

Healthy Weight Maintenance in Children: An Evidence Synopsis

This synopsis provides an overview of the development and validity of the Hunger Vital Sign (HVS), a screening tool that helps providers identify households with insufficient financial resources to purchase food, also known as food insecurity. Also included in this synopsis are summaries of selected studies and systematic reviews that evaluate the impact of food insecurity, sleep, sugar-sweetened beverages (SSBs) and screen media exposure on childhood obesity. Researchers are still studying the relationship between food insecurity and weight, and have not reached a scientific consensus. However, evidence generally supports an association between sleep, SSBs, screen media exposure and obesity. Finally, this document provides an overview of current dietary and physical activity guidelines for children.

Development and Validity of the Hunger Vital Sign

To help providers efficiently identify food-insecure households, researchers used the 18-item Household Food Security Survey (HFSS) to interview 30,098 low-income families with young children. They found that a two-item screen (the first two questions of the HFSS) had a sensitivity of 97 percent and specificity of 83 percent for identifying families of young children at risk for food insecurity. These two questions subsequently became the HVS screening tool.

If you screen for food insecurity, be sure to have a referral plan in place for patients that screen positive. Refer to the Help Pediatric Patients Maintain a Healthy Weight fact sheet for further guidance.

Hager ER, Quigg AM, Black MM, et al. Development and validity of a 2-item screen to identify families at risk for food insecurity. *Pediatrics*. 2010; 126(1):e26-e32. doi: [10.1542/peds.2009-3146](https://doi.org/10.1542/peds.2009-3146).

Diagnostic Accuracy of Food Insecurity Screening Tools

In this study, researchers conducted diagnostic accuracy studies comparing the six-item HFSS (gold standard), the two-item HVS and the two-item American Academy of Pediatrics (AAP) tool. The HVS demonstrated more sensitivity in identifying food insecurity, while the AAP tool

demonstrated higher specificity. The authors argue that a screening tool should optimize sensitivity because of the negative consequences of food insecurity and availability of services to address it. The HVS performed better than the AAP tool in identifying food-insecure households.

Makelarski JA, Abramsohn E, Benjamin JH, Du S, Lindau ST. Diagnostic accuracy of two food insecurity screeners recommended for use in health care settings. *American Journal of Public Health*. 2017; 107(11):1812-1817. doi: [10.2105/AJPH.2017.304033](https://doi.org/10.2105/AJPH.2017.304033).

The Relationship Between Food Insecurity and Obesity

This research brief summarizes the current strengths and limitations in the scientific literature about a potential association between food insecurity and obesity in children, adolescents and adults. The authors use existing data to propose conceptual models to explain this possible association. Conceptual models include limited resources and lack of access to healthy, affordable foods; cycles of food deprivation and overeating; high levels of stress, anxiety and depression; limited opportunities for physical activity; greater exposure to marketing of obesity-promoting products, such as sugary drinks and fast-food; and limited access to health care.

Hartline-Grafton H. Understanding the connections: food insecurity and obesity. 2015. Food Research & Action Center. http://frac.org/wp-content/uploads/frac_brief_understanding_the_connections.pdf. Accessed June 15, 2018.

The Relationship Between Sleep Duration and Childhood Obesity

This systematic review and meta-analysis investigated the relationship between sleep duration and childhood obesity. The review included 17 cohort and cross-sectional studies. Overall findings did not show a clear dose-response relationship between short sleep duration and overweight or obesity. However, children who had a much shorter sleep duration had a significantly higher risk of overweight or obesity. The association between shorter sleep duration and overweight or obesity was stronger in boys. For each one-hour increase in sleep duration, the pooled odds ratio suggested a small, significant inverse relationship between sleep and overweight or obesity.

Chen X, Beydoun MA, Wang Y. Is sleep duration associated with childhood obesity? A systematic review and meta-analysis. *Obesity*. 2012; 16(2):265-274. doi: [10.1038/oby.2007.63](https://doi.org/10.1038/oby.2007.63).

The Relationship Between Sugar-Sweetened Beverage Consumption and Weight Gain in Children

Summary estimates of the 15 child-focused cohort studies included in this systematic review found that an increase of one 12-ounce serving of sugar-sweetened beverages (SSBs) per day was associated with an increase in body mass index (BMI). Five randomized controlled trials (RCTs) found that reducing SSB consumption led to less BMI gain in pooled estimates. Sensitivity analyses of RCTs found that trials in which noncaloric beverages were substituted for SSBs resulted in significantly less BMI gain compared to educational interventions directed at preventing SSB consumption. Overall, findings offer evidence that SSB consumption is associated with weight gain in children.

Malik VS, Pan A, Willett WC, Hu FB. Sugar-sweetened beverages and weight gain in children and adults: a systematic review and meta-analysis. *American Journal of Clinical Nutrition*. 2013; 98:1084-102. doi: [10.3945/ajcn.113.058362](https://doi.org/10.3945/ajcn.113.058362).

Exposure to Screen Media and Obesity in Children and Adolescents

Researchers found a connection between obesity in children and adolescents and their exposure to screen media, specifically television viewing. Further research is needed to understand the impact of screen time from new media, including tablets and smartphones. Screen media exposure could lead to obesity through several mechanisms:

- Displacing physical activity, though existing research has not provided strong support for this hypothesis

- Eating while viewing, which can lead to overeating
- Exposing children to food advertising and marketing, which can influence their food preferences
- Reducing sleep

Robinson TN, Banda JA, Hale L, et al. Screen media exposure and obesity in children and adolescents. *Pediatrics*. 2017; 140(s2):s97-s101. doi: [10.1542/peds.2016-1758K](https://doi.org/10.1542/peds.2016-1758K).

Physical Activity Guidelines for Children and Adolescents

The second edition of the Physical Activity Guidelines for Americans was released in late 2018. The guidelines provide information and guidance on the types and amounts of physical activity necessary to improve health outcomes among various populations in the United States. The guidelines recommend that preschool age children (ages 3 to 5) be physically active throughout the day to enhance growth and development. Children and adolescents (ages 6 to 17) should engage in 60 minutes or more of moderate-to-vigorous physical activity daily, including muscle-strengthening and bone-strengthening exercises at least three days a week.

Piercy KL, Troiano RP, Ballard RM, et al. The Physical Activity Guidelines for Americans. *JAMA*. 2018;320(19):2020-2028. doi: [10.1001/jama.2018.14854](https://doi.org/10.1001/jama.2018.14854)

Dietary Guidelines for Children and Adults

The U.S. Departments of Agriculture and Health and Human Services released updated dietary guidelines in 2015. Written for a professional audience, the guidelines provide direction for helping all individuals ages 2 and older consume a nutritious diet. Rather than prescribing individual dietary components, the guidelines recommend broad eating patterns that promote health and prevent chronic disease. The dietary guidelines are:

- 1) Follow a healthy eating pattern across the lifespan.
- 2) Focus on variety, nutrient density and amount.
- 3) Limit calories from added sugars and saturated fats and reduce sodium intake.
- 4) Shift to healthier food and beverage choices.
- 5) Support healthy eating patterns for all.

U.S. Department of Health and Human Services and U.S. Department of Agriculture. *Dietary Guidelines for Americans 2015-2020*. Eighth Edition. 2015. <https://health.gov/dietaryguidelines/2015/guidelines>. Accessed June 15, 2018.