/pdf/Marketiiddlegrade.pdf

Nutrition and Physical Activity Self Assessment for Child Care
Assessment tool, implementation plan, and policy information to change the nutrition and physical activity environment of child care facilities.
http://www.napsacc.org/

Guidelines for Healthy Meetings
New York Department of Health
Suggestions for making work site meetings healthy, including general information and specific recommendations for food options.
http://www.health.state.ny.us/nysdoh/prevent/guidelines.htm

Meeting Well: A Tool for Planning Healthy Meetings and Events
American Cancer Society
A tool to help companies organize meetings and events with good health in mind.
http://www.acsworkplacesolutions.com/meetingwell.asp

Strategy 4. Limit marketing of sugar-sweetened beverages and minimize marketing's effect on children

Definition

Sugar-sweetened beverages are extensively advertised and promoted to encourage their purchase. Efforts to reduce sugar-sweetened beverage consumption might include working to reduce the marketing of these beverages or to counter their marketing through media literacy training for children and other consumers.

Rationale

In a 2006 report, the IOM concluded that beverage and food marketing influences children's preferences, purchase requests, and consumption. The IOM also noted that beverage and food marketing is a likely contributor to the consumption of less healthful diets. In addition, consumption of a less healthful diet contributes to negative diet-related health outcomes.[77]

Consumer advertising and marketing is regulated almost exclusively at the federal level. However, there are no federal regulations on the advertising of sugar-sweetened beverages. In 2006, the Federal Trade Commission and the U.S. Department of Health and Human Services issued a report urging the food marketing industry to take specific steps to change its marketing to children to help address childhood obesity.[88]

Recently, the Council of the Better Business Bureau established guidelines on child-directed advertising of beverage and food products.[89] Since then, several beverage companies have agreed to voluntarily discontinue advertising sugar-sweetened beverages directly to children younger than age 12 and to instead promote products identified by the industry as those that contribute to more healthful dietary choices and healthy lifestyles.[89]

However, no federal guidelines have been established to define more healthful products or monitor compliance with these voluntary restrictions.

The nonalcoholic beverage industry is very competitive, so hundreds of new products are introduced each year. In 1999, this industry (excluding the dairy industry) spent more than $500 million on magazine and network television advertising.[90] Because carbonated soft drinks have very high brand loyalty among teenagers, many beverage and food marketers have increased their efforts to develop brand relationships with young consumers.[77]

Although the marketing of beverage and food products on the Internet and through other digital media is increasing, television remains the leading medium for targeting children and adolescents.[7] The amount of time spent watching television has been associated with sugar-sweetened beverage intake.[91] Each 1-hour increment of television viewing per day is associated with higher consumption of sugar-sweetened beverages (0.06 servings/day), although this amount is likely not nutritionally significant.[10]

The extent of soft drink advertising in schools is positively associated with existence of a pouring contract, subscription to Channel One (national in-school television news network for teenagers), and receipt of incentives from soft drink bottlers based on sales. Soft drink advertising in schools is negatively associated with daily participation in the National School Lunch Program.[59]

Another study reported that 19 (39%) of the 51 largest school districts in each state and the District of Columbia had competitive food

policies beyond state or federal requirements during 2004–2005. Of those 19 school districts, only 5 (26%) had policies that addressed marketing to students.[61]

Evidence of Effectiveness

Research that evaluates the effect of minimizing advertising of sugar-sweetened beverages to children on their consumption is limited. A study that followed children in grades 6 and 7 for 19 months showed that higher rates of television viewing are associated with higher total calorie intake among adolescents in the United States. This association was mediated by an increasing intake of foods that were commonly advertised on television, including sugar-sweetened beverages. This study indicated that many adolescents seem to eat foods that were advertised on television.[92]

In 2006, the IOM conducted a systematic evidence review to assess the influence of marketing on the diet of children and adolescents. In the resulting report, the IOM concluded that television beverage and food advertising directed at children and adolescents that promotes high-calorie and low-nutrient products influences children to favor and demand high-calorie and low-nutrient beverages and foods. The IOM also concluded that there is strong evidence that television advertising influences the short-term consumption habits of children aged 2–11 years, but insufficient evidence for adolescents aged 12–18 years. Additionally, there is moderate evidence that television advertising influences the typical dietary intake of children aged 2–5 years and weak evidence for children aged 6–11 years.[77]

A mathematical simulation model was constructed to estimate the possible effects of decreasing exposure to food advertising on television on the prevalence of obesity among U.S. children aged 6–12 years. The model estimated that decreasing exposure to television food advertising to zero would reduce the mean BMI by 0.38 kg/m^2. It also would reduce the prevalence of obesity from 17.8% to 15.2% (95% uncertainty interval: 14.8%–15.6%) for boys and from 15.9% to 13.5% (95% uncertainty interval: 13.1%–13.8%) for girls.[93]

Action Steps

1. Eliminate advertising of sugar-sweetened beverages directed at children.
2. Develop or adopt policies that limit advertising of sugar-sweetened beverages in public service venues.
3. Collaborate with food manufacturers, retailers, restaurants, and others to adopt guidelines for responsible food marketing to children.
4. Incorporate media literacy training into school and child care curricula.
5. Redefine beverage pouring contracts to eliminate advertising in schools.

Key Considerations

Advertising and marketing messages are disseminated through an array of media (e.g., television, magazines, cell phones, Internet) and in many different venues, such as grocery stores, shopping malls, and movie theaters.

Program Examples

State of Maine's School Advertising Policy
State law in Maine prohibits brand-specific advertising of foods or beverages in school buildings or on school grounds except for beverages and food that meet established nutrition standards. Maine is the only state known to have enacted legislation to limit advertising in the schools.[94]

San Francisco Unified School District's Commercial-Free School Act
The Commercial-Free School Act restricts advertising of commercial products within the San Francisco Unified School District. It also prohibits the school district from entering into an exclusive contract with a soft drink or snack food company, commits to making healthy drinks and snacks available to students, and eliminates the purchase or use of curriculum materials that feature brand names.[95]

Resources

Marketing Food to Children and Adolescents: A Review of Industry Expenditures, Activities, and Self-Regulation
Federal Trade Commission
Overview of food and beverage industry efforts to market to children and adolescents.
http://www.ftc.gov/os/2008/07/P064504foodmktingreport.pdf

Food Marketing to Children and Youth: Threat or Opportunity?
Institute of Medicine
Recommendations for effective marketing and advertising strategies that promote more healthful foods, beverages, and meals to children and youth.
http://iom.edu/CMS/3788/21939/31330.aspx

Guidelines for Responsible Food Marketing to Children
Center for Science in the Public Interest
Health-promotion criteria for marketing to children.
http://www.cspinet.org/marketingguidelines.pdf

Captive Kids: Selling Obesity at Schools. An Action Guide to Stop the Marketing of Unhealthy Foods and Beverages in School
California Project LEAN
Tool kit with policy development guidance, talking points, fact sheets, and other resources to improve the school nutrition environment.
http://www.californiaprojectlean.org/doc.asp?id=174

Strategy 5. Decrease the relative cost of more healthful beverage alternatives through differential pricing of sugar-sweetened beverages

Definition

This strategy increases the price of sugar-sweetened beverages relative to other more healthful beverages through pricing adjustments, subsidies, or other differential pricing strategies.

Rationale

Price has been shown to be a key determinant of food choices.[96] Several strategies have been proposed to reduce sugar-sweetened beverage consumption, including pricing adjustments and subsidies. Reducing prices of more healthful beverages or increasing prices of sugar-sweetened beverages may be effective strategies for reducing consumption of sugar-sweetened beverages. Pricing strategies could encourage positive behaviors and discourage negative behaviors. A combination of pricing strategies that include a mix of subsidies and price increase may be the most effective way to accomplish this goal.[97]

Pricing adjustments on sugar-sweetened beverages have the potential to (1) discourage their consumption, (2) equalize the costs of healthier and less healthful foods, (3) encourage the production of healthier foods, and (4) generate revenue that could be dedicated to obesity prevention.[97,98]

Evidence of Effectiveness

According to the National Food Stamp Program Survey in the United States, researchers estimated that a 10% increase in the price of soft drinks would lead to an 8% reduction in consumption among low-income households. A 10% reduction in milk price was estimated to increase the consumption of reduced-fat milk by 14%.[41]

The effect of price interventions on soft drink consumption can vary substantially depending on baseline consumption status. According to a paper prepared for the Congress of the European Association of Agricultural Economists, people who drink greater amounts of sugar-sweetened beverages are more sensitive to price increases and less likely to drink sugar-sweetened beverages as prices increase in Norway.[99]

In this study, increasing the price of soft drinks by 11% was estimated to decrease consumption by nearly 7% among consumers with the lowest use and 17% among consumers with the highest use. Increasing the price by 27% was associated with a drop in consumption of 17% among the lowest use group and 44% in the highest use group, with an overall 24% reduction in consumption across the population. This larger increase would reduce consumption of sugar-sweetened sodas by 2 liters per year among consumers with moderate use and by 74 liters per year among those in the top 5% consumption level.[99]

Reducing prices of more healthful foods has been shown to increase their sales. For example, a study of restaurant purchases reported that a 25% price reduction for salads was associated with a doubling in sales.[100] Another study examined effects of pricing and promotion strategies on purchases of low-fat snacks from vending machines. Price reductions of 10%, 25%, and 50% on low-fat snacks were associated with increases in the sale of these snacks by 9%, 39%, and 93%, respectively.[101]

Key Considerations

- Pricing adjustments and subsidies—with the clear purpose of benefiting specific groups, such as children—are more likely to gain public support but less likely to influence consumption or lead to meaningful decreases in BMI.[97]
- Pricing initiatives designed to affect consumption should consider all sugar-sweetened beverages, not just focus on soft drinks.
- Revenues from pricing adjustments for sugar-sweetened beverages should be earmarked for support programs to prevent obesity.

Program Examples

Seattle Public Schools' Policy on the Distribution and Sale of Competitive Foods

The Seattle Public Schools' policy on competitive foods requires that all beverages except milk be priced higher than the price for bottled water for an equal-sized serving. In addition, vendor contracts for the sale of competitive foods shall not include incentives for increasing students' consumption of foods or drinks.[102]

University of Virginia Health System's Snack Smart Healthy Vending Program

The University of Virginia Health System's Healthy Vending Program uses colored stickers and a pricing incentive to encourage healthy beverage consumption. Red stickers are used to indicate which beverages, including regular sodas, tea, and lemonade, are the least healthy. A 5-cent surcharge is added to the cost of these items.

Yellow stickers indicate beverages that can be consumed "once in a while." These include fruit drinks (<100% juice) and sports drinks. Green stickers are used to indicate the healthiest

Action Steps

1. Build a coalition to advocate for and support the use of pricing adjustments to influence sugar-sweetened beverage consumption.
2. Develop guidelines for voluntary implementation of price adjustments in vending machines and other venues to encourage healthy beverage consumption.
3. Sponsor a meeting with key decision makers to discuss the options for beverage pricing adjustments.

choices, including water, 100% juice, and diet beverages. Funds raised from red labeled items are used to support the University of Virginia's Children's Fitness Clinic.

After the first year of implementation, overall sales increased 8%. Sales of red label items decreased 5%, yellow label items increased 31%, and green label items increased 1.5%. The 5-cent surcharge raised $6,700 for the Children's Fitness Clinic.[103]

Resource

Positioned for Change: Decreasing Sugar-Sweetened Beverages
Texas Department of State Health Services
Video series educates and inspires communities into action against obesity.
http://www.dshs.state.tx.us/obesity/growingcommunity/default.shtm

Strategy 6. Include screening and counseling about sugar-sweetened beverage consumption as part of routine medical care

Definition

Screening and advice from primary care providers on sugar-sweetened beverage consumption practices and associated risks done as part of routine medical and dental care visits.

Rationale

Primary health care visits provide a unique opportunity for creating awareness and motivating change about the consumption of sugar-sweetened beverages because primary care providers had direct contact with about 76% of U.S. children and youth younger than aged 18 years in 2004.[104] The U.S. Preventive Services Task Force recommends that clinicians screen children and adolescents aged 6–18 years for obesity. Clinicians can either offer or refer children and adolescents to comprehensive, intensive counseling and behavioral interventions to improve weight status.[105]

The Expert Committee on the Assessment, Prevention, and Treatment of Child and Adolescent Overweight and Obesity recommends that, at a minimum, health care providers assess the dietary patterns of all pediatric patients at each well-child visit and provide preventive guidance. The committee recommends that this assessment include the identification of excessive consumption of sugar-sweetened beverages.[106]

In addition, the National Committee for Quality Assurance has added two new measures related to obesity to the 2009 Healthcare Effectiveness and Data Information Set (HEDIS). The HEDIS is the most commonly used quality performance measurement set in medical care. The new measures will assess physician performance for BMI measurements among adults and children and track physician counseling for nutrition and physical activity among children.[107]

Sugar-sweetened beverage consumption also has been linked to increased risk for dental caries,[37] and dental care providers, including general and pediatric dentists, can be important primary care partners in the effort to reduce sugar-sweetened beverage consumption. The American Academy of Pediatric Dentistry recommends that all children should see dental professionals in their first year of life and at least every 6 months thereafter, depending on their risk status.[108]

The American Academy of Pediatric Dentistry also encourages the following efforts to reduce the consumption of sugar-sweetened beverages:

- Dentists and medical care providers should educate their patients about the negative effects of frequent sugar-sweetened beverage consumption (carbonated and noncarbonated) on infant, child, and adolescent nutrition, oral health, and general health, including obesity.
- School officials and parent groups should think about the importance of maintaining healthy choices in school vending machines and promote beverages with high nutritional value. Bottled water and other more healthful alternatives should be made available in vending machines instead of soft drinks.[109]

Evidence of Effectiveness

The Keep ME Healthy (or the 5-2-1-0) program was developed by the Maine Youth Overweight Collaborative to support obesity prevention

efforts in the clinical setting (see Program Examples). The collaborative evaluated use of this program framework among primary care practices. Study results indicated that the percentage of parents or caregivers who reported that a doctor, nurse, or other office staff member spoke with them about sugar-sweetened beverages increased 30%–50% among primary care providers who used the framework.[110]

About 90% of parents or caregivers of obese patients reported that someone in the primary care practice had talked with them about sugar-sweetened beverages, and 40% reported that a beverage goal was set to change behavior.[110]

Key Considerations

- In general, time available for physicians to do nutrition screening and counseling is limited.[111]
- Availability of insurance reimbursement for preventive nutrition counseling may be limited.[112]

Program Examples

Keep ME Healthy

The Maine Youth Overweight Collaborative, together with the Maine chapter of the American Academy of Pediatrics, developed four key messages to guide obesity prevention in the clinical setting. The Keep ME Healthy program, also called the 5-2-1-0 Program, encourages people to eat 5 or more servings of fruits and vegetables on most days; limit screen time to 2 hours or less daily; participate in at least 1 hour or more of physical activity daily; and avoid (0) sugar-sweetened beverages, limit fruit juice to one-half cup or less daily, and drink water and 3–4 servings of nonfat milk daily.[110]

Action Steps

1. Support implementation of the recommendations of the Expert Committee on the Assessment, Prevention, and Treatment of Child and Adolescent Overweight and Obesity to ensure screening and counseling for high sugar-sweetened beverage consumption as part of all well-child visits.
2. Develop and promote the use of decision prompts and tools to help primary care providers assess and provide advice on sugar-sweetened beverage consumption for their patients.
3. Support efforts to ensure reimbursement for health care providers' time spent providing nutrition counseling.

An evaluation of the program indicated that patients attending clinics that adopted the 5-2-1-0 framework were more likely to speak with their medical care providers about their beverage consumption practices, and these patients were more likely to set goals related to their sugar-sweetened beverage consumption.[110]

As a result of the success of the Keep ME Healthy program, the American Academy of Pediatrics has developed a new Pediatric Obesity and Nutrition Resource Package that includes a flip chart adapted from the Keep ME Healthy program that can be used by medical care providers as a decision-support tool. In addition, the Nemours Health and Prevention Services used the Keep ME Healthy framework to create the "5-2-1-Almost None" strategy to promote its healthy lifestyle theme.[113]

Alliance for a Healthier Generation's Alliance Healthcare Initiative

The Alliance Healthcare Initiative is a collaborative effort between national medical associations, leading insurers, and employers to offer comprehensive health benefits to children and families for the prevention, assessment, and treatment of childhood obesity. Through this program, doctors are reimbursed for bringing children back for follow-up visits and for working with them on the adoption of healthy behaviors. Registered dietitians also are reimbursed for providing in-depth nutrition counseling over multiple visits to children referred by their doctors.

By working together, doctors and dietitians help children and their families adopt more healthful eating habits to improve their health and weight. Participating companies have access to materials and resources developed by the alliance to inform parents about childhood obesity prevention and treatment.[114] To date, the effectiveness of this initiative has not been evaluated.

Resources

Barlow SE and the Expert Committee. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: summary report. Pediatrics. 2007;120(Suppl 4):S164-192.

This report advises pediatric physicians on how to assess dietary behaviors, including sugar-sweetened beverage consumption, and promote healthy dietary behaviors.
http://pediatrics.aappublications.org/cgi/reprint/120/Supplement_4/S164

Pediatric Obesity and Nutrition Resource Package

American Academy of Pediatrics
This package includes pediatric obesity prevention, intervention, and treatment strategies for primary care, the pediatric obesity clinical decision support chart, and a parent's guide to childhood obesity.
https://www.nfaap.org/netforum/eweb/DynamicPage.aspx?webcode=aapbks_productdetail&key=72d080ff-2b54-48c6-afba-8609a35109f5

At the Doctor

Alliance for a Healthier Generation
The Alliance HealthCare Initiative was developed to address childhood obesity by focusing on prevention and assessment by primary caregivers.
http://www.healthiergeneration.org/healthcareprofessionals.aspx?id=294

Strategy 7. Expand the knowledge and skills of medical care providers to conduct nutrition screening and counseling on sugar-sweetened beverage consumption

Definition

Increase the knowledge and skills of medical care providers so they can offer or refer patients to comprehensive, intensive counseling and behavioral interventions to improve their weight status and sugar-sweetened beverage consumption practices through core training and continuing education.

Rationale

Evidence suggests that clinicians have a wide range of training and experience in nutrition counseling. However, some medical care providers report low confidence in their ability to provide nutrition and lifestyle counseling.[115,116] One research study demonstrated that one of the most common areas of self-perceived low proficiency among U.S. pediatricians, pediatric nurse, and registered dietitians was counseling-related skills needed to manage childhood obesity effectively.[115]

Although there is increased concern about childhood obesity and diet-related diseases, medical training programs continue to lack nutrition education. A study conducted in the United States reported that among 61 internal medicine interns, 62% reported receiving nutrition education in undergraduate, graduate, or medical schools. About 31% of medical schools offered a nutrition elective, but only 3% of interns took the course. Furthermore, when their knowledge of nutrition assessment, endocrine disease, cardiovascular disease, gastrointestinal disease, renal disease, and pulmonary disease was tested, the average correct score among the students was 66%.[116]

When test scores were broken down by topic areas, the mean score for nutrition knowledge was only 62%. About 77% of the interns agreed that nutrition assessment should be incorporated into routine primary care visits, and almost all of the interns (94%) agreed that it is their job to provide nutrition counseling. However, 86% agreed that most physicians are not trained to provide nutrition counseling to their patients.[116]

There is a need to increase physician counseling on diet and physical activity. One option is for medical schools to provide nutrition education to improve the counseling skills of medical students as a part of their curricula.[117] This information should include the childhood obesity expert committee recommendation to limit consumption of sugar-sweetened beverages as one of seven behaviors for which evidence consistently shows an association between the recommended behavior and either obesity risk or energy balance.[106]

The American Heart Association highlights the importance of reducing the intake of sugar-sweetened beverages to minimize cardiovascular disease risks in its guide for medical care providers on how to make dietary recommendations for children and adolescents.[118] In addition, the American Academy of Pediatrics' Committee on School Health has issued a policy statement intended to inform pediatricians and other health care providers about nutritional concerns related to soft drink consumption in schools.[119]

In addition to nutrition knowledge, medical care providers need to build skills in effective counseling techniques. A common technique is motivational interviewing, which is a directive, client-centered counseling style that facilitates behavior change.[120] Motivational interviewing has been used by public health professionals, dietitians, and other health professionals to address various behaviors related to chronic disease, including childhood obesity.[121]

Evidence of Effectiveness

A study was conducted to evaluate the effect of an innovative preventive medicine and nutrition course offered at the Harvard Medical School on medical students' confidence to provide diet and exercise counseling. A 28-hour preventive medicine and nutrition course was given to second-year medical school students. Survey data were collected from 134 students before the course and from 118 students after the course. The study reported that the course significantly improved the students' confidence to provide diet and exercise counseling. This improvement could influence the students' practice patterns when they become doctors.[117]

An intervention study was conducted to examine the effect of nutrition education provided by a specialist on physicians' nutrition knowledge, physicians' nutritional counseling practice, and patients' reports of nutritional counseling. For 6 months, a physician nutrition specialist provided family physicians (7 faculty members and 9 residents) with individualized recommendations for nutrition-related topics that should be discussed with their patients.

These recommendations were given in detachable notes placed in the charts of patients or through discussions with the physicians. Additionally, the specialist gave a lecture on nutrition-related disease and recommendations for healthy diets to family physicians during family practice inpatient rounds.[122,123]

Information about the nutrition knowledge of physicians and patients was collected before and after the intervention. This study reported that the nutrition intervention significantly increased knowledge scores from 73% to 76% for physicians and from 46% to 50% for their patients. Furthermore, the frequency with which physicians asked their patients about nutrition and diet increased significantly, from 26% to 40%.[122,123]

The Maine Youth Overweight Collaborative intervention was used to determine whether an intervention used among pediatric primary care providers can improve physician practice, as well as patient and family behaviors, in order to reduce childhood obesity. Participating intervention sites received packages of decision support tools for providers and counseling and self-management support tools for patients and their families.[124]

During the 18-month intervention, significant changes occurred in providers' efforts to identify, prevent, and treat childhood obesity and in the ability of patients and their families to manage risk behaviors for childhood obesity. Primary care providers increased the frequency of assessments

Action Steps

1. Collaborate with professional associations of national and state health care providers to provide continuing education for primary care providers to enhance their dietary assessment and counseling skills in regard to sugar-sweetened beverage consumption.
2. Collaborate with schools of medicine, nursing, dentistry, and other allied health professions to incorporate training on nutrition and effective counseling techniques as a part of core curricula.

of BMI and BMI percentiles for age and sex, use of the 5-2-1-0 behavior screening tool, and classification of patients' weight status. They also reported improvements in knowledge, attitudes, self-efficacy, and practice.[124]

Key Considerations

There are many competing interests for material to be covered in the core training curriculum and in continuing education for medical care providers.

Program Example

Sugar-sweetened Beverage Training for Dental Students
An intervention study was conducted to increase knowledge related to oral and systemic health effects of soda consumption among dental students in the United States. An educational brochure was distributed to first-year dental students during a lecture. This lecture focused on the effects of soda consumption on oral and systemic health.[125]

After a combination of written (brochure) and oral (lecture) education, first-year dental students significantly improved both their knowledge and behavioral intent related to soda consumption. This accumulated knowledge among dental students can be incorporated into dental caries risk assessments conducted with their patients.[125]

Resources

Educating Physicians on Controversies and Challenges in Health: Motivating Patients to Change Behavior
American Medical Association
Continuing medical education course on the use of motivational interviewing.
http://www.bigshouldersdubs.com/clients/AMA/22-AMA-Motivating.htm

Counter Details: Pediatric Obesity Management
Pennsylvania Department of Health and Pennsylvania Medical Society
Offers continuing education credits through December 31, 2012.
http://www.portal.state.pa.us/portal/server.pt/document/445943/pediatricobesity_pdf?qid=60018448&rank=1

5-2-1-0 Pediatric Obesity Clinical Decision Support Chart
Adapted from the Keep ME Healthy flip chart developed by the Maine Center for Public Health and the Maine Chapter of the American Academy of Pediatrics.
https://www.nfaap.org/netforum/eweb/DynamicPage.aspx?webcode=aapbks_productdetail&key=3ffed110-2471-40f3-9547-61666fa5b6ed#

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