USDA Food and Nutrition Service
U.S. DEPARTMENT OF AGRICULTURE

Research Summary October 2021

Indicators of Diet Quality, Nutrition, and Health for Americans by Program Participation Status, 2011–2016: Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Report (Summary)

Background

The Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA) administers 15 nutrition assistance programs that seek to increase food security through access to a healthy diet. The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides Federal grants to States for supplemental foods, health care referrals, and nutrition education for low-income pregnant, breastfeeding and non-breastfeeding postpartum women, and to infants and children up to age five who are found to be at nutritional risk.

This study primarily uses 2011–2016 National Health and Nutrition Examination Survey (NHANES) data to examine bivariate relationships between reported WIC participation and outcomes including diet quality, indicators of nutrition and health, food consumption patterns, and nutrient intakes among 1- to 4-year-old children. Most results presented in this report are unadjusted and descriptive only, and do not infer causality. They are intended to contribute to the evidence base needed to inform future research and, subsequently, WIC policy and practice.

Key Findings

- WIC participants consume fewer calories from added sugars and saturated fats than nonparticipants.
- Anemia, an indicator of iron status, is similar across participating and nonparticipating children.
- Both WIC-participating and non-participating children may have inadequate dietary intakes of calcium, vitamin D, and vitamin E.

Methods

The study used NHANES data from three cycles (2011–2012, 2013–2014, and 2015–2016). NHANES is designed to assess the health and nutritional status of adults and children in the United States. The survey examines about 5,000 individuals each year, and data are weighted to produce national estimates. NHANES data are collected via interviews, physical examinations, and laboratory tests.

The current study's sample leveraged NHANES data on children ages 1 to 4 years. Children were categorized as WIC participants if their caregiver reported the child was currently participating in the program. Those children whose caregivers reported that they did not currently participate in WIC were categorized as either income-eligible nonparticipants or higher income nonparticipants, depending on their household income and whether they received benefits from the Supplemental Nutrition Assistance Program (SNAP) or Medicaid.

In the main report, unadjusted, descriptive analyses were used to examine associations between WIC participation status and the following diet and health measures:

- Diet quality: For children ages 2 to 4 years, diet quality on a given day was examined using the Healthy Eating Index (HEI)-2015, a score which assesses adherence to the 2015–2020 Dietary Guidelines for Americans (DGAs).
- Food consumption patterns: For children ages 1 to 4 years, food consumption patterns were examined by estimating (1) the proportion of individuals consuming any foods from various supermarket aisle food groups and subgroups on a given day and (2) the average amounts consumed.
- Weight, hemoglobin, and vitamin D status: Anthropometric data were used to examine body mass index for age (BMI-for-age) for children ages 2 to 4 years. Biochemical data were used to assess anemia (i.e., hemoglobin <110 g/L) and low vitamin D status (i.e., serum 25-hydroxyvitamin D <50 nmol/L) for children ages 1 to 4 years.
- Usual nutrient intake: Twenty-four-hour dietary recall data were used to assess the total energy,

macronutrient, and micronutrient intakes of children ages 1 to 4 years.

For select outcomes, analyses were adjusted for co-variates including, but not limited to, age, race/ethnicity, education and marital status for household reference person; household income-to-poverty ratio; household size; and household food security status. These analyses are noted as such and are available in Appendix I.

When interpreting findings, it is important to consider the supplemental nature of WIC. The program is not intended to provide all of the participant's daily food requirements. There are many factors associated with dietary intake and health outcomes, and WIC program participation is only one of these factors. Because of the descriptive nature of most analyses, the results presented in this report cannot be used to assess the impact of WIC or infer causality.

Findings

Among children ages 2 to 4 years old, WIC participants had a higher, unadjusted diet quality score than income-eligible nonparticipants (62 versus 59 points) on a given day. After adjustment for other factors, there was no significant difference between the total HEI-2015 score of WIC participants and nonparticipants; however, WIC participants did score better on the fatty acids component and the added sugar component scores. Of note, all groups (i.e., WIC participants and nonparticipants) had low mean HEI-2015 scores, suggesting that, on average, young children fall short of meeting DGA recommendations.

Differences in population characteristics may partially explain differences in children's weight status by participation categories. Among all children ages 2 to 4 years, 74 percent had a healthy weight status, 14 percent were overweight, and 9 percent were obese. In unadjusted analyses, WIC participants had a higher prevalence of obesity, but not overweight, compared to income-eligible and higher income nonparticipants. However, this difference may be partially explained by differences in population characteristics among the groups. After adjusting for covariates, the combined prevalence of overweight and obesity was similar for WIC participants and income-eligible nonparticipants. Future research should explore this topic by examining how timing and duration of WIC participation influences weight status, and whether changes in weight status of individual children over time are associated with WIC participation.

The prevalence of anemia is similar across participating and nonparticipating children. Among all children ages 1 to 4 years, 96 percent had normal hemoglobin concentrations, and unadjusted results were similar across participant groups. After adjustment for covariates, anemia prevalence and mean hemoglobin concentrations were similar for WIC participants and income-eligible nonparticipants and higher income nonparticipants. Of note, a higher percentage of WIC participants reported treatment for anemia in the previous 3 months compared to nonparticipants.

The vitamin D status of most young WIC participants is adequate, although dietary intake of vitamin D needs improvement. Among all children ages 1 to 4 years, most (93 percent) had serum vitamin D concentrations considered adequate for bone health; however, only 14 percent consumed adequate amounts of vitamin D in their usual diet. When examining serum vitamin D concentrations by WIC participation status, unadjusted results were similar across participant groups. Similarly, when assessing prevalence of adequate usual intake of vitamin D, results did not vary by participation status.

WIC participants consume fewer calories from added sugars and saturated fats than nonparticipants. In both adjusted and unadjusted analyses, usual daily energy intake among 2- to 4-year-old WIC participants was similar to those of income-eligible nonparticipants and higher income nonparticipants. After adjusting for covariates, WIC participants had lower, mean absolute intakes of calories from added sugars and saturated fat than income-eligible nonparticipants.

Some WIC participants do not consume adequate amounts of calcium and vitamin E. While nearly all (99 to 100 percent) children ages 1 to 4 years had adequate usual intakes of vitamin A, vitamin B6, vitamin B12, vitamin C, copper, folate, iron, magnesium, niacin, phosphorous, riboflavin, selenium, thiamin, and zinc, 89 percent of children had adequate usual intakes of calcium and 43 percent had adequate usual intakes of vitamin E. Among WIC participants specifically, 86 percent had adequate calcium intake and 36 percent had adequate vitamin E intake. Sodium intakes were high for both WIC participants and nonparticipants.

For More Information:
Gleason, S., Hansen, D., Wakar, B. (2021). Indicators of Diet Quality, Nutrition, and Health for Americans by Program Participation Status: WIC Report. Prepared by Insight Policy Research, Contract No. GS-10F-0136X. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Office of Policy Support, Project Officer: Michael Burke. Available online at: www.fns.usda.gov/research-and-analysis.