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Safety Net Programs Associated With Improved Diet and Weight Among Disadvantaged Children

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Programs such as Medicaid, the Supplemental Nutrition Assistance Program (SNAP), and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provide access to vital medical and nutrition services. In a recent study, we investigated whether demographic, social, and economic determinants of health, including length of time spent on these programs, were associated with diet quality and weight status in early childhood. To do so, we used a study of WIC infant and toddler feeding practices in conjunction with the Healthy Eating Index-2020 (HEI-2020), its subscales, and Body Mass Index z-scores (BMIz) at age two to five years. We also considered aspects like maternal BMI, child birthweight, sociodemographic status, and duration of program participation. We found that race and ethnicity, longer WIC and shorter SNAP durations were the primary predictors of higher HEI-2020 scores. Higher HEI adequacy was primarily predicted by higher education, older maternal age, longer WIC duration, and race and ethnicity. Higher HEI moderation was primarily predicted by race and ethnicity and longer WIC duration. Higher birth weight was the primary predictor of higher BMI. For policymakers, these findings can help inform tailored recommendations—such as staying on the WIC program for longer—for improving diet quality and weight status among socioeconomically disadvantaged young children.

Key Facts

Federal assistance programs like WIC and SNAP are designed to alleviate the impact of socioeconomic disparities in nutrition during childhood, which can contribute to poor diet quality and weight status.

The strongest predictors of diet quality were program duration (especially WIC) and race and ethnicity.

Encouraging longer participation in federal nutrition assistance programs, especially for Black and English-speaking Hispanic households, will likely help to improve diet quality and weight status among children with lower socioeconomic status.

Background

Socioeconomic disparities in nutrition during childhood can contribute to poor diet quality and weight status.[1,2,3] Compared to households with higher socioeconomic status (SES), those with lower SES are more likely to have higher food insecurity and unhealthier food habits, and to more infrequently meet national dietary guidelines—differences which can impact overall health.[4,5] Social safety net programs such as Medicaid, SNAP and WIC aim to offset these disparities.

Medicaid insures close to 39 million children,[6] while SNAP provides approximately 42 million people with an electronic benefit transfer card they can use to purchase eligible foods. Serving more than six million pregnant and postpartum females and children aged five and under per year, WIC provides participating individuals a prescribed nutritious food package, nutrition education, and referrals to health and social services.[7]

Prior research shows that participants who stay on SNAP tend to be more food insecure and have poorer diet quality than income-eligible nonparticipants.[8] In contrast, WIC participants tend to have better diet quality the longer they stay on the program. This is potentially due to the healthy food packages combined with nutrition education.[9]

In our study,[10] we aimed to identify the demographic, social, and economic factors—including time spent in specific safety net programs—that differentiate children from low-income households with higher diet quality and weight status from those with lower diet quality and weight status.

Exploring what predicts children's diet quality and weight status

We used machine learning techniques classification and regression tree analysis to explore a range of data, including that collected via the WIC Infant and Toddler Feeding Practices Study-2 (WIC ITFPS-2). This was a nationally representative, longitudinal study of caregivers and their children followed from around birth up to age nine. During regular interviews throughout their children's first five years, WIC ITFPS-2 participants were asked about breastfeeding and other feeding practices, and about their child's food consumption over the preceding 24 hours.

Sociodemographic data were also collected from participating mothers. These included maternal age at child's birth, maternal race and ethnicity, language preference, maternal BMI, gestational diabetes, maternal depression score at the 3-mo visit, and household size. Data collected included maternal BMI, marital status, household size, household income, household food security, and maternal employment status.

We also used HEI-2020 scores (revised to reflect the

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2020–2025 Dietary Guidelines for Americans), as well as the HEI-2020 adequacy subscale (covering consumption of healthy foods like fruits, vegetables, and whole grains) and the HEI-2020 moderation subscale (covering refined grains, sodium, added sugars, and saturated fats). BMIz scores were calculated at two to five years using the Centers for Disease Control and Prevention age and sex-specific growth charts.

Program duration and race and ethnicity are dominant predictors

We found that most caregivers were 20–25 years old, Hispanic, English-speaking, and had at least a high-school education. The average HEI-2020 score ranged from 56.0–57.6 between ages two and five. Mean child BMIz declined slightly from 0.69 at age two to 0.61 at age five. Most families received WIC benefits at age two, but participation declined by age five. SNAP participation was more inconsistent, and Medicaid coverage was generally consistent across years.

> *"People will have healthier lifestyles with being on the WIC program just because, you know, when we start feeding our babies along with, you know, ...like having our appointments. Oftentimes we do like the educational piece."*

> *"Having that educational piece alongside with the appointments has been helpful for our family, because it kind of helps me to know like what other foods I can introduce to my baby, and also to my toddler."*

Quotes from focus-group participants discussing their experiences of WIC

Race and ethnicity were the strongest predictors of total HEI-2020 scores at ages two, three, and five. At age three, additional predictors included WIC/SNAP duration, maternal education, and income. At age four, WIC duration was the main predictor, followed by SNAP and race/ethnicity. Consistent WIC participation and Hispanic/Spanish-speaking background were linked to higher total HEI and HEI adequacy scores.

For HEI adequacy, maternal education, race/ethnicity, and WIC duration were key predictors at age two; maternal age and WIC duration at age three; and WIC duration, SNAP duration, and race/ethnicity at age four. By age five, race/ethnicity, SNAP duration, and maternal BMI were most important. HEI moderation was consistently predicted first by race/ethnicity, then by WIC duration, and finally by SNAP duration at ages two and three.

Birth weight was the strongest predictor of BMIz from ages two–five, followed by maternal BMI, child sex, and SNAP participation. Sporadic SNAP participation was associated with lower BMIz, while consistent or no SNAP use correlated with higher BMIz.

Encourage longer participation in nutrition assistance programs to improve diet quality and weight status

Child diet quality and weight status were associated with several social determinants of health and often occurred at the intersection of multiple predictors, which included maternal BMI, race and ethnicity, and duration of participation in food assistance programs, particularly WIC. Along with race and ethnicity, WIC and SNAP duration were the dominant predictors of total HEI-2020 scores. Race and ethnicity and longer WIC duration were the primary predictors of higher adherence scores on the HEI subscale for moderation, which reflects how much a person adheres to the Dietary Guidelines for Americans. Our findings support the previously documented association between lower SES and poorer diet quality, with a growing trend observed among Black children.

Long-term WIC participation may be particularly important in improving diet quality for some racial and ethnic groups. By providing a nutritious food package, WIC may potentially reduce the intake of nutrients of concern, such as added sugar and sodium, while promoting the consumption of healthy food groups, such as fruits and whole grains, as highlighted in the Dietary Guidelines for Americans. Although individuals participating in two or more safety net programs are more likely to be food insecure, have lower incomes, and experience economic hardships, consistent joint participation in WIC may improve the diet quality of SNAP participants.[11]

For policymakers, these findings can help inform tailored recommendations—such as staying on the WIC program for longer—for improving diet quality and weight status among socioeconomically disadvantaged young children.

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> "Consistent joint participation in WIC may improve the diet quality of SNAP participants."

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