

SEED

Study to Explore Early Development

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What have we learned from SEED so far?

This edition of the Study to Explore Early Development (SEED) Newsletter highlights some research findings that may interest you. SEED has helped us learn about children with autism and other developmental disabilities. You may have participated in SEED 1 (2007–2011), SEED 2 (2012–2016), SEED 3 (2017–2020), SEED Teen (2018–2021), the COVID-19 Impact Assessment (2021), or most recently, SEED Follow-Up (2022–2026). Each phase of SEED has given us a lot of information that will help us understand the needs of communities and families.

In this issue, we will share some of what we learned about the use of complementary and alternative medicine and the diets of SEED participants.

Factors associated with the use of complementary and alternative medicine among children with autism

Complementary and alternative medicines (CAM) are treatment approaches that are not usually part of ordinary medical care. This study explored the reasons why some children with autism receive these additional CAM treatments, alongside standard medical care.

We learned that:

- Common CAM approaches included specialized diets, such as eliminating gluten or dairy, and the use of nutritional supplements.
- Children who frequently visited their healthcare providers and who experienced more emotional or behavioral difficulties were more likely to use CAM therapies.

The research showed that CAM is generally used in addition to conventional treatment, rather than as a substitute. These findings can support healthcare providers and families in creating more comprehensive care plans.

Nutritional adequacy of young children

Many people have concerns about the diets of children with developmental disabilities. In SEED 1, we examined the eating habits of three groups: children with autism, children with other developmental delays, and children from the general population. The goal was to compare dietary intake (the quality and quantity of nutrients consumed daily) in each group and identify any differences in order to help us to better understand their overall health and growth.

We learned that:

- Young children, including those with autism and other developmental delays, get enough nutrients from food to meet most recommendations.
- All three groups of children ate too much added sugar.
- Children with autism ate less protein but still met the recommended amount for their age group.
- Most children did not get the recommended amount of fiber.
- None of the groups met the guidelines for vitamin D.
- Many children were low in calcium, potassium, and vitamin A, while some had too much sodium and niacin in their diets.





Nutritional Adequacy of Young Children (cont.)

Overall, children's diets appear good enough to support growth and health. However, nutrient intake does not always show how healthy a diet is. There is room to improve the quality of diets.

The SEED study found that most children in the sample met recommended intake levels for many nutrients. However, over half of the children across all three groups consumed insufficient amounts of fiber, calcium, and vitamin D based on USDA recommendations. These findings are significant as they come from a large, well-characterized sample of U.S. children (with autism, with other developmental delays, and from the general population), providing important insights into how nutrition may vary across developmental groups.

Although most children met the general guidelines for protein, carbohydrates, and fats, this study did not evaluate the quality of the food or dietary patterns, which can often differ in children with autism and other developmental disabilities. It's also important to note that the study only included younger children, not preteens or teens, whose nutritional needs are higher due to rapid growth.

FIBER INTAKE

Less than 2% of children met the recommended intake for fiber. Fiber plays several critical roles—it supports healthy digestion, feeds beneficial gut bacteria, may lower the risk of heart disease, and can aid in weight management. Given the low fiber consumption, caregivers might consider adding fiber-rich foods and potentially supplementing with fiber or fiber-containing oral nutritional shakes.

When increasing fiber, do so gradually to avoid gastrointestinal issues like bloating, cramping, gas, diarrhea, or constipation. Since fiber absorbs water, it's important to boost fluid intake when increasing fiber intake. A helpful visual: just as oats swell when soaked in water, fiber-rich foods expand in the body, therefore hydration supports this process.

Food Sources: Brown rice, oatmeal, fortified cereals, whole wheat products, popcorn, tortillas, fresh fruits and vegetables, beans, lentils, nuts, seeds

Typical Serving: 1 oz grains, ½ cup cooked beans, 1 cup vegetables/fruit, 1 oz nuts/seeds, 3 cups popcorn

USDA Recommendation: >2 years: 14g per 1000 calories

CALCIUM INTAKE

More than half of the children consumed less calcium than recommended. Calcium is essential not only for building strong bones but also for muscle function, nerve transmission, hormone release, and blood vessel regulation. To address low intake, families should focus on including calcium-rich foods in daily meals and snacks. While increasing calcium rich foods, one may consider a calcium and vitamin D supplement.

Food Sources: Milk, fortified plant-based milks, yogurt, kale, fortified breads/juices, tofu, spinach, broccoli

Typical Serving: 1 cup (8 oz)

USDA Recommendation: 4–8 yrs: 1,000 mg/day (2–3 servings), 9–18 yrs: 1,300 mg/day (4 servings)

VITAMIN D INTAKE

Over 90% of all children in the study did not meet the recommended intake for vitamin D. This nutrient is vital for bone health, immune support, and reducing inflammation.

Food Sources: Fortified milk and juices, egg yolks, fortified cereals, yogurt, seafood (salmon, tuna), cod liver oil

Typical Serving: 3 oz seafood, 1 cup milk/juice/yogurt, 1 tbsp cod liver oil

USDA Recommendation: 1–50 years: 600 IU/day

SUGAR INTAKE

The American Academy of Pediatrics recommends that children between the ages of 2-18 limit sugar intake to 25 grams (approximately 6 teaspoons) per day. This can be difficult to achieve, especially if your children are consuming sodas, juice, and sport drinks. These beverages often have more than 6 teaspoons of sugar so parents may want to consider offering them less often and diluting juice. If a child enjoys yogurt a healthy option is to add fresh fruit and a teaspoon of honey to a plain yogurt instead of buying flavored yogurts. Another way to limit sugar intake is to prepare and serve whole grains when it comes to breads, pastas and rice. Remember, it's normal for kids to have some sugar, but moderation is important, and it's good to limit it when possible.

FOOD SELECTIVITY IN CHILDREN WITH DEVELOPMENTAL DISABILITIES



Food selectivity (aka “picky eating”) is more common in children with autism and other developmental delays than in typically developing peers. Food selectivity has many factors, influenced by a child’s temperament, medical history, developmental skills, environment, parenting style, access to food, and genetics. Food selectivity is characterized as a diet that lacks a variety of food items and often includes strong preferences for certain textures, colors, brands, or specific preparation methods.

Registered Dietitian Nutritionist Dr. Nikki Withrow, PhD, MS, RDN, at the University of Northern Colorado, recommends the following tips to encourage a variety of foods and increase intake of nutrients:

1. Offer small, bite-sized portions of new foods to reduce resistance.
2. Encourage your child to interact with new foods—touch, smell, lick, and taste.
3. Pair unfamiliar foods with familiar favorites.
4. Maintain consistent meal and snack times.
5. Repeatedly offer new foods—research suggests it can take over 25 exposures to new foods.
6. Focus on small wins.
7. Follow the division of responsibility: parents choose the food; the child chooses whether and how much to eat.
8. Parents might consider offering a nutritional supplement between meals, so it doesn't replace food.
9. Provide a lot of positive reinforcement during meals and snacks while child is exploring a new food.
10. Offer choices of foods.
11. Create a positive and low-pressure environment.