

The Global Fruit & Veg Newsletter



n° 21

May
2017

The updated healthy nutrition program for Women, Infants and Children - WIC

WIC – the USA's Special Supplemental Nutrition Program for Women, Infants and Children has been providing healthy food, breastfeeding support, referrals to health and social services, and nutrition education to vulnerable income qualified American families with nutritional needs for over 40 years. The program, administered by the United States Department of Agriculture, serves around 7.5 million low-income women and infants, and children between the ages of 1 and 5. WIC is America's premier public health nutrition program.

A cornerstone of WIC is the food package. Comprised of healthy foods selected to meet the nutritional needs this vulnerable population, they are prescribed through WIC to support an individual's healthy growth and development. WIC foods include milk, cheese, yogurt, peanut butter, legumes, canned fish and whole grains.

WIC participants receive their healthy food prescription on either an electronic benefit card or paper voucher. In addition, participants receive a Cash Value Voucher (CVV) to spend exclusively on fruit and vegetables.

The WIC food package is reviewed every 10 years to ensure it is based on the most current scientific evidence, aligns with the Dietary Guidelines for Americans and is culturally appropriate to meet the diverse population of families WIC serves across the United States. In January 2017, the National Academy of Sciences, Engineering and Medicine (NASEM) published a ten-year review of the WIC food package along with recommendations for changes to the WIC food package that would 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. The proposed changes would help the WIC program provide an enhanced food package that is further tailored to the nutritional needs of the participant, effectively maximizing the nutritional benefit that each client receives from their food.

In particular, NASEM recommends increasing the consumption and choice in whole grains and fruit and vegetables, decreasing the amount of certain foods that were found to be offered in too large a quantity or were burdensome to WIC families, and improving support for breastfeeding mothers.

As well as making recommendations for changes to the food package, NASEM also made recommendations for future research. This speaks to the continued and critical importance of research in the field of WIC, the food package and the essential need to assure that the food package stays relevant.

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



Rev. Douglas A. Greenaway
President & CEO
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Self-reported vegetable intake among WIC-enrolled women: Associations with social desirability trait

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Previous work has shown that self-reported dietary behavior is susceptible to social desirability bias, the tendency to respond in a manner consistent with expected norms¹. A social desirability-related upward bias (overestimate) has been observed for self-reported intakes of foods and nutrients for which increased intake is encouraged, including fruit and vegetable (F&V) intake². The extent to which social desirability trait biases responses to particular F&V intake measures therefore requires examination. An important first step toward making such a determination is the examination of whether social desirability trait is associated with intake estimates derived from a tool in question. Conducted in a sample of 744 women enrolled in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), this study examined whether social desirability trait was associated with self-reports of the frequency and quantity of F&V intake, and whether associations, if found, were moderated by participant characteristics.

Design and analysis

This cross-sectional study examined baseline data from WIC Fresh Start (WFS), a randomized controlled trial of nutrition education to promote farmers' market F&V purchases and consumption among women enrolled in WIC. Social desirability trait was assessed with a 10-item version of the Marlowe-Crowne Social Desirability Scale. Two dimensions of F&V intake were assessed: the frequency of intake (times per day F&V were consumed) and the quantity of intake (cups per day of F&V consumed). Frequency of intake was measured with the 2013 Behavioral Risk Factor Surveillance System (BRFSS) F&V module. The F&V module queries intake of the following 6 items: 100% fruit juice, fruit, cooked or canned beans, dark green vegetables, orange-colored vegetables, and other vegetables. The quantity of intake was assessed with a 2-item measure developed by the National Cancer Institute. One item each assesses the number of cups of F&V (including F&V juices) the participant consumes daily. The sample was stratified into two groups based on the median split of the distribution of social desirability scores (high and low social desirability trait, respectively), and mean differences in F&V intake by social desirability trait were

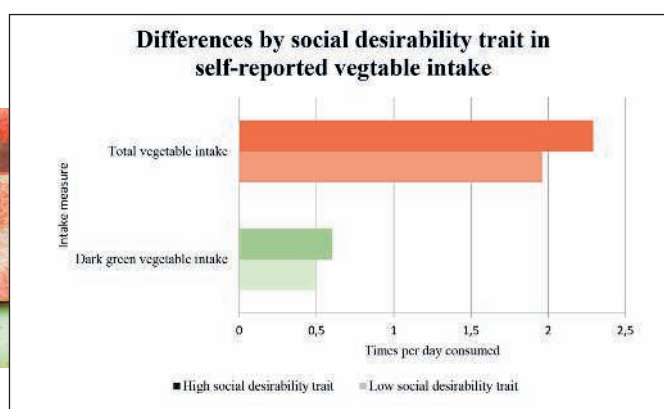
examined with independent samples t tests. Linear regression analyses were used to examine the relationships between social desirability trait and composite measures of the reported frequency and quantity of F&V intake (assessed separately) as well as the reported frequency of intake of F&V items assessed by the BRFSS F&V module.

Results

As shown in the figure, differences by social desirability trait were found in times per day total vegetables and dark green vegetables were reported to have been consumed (intakes were higher in the high as compared with the low social desirability trait group). Social desirability trait was significantly associated with times per day vegetables were reported to have been consumed ($\beta = 0.08$, p -value = 0.03) and with the BRFSS item assessing the reported frequency of dark green vegetable intake ($\beta = 0.08$, p -value = 0.03) but was unrelated to the composite measure of times per day fruit was consumed or to measures of the quantity of F&V intake. Breastfeeding status moderated the relationship between social desirability trait and self-reported vegetable intake. Among breastfeeding women, social desirability trait was unrelated to reported intake, whereas among non-breastfeeding women, it was positively associated with intake (a 1-unit increase in the social desirability score was associated with a 0.12 increase in times per day vegetables were reported to have been consumed).

As social desirability trait increases, self-reported total and dark green vegetable intake (as measured by the BRFSS F&V module) increase

In this sample of WIC participants, social desirability trait was positively associated with self-reported total vegetable intake and dark green vegetable intake as measured by the BRFSS F&V module. The associations highlight the need for further research using comparative measures of "true intake" to determine whether social desirability trait is a source of reporting error (whether persons with a high social desirability trait overestimate their intake) or an influence on intake (e.g., whether persons with a high social desirability trait consume more F&V). Research also is needed to identify factors that explain differences found by breastfeeding status in the associations between social desirability trait and self-reported vegetable intake.



Based on: Di Noia J, Cullen KW, Monica D. Social desirability trait is associated with self-reported vegetable intake among women enrolled in the Special Supplemental Nutrition Program for Women, Infants, and Children. *J Acad Nutr Diet.* 2016;116:1942-1950.

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Choice architecture to increase WIC fruit and vegetable purchases: Improving visibility and quality of fresh produce in urban corner stores

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In 2009, the U.S. Department of Agriculture revised the Special Supplemental Program for Women, Infants and Children (WIC) food packages to provide cash-value vouchers for purchase of fruit and vegetables. In low-income, urban neighborhoods, many corner stores accept WIC vouchers and are where families shop for groceries. Typically, the most prominent items displayed in corner stores, near the entrance and the check-out counter, include unhealthy snacks, sugar-sweetened beverages, and baked goods. Fresh fruit and vegetables have limited shelf space, are located in the back of the stores, and are often of poor quality. "Choice architecture" interventions place healthy food and beverages in highly visible and convenient positions in order to increase sales and selection of these items. This study was a randomized, controlled trial of six corner stores in a low-income community to determine if a choice architecture intervention that increased the visibility and quality of fresh produce would result in increased redemption of the WIC fruit and vegetable vouchers.

Participation and randomization of urban corner stores

Corner stores were recruited in Chelsea, Massachusetts, a low-income urban community located near the city of Boston. Stores were eligible to participate if they accepted both WIC and Supplemental Nutrition Assistance Program (SNAP) benefits and if they agreed to be randomized to the intervention or to the control group that did not receive the intervention. Stores were recruited in the spring of 2013, and three stores were assigned to the intervention during November 2013. The intervention period lasted from December 2013 through April 2014.

Study staff worked with intervention stores to determine which changes would be feasible and acceptable for each store. Depending on needs, the store was provided with basic supplies to set up produce displays (shelving, baskets, etc.) near the front of the store. Each store owner also met with a "produce consultant" who provided advice about how to stock and maintain a higher quality of fresh fruit and vegetables. Each store was responsible for choosing and ordering their own produce.

Choice architecture increased WIC fruit and vegetable voucher sales

The primary outcome was sales with the WIC fruit and vegetable cash-value vouchers at the study stores. The Massachusetts state WIC office provided aggregate monthly sales data for each of the participating stores. Trends in fruit and vegetable voucher and non-fruit and vegetable voucher sales during the baseline and intervention periods are shown in the Figure. Before the intervention period (December 2012–October 2013), fruit and vegetable voucher and non-fruit and vegetable voucher (i.e., used for bread, milk, and other food staples) sales decreased similarly in both intervention and control stores by an average of \$16/month. During the intervention period (December 2013–April 2014), fruit and vegetable voucher sales increased in the intervention stores by \$40/month but decreased in the control stores by \$23 per month ($p=0.036$), (Figure, Panel A). Non-fruit and vegetable voucher sales during the intervention period were not different between the intervention and control stores ($p=0.45$), (Figure, Panel B).

WIC and SNAP customers reported more fruit and vegetable purchases

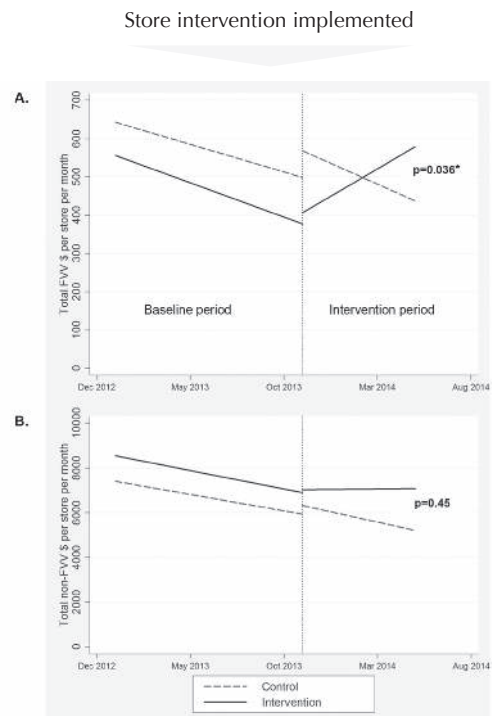
Secondary outcomes were self-reported purchase of fruit and vegetables by customers who were interviewed when exiting the study stores during the baseline period and at the end of the intervention period. Overall, 23% (134/575) of exit interview participants reported they used WIC, and 37% (212/575) reported using SNAP. Among all exit interview participants, there was

no significant difference between intervention and control store customers in the change in purchasing fresh fruit and vegetables or in planning to purchase fresh fruit and vegetables (before entering the store) between the baseline and intervention periods. However for customers using SNAP benefits, the change from baseline to the intervention period in customers reporting they purchased fresh fruit and vegetables was significantly higher for intervention store customers than for control store customers (6% vs. -15%, $p=0.007$), and the change in the proportion of those reporting that they planned to purchase fresh fruit and vegetables before entering the store was also higher (3% vs. -15%, $p<0.001$). There were similar but not statistically significant changes for customers using WIC for reporting purchasing (18% vs. -2%, $p=0.11$) and planning to purchase (15% vs. -6%, $p=0.17$) fresh fruit and vegetables.

Implications for improving fresh produce purchases in low-income communities

This study demonstrated that a simple choice architecture intervention to improve the visibility and quality of fresh produce resulted in increased purchase of fruit and vegetables by corner store customers participating in the WIC program, based on objective state-level data. The exit interviews indicated that intervention store customers using SNAP also increased purchase of fresh produce. In the future, the United States Department of Agriculture might consider policies for WIC and SNAP-certified stores that encourage displaying fruit and vegetables at the front of the stores and that provide education for stores about how to stock and maintain fresh produce. These policies could help improve healthy food choices and reduce disparities in obesity in low-income families.

Figure: Trends in WIC fruit and vegetable voucher (FVV, Panel A) and WIC non-fruit and vegetable voucher (non-FVV, Panel B) sales at intervention and control stores in Chelsea, MA, December 2012–April 2014.



Based on: Thorndike AN, Bright OM, Dimond MA, Fishman R, Levy DE. Choice architecture to promote fruit and vegetable purchases by families participating in the Special Supplemental Program for Women, Infants and Children (WIC): randomized corner store pilot study. Public Health Nutrition. 2016 Nov 28;1-9. [Epub ahead of print] DOI:10.1017/S1368980016003074.

Barriers and facilitators to improve fruit and vegetable intake among WIC-eligible pregnant latinas

Amber Hromi-Fiedler and Rafael Pérez-Escamilla

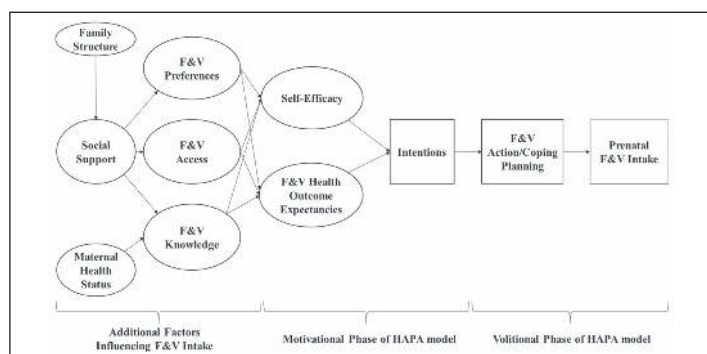
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Fruit and vegetable consumption during pregnancy

The potential maternal and infant health benefits of increasing prenatal fruit and vegetable (F&V) intake suggest it is a key intervention point for supporting optimal pregnancy and birth outcomes. Yet, improving F&V consumption during pregnancy requires modifying prenatal dietary behavior. Pregnancy is an ideal time, a true “teachable moment”, when women may be more committed to adopting healthier behaviors to minimize the health risks to themselves and their unborn baby¹. Helping women to increase their prenatal F&V intake requires assisting them to bridge the gap between their intention to increase prenatal F&V intake (i.e. intention to change) and actually increasing F&V intake (i.e. the action itself) through proper planning.

The Health Action Process Approach (HAPA)

The Health Action Process Approach is a behavior change model that identifies key areas in the adoption and maintenance of health behaviors that can help a woman move from intentions to behaviors through action and coping planning^{2,3}. This model emphasizes two distinct stages involved in the behavioral change process, a motivational phase and a volitional phase (Figure)^{2,3}. In the motivational phase of the HAPA model, F&V health outcomes expectancies (i.e., the health outcomes women expect for themselves and their babies if they do not eat F&Vs during pregnancy) help a woman to weigh the pros and cons of consuming more F&Vs during pregnancy. Taking into account their outcome expectancies, women consider whether they have the ability (or perceived self-efficacy) to change their behavior (e.g., eating more F&Vs during pregnancy even with cravings for junk food). Both perceived self-efficacy and F&V health outcomes expectancies help a pregnant woman form an intention to increase prenatal F&V intake. In the volitional phase, the intention to change F&V intake becomes transformed into specific action plans which define when, where, and how to increase F&V intake. In this phase the coping plans to address potential barriers that might hinder more F&Vs intake during pregnancy are also developed.



Study objectives

We conducted forty-five in-depth interviews with low-income pregnant overweight/obese Latinas eligible for the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) to: 1) identify barriers and facilitators to prenatal F&V intake, and 2) inform a conceptual behavior change model based on the HAPA framework to improve their prenatal F&V intake⁴.

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Barriers and facilitators to prenatal F&V intake

Social support was the primary driving force behind prenatal F&V intake among WIC-eligible Latinas. Family/friends were the principal source of emotional, psychological, instrumental (i.e. money or food), and informational F&V support. This support empowered women to initiate eating F&Vs or return to consuming F&Vs prenatally. Lack of familial support signified a lack of a cohesive family structure, making women feel isolated and alone, which discouraged them from cooking and eating healthy, negatively affecting their prenatal F&V intake.

Several barriers emerged influencing prenatal F&V intake. F&V access was limited due to lack of easily accessible supermarkets within the city, limited availability of F&Vs at local convenience stores, and the high cost of F&Vs. Distinct F&V dislikes resulted from unpleasant tastes/smells, cravings for junk food, spoiled F&Vs, and cultural F&V preferences, subsequently discouraging prenatal F&V intake. Women experiencing pregnancy complications, such as gestational diabetes, decreased their prenatal F&V intake to improve their prenatal health status.

Higher F&V knowledge, increased self-efficacy, intentions to change, and having F&V action/coping planning strategies facilitated prenatal F&V intake. Women with higher F&V knowledge understood the health benefits of F&Vs for a mom and her unborn baby and/or knew how to cook F&Vs. Self-efficacy was higher for women who were already consuming/enjoying F&Vs and believed that they could improve the health outcomes for themselves and their unborn baby by consuming more F&Vs prenatally. Intending to change meant that there was strong internal and external motivation to increase prenatal F&V intake. Action and coping planning strategies (e.g. masking undesired F&Vs flavors) facilitated an increase in prenatal F&V intake.

F&V health outcome expectancies also played a role. Women associated poorer maternal and fetal health outcomes expectancies (e.g. suboptimal fetal growth) with less prenatal F&V intake, and better outcomes (e.g. preventing pregnancy complications) with higher prenatal F&V intake.

F&V behavioral change model utilizing HAPA

Self-efficacy, F&V health outcome expectancies, intentions to change, and F&V action/coping planning strategies were reflected in our results, showing that the HAPA model is relevant for a F&V behavior change model to increase prenatal F&V intake among WIC-eligible Latinas. Six additional factors were identified as essential to prenatal F&V intake: family structure, social support, F&V preferences, F&V access, F&V knowledge, and maternal health status. The HAPA model was expanded to include these distal factors, which each influenced self-efficacy and F&V health outcome expectancies, leading to intentions developing, F&V action/coping planning strategies being adopted, and subsequently affecting prenatal F&V intake.

Conclusion

The HAPA model proved to be very useful in identifying a behavior change model that includes additional key factors that need to be addressed to improve the likelihood that pregnant WIC Latinas can increase their prenatal F&V intake and improve related pregnancy health outcomes.

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