

Cochrane for Clinicians

Putting Evidence into Practice

Interventions for Increasing Fruit and Vegetable Consumption in Children Five Years and Younger

Matthew Rensberry, MD, Florida Hospital Family Medicine Residency Program, Orlando, Florida

Author disclosure: No relevant financial affiliations.

Clinical Question

How effective are interventions to increase consumption of fruits and vegetables in children five years and younger?

Evidence-Based Answer

Child feeding interventions are effective in the short term (i.e., less than 12 months) for increasing a child's intake of fruits and vegetables, but only by less than 5% of the recommended daily allowance. Conversely, parental nutrition education and multicomponent interventions, such as combining preschool policy with parental education, are not effective.¹ (Strength of Recommendation: C, based on consensus, disease-oriented evidence, usual practice, expert opinion, or case series.)

Practice Pointers

Lower-than-recommended fruit and vegetable consumption is associated with multiple chronic disease processes.^{2,3} In the United States, 24% of young children do not meet daily recommendations for fruit intake and 85% do not meet daily recommendations for vegetable intake (i.e., three to four servings for each).⁴ Interventions that encourage healthy childhood dietary habits might lead to continued healthy choices as adults, potentially reducing the risk of associated chronic diseases.

These are summaries of reviews from the Cochrane Library.

This series is coordinated by Corey D. Fogleman, MD, Assistant Medical Editor.

A collection of Cochrane for Clinicians published in *AFP* is available at <https://www.aafp.org/afp/cochrane>.

CME This clinical content conforms to AAFP criteria for continuing medical education (CME). See CME Quiz on page 417.

This Cochrane review included 55 trials and 11,108 participants.¹ The authors evaluated four strategies with 33 trials examining child feeding interventions, 13 trials examining parental nutrition education, eight examining multicomponent interventions, and one that looked at child nutrition education. Child feeding interventions included repeated exposures, offering a choice of vegetables vs. the adult selection, pairing of foods with positive stimuli, and providing flavor interventions such as vegetables served with liked familiar foods or salted vs. unsalted vegetables. Parental nutrition education was delivered in both health care and home settings, from dietitians and using print or interactive materials. Multicomponent interventions included preschool policy changes, garden-based interventions, or teacher and parent curriculum development. The child nutrition education study looked at the effects of nutrition education delivered in preschool classrooms. Most of the studies were conducted in the United States (24 trials) and western Europe (23 trials).

The child feeding interventions demonstrated an increase in vegetable consumption in the short term (i.e., less than 12 months; mean difference [MD] = 4.03 g; 95% confidence interval [CI], 0.15 to 0.61). Interventions that were not effective included parental education (MD = 0.11 servings per day; 95% CI, -0.05 to 0.28), multicomponent interventions (MD = 0.29 cups of vegetables per day; 95% CI, -0.06 to 0.63), and child nutrition education (based on a single study that did not include an analysis).

This review suggests that interventions to increase fruit and vegetable consumption in children are only marginally effective based on very-low-quality evidence. Although one-third of the studies demonstrated effectiveness with specific child feeding practices, when evaluated collectively, the findings were equivocal. The evidence was insufficient to evaluate long-term effectiveness, cost-effectiveness, and adverse consequences of these interventions.

According to the U.S. Department of Agriculture, the recommended daily allowance for children is three to four servings of fruits and vegetables per day; serving sizes vary widely (e.g., one serving of broccoli is approximately 30 g, whereas

one serving of mixed fruit is 175 g). Child feeding interventions have a small effect size (MD = increase of 4.03 g) supported by very-low-quality evidence. However, this increase in consumption is clinically insignificant because it is less than 5% of the daily recommended consumption of fruits and vegetables for this population.⁵

The practice recommendations in this activity are available at <http://www.cochrane.org/CD008552>.

References

1. Hodder RK, Stacey FG, O'Brien KM, et al. Interventions for increasing fruit and vegetable consumption in children aged five years and under. *Cochrane Database Syst Rev*. 2018;(1):CD008552.

2. World Health Organization. *Diet, Nutrition and the Prevention of Chronic Diseases*. WHO Technical Report Series no. 916. Geneva, Switzerland: WHO; 2003. http://apps.who.int/iris/bitstream/handle/10665/42665/WHO_TRS_916.pdf. Accessed April 10, 2018.

3. Liu RH. Health-promoting components of fruits and vegetables in the diet. *Adv Nutr*. 2013;4(3):384S-392S.

4. Usual dietary intakes: food intakes, U.S. population, 2007-10. Epidemiology and Genomics Research Program. National Cancer Institute. Updated May 20, 2015. <http://epi.grants.cancer.gov/diet/usualintakes/pop/2007-10/>. Accessed April 2, 2018.

5. U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans, 2010*. 7th ed. Washington, DC: U.S. Government Printing Office; December 2010. <https://health.gov/dietaryguidelines/dga2010/DietaryGuidelines2010.pdf>. Accessed April 10, 2018. ■



Stay ahead of the curve. Subscribe to *Annals of Family Medicine*.

Sign up for a year's print subscription for only \$65*.

Get the latest peer-reviewed, clinical articles for family medicine delivered to your home or practice. *Annals of Family Medicine* is a bimonthly journal that features:

- Original research, methodology, and theory.
- Important topics relevant to family medicine.
- Special reports from organizations and policymakers.

Stay up to date on health care trends and research, expand your knowledge, and be a pacesetter for your practice.

*Supporting organization member rate only \$65. Regular physician rate \$155.

Subscribe to *Annals of Family Medicine* today.
annfam.org/site/subscriptions



JRM17030613