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RECENT NEWS ON THE SPECIAL SUPPLEMENTAL NUTRITION PROGRAM FOR WOMEN, INFANTS AND CHILDREN (WIC)

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) has been providing healthy food, breastfeeding support, referrals to health and social services, and nutrition education to income qualified families in the USA with nutritional needs for over 40 years. Administered by the United States Department of Agriculture (USDA), WIC serves around 7 million low-income women, infants, and children aged between 1 and 5 years old. WIC is the nation's premier public health nutrition program.

WIC's food package is a cornerstone of the program. The foods prescribed are individually tailored to the nutritional needs of the participant and support healthy growth and development. The WIC food package includes items such as milk, cheese, yoghurt, peanut butter, legumes, canned fish and whole grains. WIC participants receive their healthy food prescription on either an electronic benefit card or paper voucher along with a cash value voucher (CVV) that can be spent exclusively on fruit and vegetables.

WIC's food package is reviewed at least every 10 years as mandated by the Healthy Hunger Free Kids Act (2010) to ensure it's based on the most current scientific evidence, aligns with the Dietary Guidelines for Americans, and is culturally appropriate to the families WIC serves. In January 2017, the National Academies of Sciences, Engineering and Medicine (NASEM) published a ten-year review of the WIC food package and recommended changes to enhance balance and choice for WIC participants. A key feature of the recommendations is increasing the amount of vegetables and fruit that families can access through WIC.

As the non-profit education arm and advocacy voice of the WIC program, both mothers and young children served by WIC, and the 12,000 service provider Agencies who are the front lines of WIC's public health nutrition services, National WIC Association (NWA) works to assure and support policies that mandate a healthy, culturally sensitive food package. One way NWA accomplishes this is through effecting legislative policies adopted during the Child Nutrition Reauthorization (CNR) legislative process. NWA's current key CNR priorities include, among other, the implementation of pilot projects that enhance the CVV by increasing the CVV value and permitting substitutions of other food package items – including juice and jarred fruit and vegetables – with additional CVV benefit.

As well as recommending changes to the food package, NASEM also offered recommendations for future research. Methodologically rigorous qualitative and quantitative research studies are essential to document WIC's impact and identify areas for improvement. It is imperative that researchers continue to conduct independent studies analyzing various aspects of the program, particularly as it relates to the value, shape, form, and content of the food package. Without qualitative research, WIC's continued successes cannot be assured.

We are pleased to share with you three articles that further demonstrate the importance of research as a tool to continuously reflect on how WIC participants utilize their WIC food benefits.

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Relationships between stress, demographics and dietary intake behaviours among low-income pregnant women who are overweight or obese

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In the US, nearly 45% of low-income pregnant women are overweight or obese prior to pregnancy[1]. About 65-85% of overweight or obese women, especially those who are low-income, experience excessive gestational weight gain, which is associated with less healthy eating[2] and adverse maternal and birth outcomes, for example, gestational diabetes[3], and a large baby[4,5].

This study identified demographic risk factors associated with high stress and examined the relationship between levels of stress, demographics, and dietary intake of fat, fruit and vegetables in low-income overweight or obese pregnant women. Participants were recruited from WIC program. 353 low-income overweight or obese pregnant women who were non-Hispanic Black (Black) or White (White) filled out a pencil-and-paper survey that asked for demographic information, stress and dietary intake of fat, fruit and vegetables.

Prevalence of high stress and demographic risk factors

47% of pregnant women reported high levels of stress.

Women who were 35 years old or older, had a high school or less education, or were unemployed were at risk for high stress (Figure 1).

Relationship between levels of stress, demographics and dietary fat, fruit and vegetable intake

- **Level of stress** was not associated with fat intake. However, as stress increased women were less likely to eat fruit and vegetables.
- **Age** was not associated with fat and fruit intake. Yet, women who were 35 years or older were more likely to report eating more vegetables than women who were 24 years or younger.
- **Race/ethnicity :** compared to Black women, White women were more likely to report eating less fat and vegetables. Race was not associated with fruit intake.
- **Education** was not associated with fat, fruit and vegetable intake.
- **Employment status** was not associated with fat, fruit and vegetable intake.
- **Smoking status :** women who never smoked reported less fat intake than women who smoked or quit smoking. Smoking status was not associated with fruit and vegetable intake.

Conclusion

- Stress is likely to be higher in low-income overweight or obese pregnant women who were older, less educated, and unemployed.
- Level of stress, age, race/ethnicity and smoking status were associated with fat, fruit, and vegetable intake.
- Health care providers may consider identifying subgroups of women who are at risk for less healthy eating to provide additional nutrition counselling.

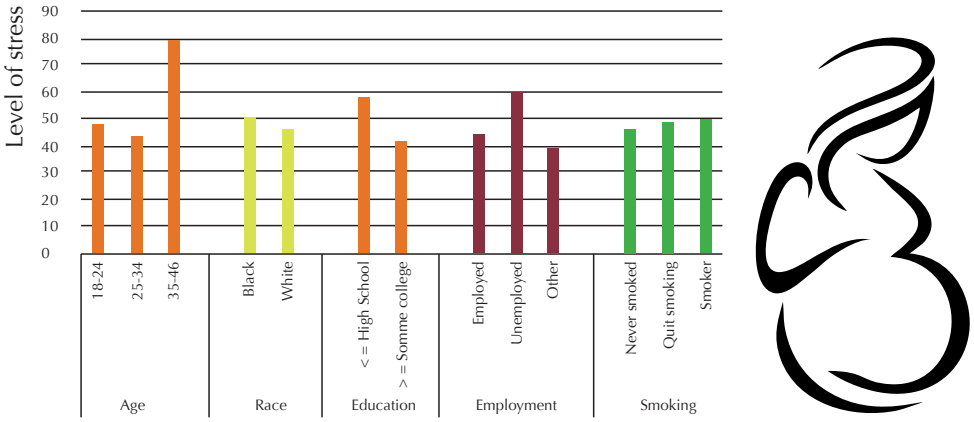

Figure 1: Prevalence of high stress and demographic risk factors

Based on: Chang M, Tan A, Schaffir J. Relationships between stress, demographics and dietary intake behaviours among low-income pregnant women with overweight or obesity. Public Health Nutrition. 2019;22(6):1066-1074.

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Tackling sugar-sweetened beverage consumption in the first 1,000 days: Interviews with WIC families and providers

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In the United States, childhood obesity prevalence persists at historically high levels. Racial and socioeconomic disparities in childhood obesity are rooted in the first 1,000 days of life, from pregnancy through to 2 years of age[1]. Consumption of sugar-sweetened beverages (SSBs) is a major risk factor for obesity throughout the life course, including during pregnancy and infancy[2,3]. Our aim is to examine perceptions of SSB consumption and acceptability of potential interventions to promote SSB avoidance among low-income families in the first 1000 days.

In this qualitative research, we performed 25 semi-structured interviews of pregnant women and mothers of infants enrolled in WIC, and 7 interviews of WIC providers and physicians. Each participant completed a 90-minute in-depth interview in English (n=17) or Spanish (n=15). Participants viewed and discussed up to 24 visual aids. We examined perceptions, barriers, and facilitators related to avoidance of SSB consumption and perceived efficacy of various interventions.

Parents are confused about healthy vs. unhealthy beverages

Almost all mothers were confused about what beverages were healthy for themselves and their children. They used brand and packaging to determine what drinks were sugary, but no parents indicated using nutrition facts to assess sugar content.

Parents feel they lack control over beverage choices

Most mothers believed that pregnancy cravings and taste preferences were so strong and were impossible to overcome. Mothers also believed that children controlled their own beverage consumption and that SSBs were impossible to avoid in childhood. Mothers and providers perceived that families want healthy alternatives to water.

Images of negative health consequences are strong motivators to decrease SSB consumption

Messages promoting the health benefits of water were well received by mothers and providers, however messages focusing on negative health consequences of SSBs drew stronger responses. Mothers unanimously agreed that messages focused on negative health consequences for children would convince parents to stop giving their children SSBs. In contrast, providers did not believe negative health consequences were an effective message frame, either because they thought young families would not relate or that negative messages are discouraging.

Concrete illustrations of sugar content empower parents and shift attitudes against SSBs

Messages with sugar content information of different beverages surprised pregnant women and mothers, especially drinks they considered "healthy" like sports and fruit drinks. Many mothers liked that they could make their own informed choices by comparing sugar content of different drinks. Providers noted that visual aids of the amount of sugar in different drinks were successful in their own practices.

Themes	Illustrative Quotes
Confusion about healthy vs. unhealthy beverages	"Healthy? Organic apple juice…one percent milk is healthy, it's fat free… I also drink a chocolate drink, but it's organic."
Lack control over beverage choices	"When I was pregnant, I barely drank water. It was more because I was always craving sweets."
Strongly motivated by images of negative health consequences	"Brain stroke, heart attack… oh God. That's scary… I would want them drinking water all the time, forget the sugary drink… it scares me more for my kids."
Empowered by sugar content information	"You could tell somebody 'oh you're drinking all of this sugar,' but like actually seeing the spoons of sugar… it's a lot."

Messages focused on infant health consequences and parental empowerment to evaluate and select healthier beverages based on sugar content should be tested in interventions to reduce SSB consumption in the first 1000 days.

Based on: Morel K., et al. Parental and Provider Perceptions of Sugar-Sweetened Beverage Interventions in the First 1,000 Days: A Qualitative Study. Acad Pediatr. 2019; 19(7): 748-755.

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WIC participation and a healthier food environment are associated with objectively assessed fruit and vegetable consumption

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Accessibility to healthy food, primarily measured using distance to food outlets such as supermarkets (SM) may influence population-level dietary behaviors[1]. However, previous research examining the association between access to supermarkets and dietary quality appears mixed[2]. These mixed findings could be due to error inherent in self-reported measures of dietary consumption[3].

Thus, the purpose of this study is to examine the:

- association between accessibility to the supermarket where participants were surveyed,
- frequency of shopping at the supermarket, and
- self-reported and objectively assessed fruit and vegetable (F&V) consumption.

Accessibility was assessed using Geographic Information Systems (GIS) measured distance and multiple versions of the modified Retail Food Environment Index (mRFEI). The mRFEI includes a ratio of healthy food outlets (supermarkets, larger grocery outlets, supercenters, and F&V markets within census tracts or half a mile from the tract boundary) to less healthy food outlets (fast food restaurants, small grocery outlets, and convenience outlets within census tracts or half a mile from the tract boundary).

Skin carotenoids were assessed using the "Veggie Meter TM" which utilizes reflection spectroscopy to non invasively skin carotenoids as an objective measure of F&V consumption. Bivariate and multivariable statistics were used to examine the associations.

Participants were recruited within two supermarkets both located within the US “Stroke Belt” (a geographical region with elevated levels of cerebrovascular accident) and have:

- a rate of 30% of adult obesity,
- 20% of adults reporting fair or poor health, and
- over 20% of the population being food insecure.

There were a total of 136 participants: mostly female (75.7%) and African American (86.0%), with an annual household income of less than $40,000 (74.2%).

Food environment and skin carotenoid levels

We found a statistically significant positive association between skin carotenoid scores and mRFEI; these results indicate that skin carotenoid scores increased in a food environment with a higher ratio of healthy outlets to unhealthy outlets. This suggests that long-term F&V consumption may be influenced not simply by proximity to a preferred supermarket, but also by the ratio of healthy to less healthy food retail outlets in the proximal food environment. This finding is consistent with previous research, which found county-level obesity was associated with RFEI (food swamps[a]) versus proximity to supermarkets (food deserts[b])[4].

WIC participation and skin carotenoid levels

In adjusted analyses, we found positive associations between WIC participation and skin carotenoid levels. Those receiving WIC had a higher average skin carotenoid score when compared to those not receiving WIC (284 for WIC participants versus 247 for non-participants, p = 0.04). This is consistent with prior findings that participation in WIC has a positive influence on dietary behaviors. We also found that the typically negative impact of distance to food stores on F&V consumption may have been reduced by participation in WIC (Figures 1), suggesting a protective benefit for those with lower food access. There was a small number of WIC participants (n = 12) in the current study, so future studies should investigate this association in a larger sample.

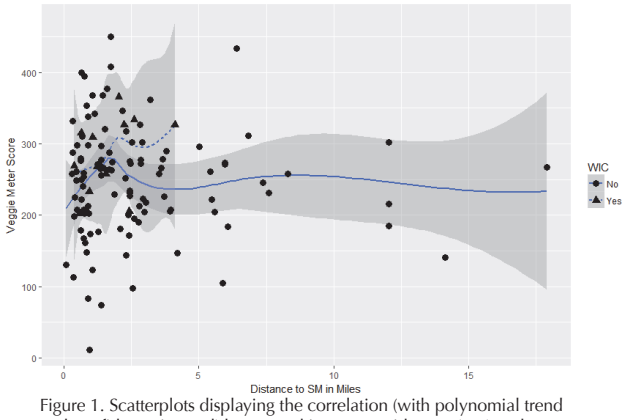

Figure 1. Scatterplots displaying the correlation (with polynomial trend and confidence interval) between skin carotenoid score (avg) and distance to supermarket where surveyed in miles

In conclusion, WIC participation and a lower ratio of unhealthy food stores to healthy food stores are associated with an objective measure of fruit and vegetable consumption (skin carotenoids assessed) among a sample of supermarket customers. These findings support the potential benefit of WIC participation in maintaining diet quality despite reduced accessibility.

a. Neighborhoods where fast food and junk food inundate healthy alternatives
b. Residential areas with limited access to affordable and nutritious food

Based on: McGuirt JT et al. Association between spatial access to food outlets, frequency of grocery shopping and objectively-assessed and self-reported fruit and vegetable consumption. Nutrients. 2018 Dec; 10(12): 1974.

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