

Summary of CPSTF Findings and Evidence: Intervention Approaches to Prevent and Control Obesity in Schools

What Did the CPSTF Review?




The [Community Preventive Services Task Force \(CPSTF\)](http://www.thecommunityguide.org/task-force/about-community-preventive-services-task-force) [www.thecommunityguide.org/task-force/about-community-preventive-services-task-force] systematically reviewed four interventions that focus on healthy eating alone and four interventions that focus on healthy eating combined with physical activity.

- **Healthy eating intervention** approaches included school meals, school snacks, classroom celebration rules, or water access, which align with the Centers for Disease Control and Prevention's (CDC) [School Nutrition Environment Framework](http://www.cdc.gov/healthyschools/nutrition/pdf/School_Nutrition_Framework_508tagged.pdf) [www.cdc.gov/healthyschools/nutrition/pdf/School_Nutrition_Framework_508tagged.pdf]
- **Physical activity intervention** approaches included increased opportunities for physical activity during the school day or school physical education improvements, which align with the CDC's and Shape America's: [Comprehensive School Physical Activity Program](http://www.cdc.gov/healthyschools/physicalactivity/pdf/13_242620-A_CSPAP_SchoolPhysActivityPrograms_Final_508_12192013.pdf) [www.cdc.gov/healthyschools/physicalactivity/pdf/13_242620-A_CSPAP_SchoolPhysActivityPrograms_Final_508_12192013.pdf]




What Role Can Schools Play?

Most U.S. children aged 5-18 years attend school for an average of six to seven hours per day (National Center for Education Statistics, 2007-2008). Many schools have implemented programs and policies that provide students opportunities for healthy eating and physical activity. CDC promotes the [Whole School, Whole Community, Whole Child \(WSCC\)](http://www.cdc.gov/healthyschools/wsc/index.htm) [www.cdc.gov/healthyschools/wsc/index.htm] model—a framework for school-based health that involves schools, parents, caregivers, community organizations, and health care providers.



Outcomes and Summary of Findings

Intervention Approach	CPSTF Finding	Fruit Vegetable Intake	Low Nutrient Food Intake	Sugar Sweetened Beverage Intake	Water Intake	Physical Activity Results	Healthy Weight Results
Healthy Eating Interventions in Schools							
Multicomponent Interventions to Increase Availability of Healthier Foods and Beverages in Schools (11 studies)	 Recommended* (sufficient)	Too Few Studies ⁺	Too Few Studies ⁺	Too Few Studies ⁺	No Studies	Outcome not targeted	Favorable Results
Meal or Fruit and Vegetable Snack Interventions to Increase Healthier Foods and Beverages Provided by Schools (25 studies)	 Recommended* (sufficient)	Favorable Results	Too Few Studies ⁺	Outcome not targeted	Outcome not targeted	Outcome not targeted	Favorable Results
Supporting Healthier Snack Foods and Beverages Sold or Offered in Schools (13 studies)	 Insufficient Evidence (mixed results)	Outcome not targeted	Too Few Studies ^o	Mixed Results	Too Few Studies ⁻	Outcome not targeted	Too Few Studies ⁺

Outcomes and Summary of Findings

Intervention Approach	CPSTF Finding	Fruit Vegetable Intake	Low Nutrient Food Intake	Sugar Sweetened Beverage Intake	Water Intake	Physical Activity Results	Healthy Weight Results
Increasing Water Access in Schools (2 studies)	 Insufficient Evidence (too few studies)	Outcome not targeted	Outcome not targeted	Too Few Studies ^o	Too Few Studies ⁺	Outcome not targeted	Too Few Studies ^o
Healthy Eating Interventions Combined with Physical Activity Interventions in Schools							
Meal or Fruit and Vegetable Snack Interventions Combined with Physical Activity Interventions in Schools (21 studies)	 Recommended* (sufficient)	Favorable Results	Mixed Results	Outcome not targeted	Outcome not targeted	Favorable Results	Favorable Results
Supporting Healthier Snack Foods and Beverages Sold or Offered Combined with Physical Activity Interventions in Schools (4 studies)	 Insufficient Evidence (mixed results)	Outcome not targeted	Too Few Studies ^o	Too Few Studies ^o	No Studies	Too Few Studies ⁺	Mixed Results

Outcomes and Summary of Findings

Intervention Approach	CPSTF Finding	Fruit Vegetable Intake	Low Nutrient Food Intake	Sugar Sweetened Beverage Intake	Water Intake	Physical Activity Results	Healthy Weight Results
Multicomponent Interventions (Meal or Fruit and Vegetable Snack Interventions + Healthier Snack Foods and Beverages) Combined with a Physical Activity Intervention in Schools (14 studies)	 Insufficient Evidence (mixed results)	Mixed Results	Too Few Studies	Mixed Results	Too Few Studies ^o	Mixed Results	Mixed Results
Increasing Water Access Combined with Physical Activity Interventions in Schools (1 study)	 Insufficient Evidence (too few studies)	Outcome not targeted	Outcome not targeted	Too Few Studies ⁺	No Studies	No Studies	Too Few Studies ⁻

*Recommended based on sufficient number of studies and favorable results of intervention-relevant dietary, physical activity, or weight-related outcomes

⁺Study results were favorable for outcome, but there were too few studies to issue a CPSTF recommendation

^oStudies reported no change in outcome

⁻Studies reported unfavorable results for outcome

Favorable results (Green) = meaningful intervention effect for recommendation outcome

Too few studies (Blue) = not enough studies to assess recommendation outcome

Mixed results (Yellow) = study results were inconsistent for recommendation outcome

Outcome not targeted (White) = review did not examine the outcome

[More information about the CPSTF findings and review results](#) is available at the end of this document.

What Does the CPSTF Recommend?

The CPSTF recommends the following:

1. [Meal or Fruit and Vegetable Interventions to Increase Healthier Foods and Beverages Provided by Schools](http://www.thecommunityguide.org/findings/obesity-meal-fruit-vegetable-snack-interventions-increase-healthier-foods-beverages-schools) [www.thecommunityguide.org/findings/obesity-meal-fruit-vegetable-snack-interventions-increase-healthier-foods-beverages-schools]
2. [Multicomponent Interventions to Increase Availability of Healthier Foods and Beverages in Schools](http://www.thecommunityguide.org/findings/obesity-multicomponent-interventions-increase-availability-healthier-foods-and-beverages) [www.thecommunityguide.org/findings/obesity-multicomponent-interventions-increase-availability-healthier-foods-and-beverages]
3. [Meal or Fruit and Vegetable Snack Interventions Combined with Physical Activity Interventions in Schools](http://www.thecommunityguide.org/findings/obesity-prevention-control-meal-fruit-vegetable-snack-interventions-combined-physical-activity-interventions-schools) [www.thecommunityguide.org/findings/obesity-prevention-control-meal-fruit-vegetable-snack-interventions-combined-physical-activity-interventions-schools]

Why Did the CPSTF Find Insufficient Evidence for Some of the Intervention Approaches?

A finding of *insufficient evidence* means there is not enough evidence to show that a particular intervention approach works. It does NOT mean that the intervention is ineffective; it means that additional research is needed to determine effectiveness.

Too Few Studies

The CPSTF found *insufficient evidence* for two of the intervention approaches because there were not enough eligible studies available for the systematic review.

1. [Increasing Water Access in Schools](http://www.thecommunityguide.org/findings/obesity-increasing-water-access-schools) [www.thecommunityguide.org/findings/obesity-increasing-water-access-schools]
2. [Increasing Water Access Combined with Physical Activity Interventions in Schools](http://www.thecommunityguide.org/findings/obesity-prevention-control-increasing-water-access-combined-physical-activity-interventions-schools) [www.thecommunityguide.org/findings/obesity-prevention-control-increasing-water-access-combined-physical-activity-interventions-schools]

Mixed Evidence

The CPSTF found *insufficient evidence* for three intervention approaches because systematic reviews found inconsistent results among the included studies. Below are suggested reasons why there may have been mixed evidence.

1. [Supporting Healthier Snack Foods and Beverages Sold or Offered in Schools](http://www.thecommunityguide.org/findings/obesity-supporting-healthier-snack-foods-and-beverages-sold-or-offered-rewards-schools) [www.thecommunityguide.org/findings/obesity-supporting-healthier-snack-foods-and-beverages-sold-or-offered-rewards-schools]

The systematic review included 13 studies that evaluated policies to improve vending machines or cafeteria à la carte items to meet nutritional guidelines or requirements. Most of the policies replaced less healthy food items with healthier food items (e.g., soda replaced with water or 100% fruit juice). Studies assessed students' dietary behaviors or weight status.

Results were inconsistent, with some showing favorable effects and others showing unfavorable or no effects. Nearly all of the studies predated USDA's [Smart Snacks](#) regulations, which went into effect during the 2014-15 school year (USDA, 2016).

Too few of the studies in this review reported enough information to determine whether policies were implemented as intended. In addition, this review reported outcomes at the student level rather than the school level. A previous systematic review (Chriqui et al., 2014) included a broader range of studies that examined availability or access to competitive foods and beverages and found interventions led to improvements within the school (i.e., foods and beverages deemed less healthy were removed from schools).

Most of the studies included in this review took place in middle or high schools, which may have contributed to inconsistent findings. It has been shown previously that diets become less nutrient-dense as students move into adolescence, and this may be related to increased autonomy, peer pressure, marketing of less healthful choices to teens, and more choices and opportunities for teens to choose less healthy foods (Lytle et al., 2002).

2. **Supporting Healthier Snack Foods and Beverages Sold or Offered Combined with Physical Activity Interventions in Schools**

[www.thecommunityguide.org/findings/obesity-prevention-control-supporting-healthier-snack-foods-beverages-sold-offered-combined-physical-activity-interventions-schools]

Four studies were included in this systematic review. Overall, findings were inconsistent for dietary, physical activity, and weight-related outcomes. Fidelity of implementation for these studies is unknown because too few reported whether interventions were implemented as intended. More studies are needed to adequately assess the effectiveness of this intervention approach.

3. **Multicomponent Interventions Combined with a Physical Activity Intervention in Schools** [www.thecommunityguide.org/findings/obesity-prevention-control-multicomponent-interventions-combined-physical-activity-intervention-schools]

The systematic review included 14 studies that assessed students' dietary and physical activity behaviors. Results were inconsistent, with some showing favorable effects and others showing unfavorable or no effects.

The CPSTF notes that fidelity of implementation may partially explain the mixed results. Four of the studies reported interventions were implemented as intended, or mostly as intended, and found favorable effects on dietary, physical activity, and weight-related outcomes. Eight studies that reported variability in implementation had inconsistent results. One study stratified results by high-, medium-, and low-implementing schools, and found that high- and medium-implementing schools had more favorable results than low-implementing schools. Two studies did not report on fidelity of implementation.

Grade level may also contribute to inconsistent findings. Most of the studies took place in middle or high schools. It has previously been shown that diets become less nutrient-dense as students move into adolescence, and this may be related to increased autonomy, peer pressure, marketing of less healthful choices to teens, and more choices and opportunities for teens to choose less healthy foods (Lytle et al., 2002).

Socioeconomic status (SES) of students may also be a factor since children from lower SES families are more likely to have poorer dietary intake and fewer opportunities for physical activity compared to children from higher SES families (Zarnoweicki, et al., 2014; WHO, 2007). In this review, 8 studies (57%), targeted schools in which most of the students were from lower SES families and reported mixed results. Within this set of school-based reviews, interventions that led to CPSTF recommendations had lower proportions of students from lower SES families.

Five included studies with mixed SES students found mostly favorable results for dietary and physical activity behaviors and weight-related outcomes. One study did not report students' SES. These findings suggest intervention effectiveness may vary by students' SES and suggest the need for additional research.

Intervention Components Glossary

Meal or Fruit and Vegetable Snack Interventions to Increase Healthier Foods and Beverages Provided by Schools

School meals meet specific nutrition requirements or school offers fresh fruits or vegetables during meals or snacks

Supporting Healthier Snack Foods and Beverages Sold or Offered in Schools

Foods or beverages sold outside of school meal programs meet specific nutrition requirements, or celebration rules for healthy foods and beverages during classroom celebrations

Multicomponent Interventions to Increase Availability of Healthier Foods and Beverages in Schools

School meals meet specific nutrition requirements or offer fresh fruits or vegetables during meals or snacks PLUS foods or beverages sold outside of school meal programs meet specific nutrition requirements, or celebration rules for healthy foods and beverages during classroom celebrations

Increasing Water Access in Schools

Provision and maintenance of hydration stations or allowing water bottles in class

Meal or Fruit and Vegetable Snack Interventions Combined with Physical Activity Interventions in Schools

School meals meet specific nutrition requirements or school offers fresh fruits or vegetables during meals or snacks PLUS increased time in physical education (PE) class dedicated to physical activity, opportunities for physical activity during the school day, or both

Supporting Healthier Snack Foods and Beverages Sold or Offered Combined with Physical Activity Interventions in Schools

Foods or beverages sold outside of school meal programs meet specific nutrition requirements, or celebration rules for healthy foods and beverages during classroom celebrations PLUS increased time in PE class dedicated to physical activity, opportunities for physical activity during the school day, or both

Multicomponent Interventions (Meal or Fruit and Vegetable Snack Interventions + Healthier Snack Foods and Beverages) Combined with a Physical Activity Intervention in Schools

School meals meet specific nutrition requirements or offer fruits or vegetables during meals or snacks PLUS foods or beverages sold outside of school meal programs meet specific nutrition requirements, or celebration rules for healthy foods and beverages during classroom celebrations PLUS increased time in PE class dedicated to physical activity OR policies or practices that allow opportunities for physical activity during the school day

Increasing Water Access Combined with Physical Activity Interventions in Schools

Provision and maintenance of hydration stations or allowing water bottles in class PLUS Increase time in PE class dedicated to physical activity, opportunities for physical activity during the school day, or both

References

Chriqui JF, Pickel M, Story M. Influence of school competitive food and beverage policies on obesity, consumption, and availability: a systematic review. *JAMA Pediatr* 2014;168(3): 279-86.

Lytle LA, Himes JH, Feldman H, Zive M, Dwyer J, et al. Nutrient intake over time in a multi-ethnic sample of youth. *Public Health Nutrition* 2002;5(2):219-328.

National Center for Education Statistics. 2007-08. Schools and Staffing Survey. Average number of hours in the school day and average number of days in the school year for public schools, by state: 2007-08. Retrieved from https://nces.ed.gov/surveys/sass/tables/sass0708_035_s1s.asp.

Sanchez-Vaznaugh EV, Sanchez BN, Crawford PB, Egerter S. Association between competitive foods and beverage policies in elementary schools and childhood overweight/obesity trends. *JAMA Pediatr* 2015;169(5):e150781.

United States Department of Agriculture (USDA). 2016. National School Lunch Program and School Breakfast Program: Nutrition Standards for All Foods Sold in School as Required by the Healthy, Hunger-Free Kids Act of 2010. Retrieved from <https://www.gpo.gov/fdsys/pkg/FR-2016-07-29/pdf/2016-17227.pdf>.

World Health Organization. Tackling Obesity by Creating Healthy Residential Environments. 2007. Edited by Schoeppe S and Braubach M.

Zarnowiecki DM, Dollman J, Parletta N. Associations between predictors of children's dietary intake and socioeconomic position: a systematic review of the literature. *Obesity Reviews* 2014;15:375-391.