

# The Special Supplemental Nutrition Program for Women, Infants, and Children Fresh Start Randomized Controlled Trial: Baseline Participant Characteristics and Reliability of Measures



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## ABSTRACT

**Background** The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Fresh Start (WFS) is a randomized controlled trial of nutrition education to promote farmers' market fruit and vegetable (F/V) purchases and consumption among women enrolled in WIC.

**Objectives** To describe the baseline characteristics (demographics and F/V intake [including F/V juice]) of WFS participants, compare the characteristics with those of WIC participants in New Jersey and nationwide, and examine the baseline reliability of study measures.

**Design** Cross-sectional.

**Participants/setting** Seven hundred forty-four women served by a New Jersey–based WIC agency located in a densely populated, urban area.

**Main outcome measures** Demographic characteristics; newly developed measures of farmers' market–related knowledge, attitudes, and skills; and validated measures of F/V intake.

**Statistical analyses** Descriptive statistics to characterize the sample. One-sample *t* and one-sample sign tests to compare the characteristics with reference values. For dietary behaviors, comparisons were with state and national estimates of the frequency and quantity of F/V intake.

**Results** Participants had a mean age of 28.9±6.8 years and were predominantly Hispanic (59%), US-born (60%), never married (41%), unemployed (62%), receiving assistance other than WIC (70%), and food insecure (55%). Half reported a high school education or less. Higher proportions of WFS participants than WIC participants nationwide were represented among demographic groups at increased risk of inadequate F/V intake. WFS participants consumed more fruit (2.7 cups/day) but less vegetables (1.4 cups/day) than did women nationwide (1.1 and 1.4 cups/day, respectively;  $P<0.01$ ). Although participants consumed recommended amounts of fruit, their vegetable intake was below recommended levels. All but two of the measures developed for the study had reliability coefficients at or above 0.60.

**Conclusions** Intervention is warranted to improve participants' vegetable intake. Registered dietitian nutritionists should be aware of F/V intake differences that may require differential intervention strategies.

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**F**RUIT AND VEGETABLE (F/V) INTAKE ADDS NUTRIENTS to diets; plays an important role in the prevention of chronic diseases such as heart disease, cancer, stroke, and diabetes; and is associated with a reduced incidence of obesity.<sup>1-3</sup> Despite the health benefits of a diet rich in F/V, during 2007 to 2010, 76% of the total US population did not meet fruit intake recommendations and 87% did not meet vegetable intake recommendations.<sup>3</sup> Low-income individuals are among those who are least likely to meet current dietary guidelines for F/V intake and may therefore benefit disproportionately from intervention to encourage increased F/V consumption.<sup>4</sup>

Federal nutrition assistance programs reach individuals and populations with the greatest health disparities and can play a vital role in promoting F/V intake through access to nutritious foods.<sup>5</sup> The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) serves low-income pregnant and postpartum women, infants, and children up to age 5 years (incomes below 185% of US Poverty Income Guidelines) who are at nutritional risk (ie, anemic, underweight or overweight, have a history of pregnancy complications or poor pregnancy outcomes, inappropriate nutrition/feeding practices, or failure to meet current dietary

guidelines).<sup>6</sup> The program provides healthy foods to supplement diets via WIC food packages; nutrition education; and counseling and referrals to other health, welfare, and social services.<sup>7</sup>

In 1992, Congress established the WIC Farmers' Market Nutrition Program (FMNP) to provide fresh, unprepared, locally grown F/V to WIC participants and to raise F/V awareness, use, and sales at farmers' markets and roadside stands.<sup>8</sup> Participants receive vouchers redeemable for \$10 to \$30 of produce from WIC-authorized farmers during the farmers' market season (typically June through November).<sup>8</sup> Changes to the WIC food package in 2009 included the addition of a cash value voucher (CVV) for F/V purchases.<sup>9</sup> State WIC agencies have the option to approve CVVs for use at farmers' markets.<sup>10</sup> Whereas FMNP vouchers are issued seasonally and not all WIC participants are guaranteed to receive them due to funding constraints, CVVs are issued monthly to all women and children participating in WIC.<sup>11</sup> In states authorizing their redemption at farmers' markets, CVVs provide WIC participants with ongoing opportunities to purchase F/V at these venues. Despite the promise of FMNP vouchers and CVVs for improving access to fresh F/V, the FMNP voucher redemption rate is modest (59% nationwide in 2014). Among states tracking the redemption of CVVs at farmers' markets, the redemption rate is <1%.<sup>9,12</sup>

The WIC Fresh Start (WFS) randomized controlled trial is an ongoing evaluation of a theory-driven, web-based nutrition education lesson to promote farmers' market F/V purchases and consumption among women enrolled in WIC. This article describes the baseline characteristics of women enrolled in the trial. Specific aims were to report participant demographic characteristics and F/V intake, compare the demographic characteristics with those of WIC participants in New Jersey and nationwide, and compare F/V intake among WFS participants with F/V intakes reported among women in New Jersey and nationwide. Information on the baseline reliability of study measures also is presented. Findings will advance understanding of characteristics of WIC participants who enroll in studies of this type. This information will aid researchers in designing similar studies, and will add to the paucity of data on F/V intake in this nutritionally at-risk and underserved population.

## METHODS

### Design

This cross-sectional study examined baseline data from the WFS trial described in detail elsewhere.<sup>13</sup> Stratified based on FMNP voucher receipt, participants are orally administered a pretest and randomized (using a computer-generated binary randomization sequence) to receive the WFS lesson or existing online health education. Two weeks after the lesson, participants are contacted by telephone to complete the posttest. Telephone-administered follow-up assessments are conducted 3 and 6 months after the posttest.

### Sample

Located in a densely populated urban area, the study setting was a New Jersey-based WIC agency serving 21,500 WIC participants monthly. Inclusion criteria were being a pregnant or postpartum WIC participant or female caregiver of an infant or child WIC participant with no known restrictions on

food intake and not high-risk (as defined by WIC). WIC high-risk status is based on an extensive list of statewide risk criteria (eg, being anemic or having a body mass index at or above 30). High-risk women were excluded because they are required to receive in-person nutrition education and cannot satisfy their nutrition education requirement for recertification by completing an online lesson (as can those who are not high-risk). Trained bilingual (English/Spanish) research assistants (RAs) offered women the opportunity to participate while in the waiting room of the WIC clinic and screened them for eligibility. Of 1,345 women who were approached, 64 were ineligible, 537 were eligible but declined to participate, and 744 were enrolled (58% consent rate). All women provided informed written consent before their study involvement. The study was approved by the William Paterson University Institutional Review Board for Human Subject Research (2014-368). Data were collected between June 1, 2015, and August 12, 2015.

## Measures

**Farmers' Market-Specific Knowledge, Attitudes, and Skills.** Formative research with state and local WIC agency representatives (n=5) and participants (n=54) identified hypothesized mediators of farmers' market F/V purchases and consumption that are the focus of the lesson. These included lack of knowledge of the FMNP and WIC-authorized farmers' markets, negative attitudes toward farmers' market F/V (including farmers' market F/V food safety concerns), limited awareness of locally grown, seasonal F/V (items that are in season and selection, storage, and parts eaten of the items), limited asking skills (extent of asking farmers about their produce), limited F/V food safety and farmers' market F/V preparation skills, and low positive outcome expectations for consuming locally grown F/V.<sup>13</sup> Despite the availability of instruments assessing adult F/V-related knowledge, attitudes, and skills, measures of farmers' market-specific constructs are lacking and were therefore developed. Adapted from existing instruments,<sup>14-23</sup> initial item pools for assessing each construct were written. In light of the number of constructs and the aim of minimizing response burden, brief measures consisting of up to 10 items per scale were developed. Response formats were yes/no, true/false, and multiple choice or Likert-oriented depending on the nature of the questions. Cognitive testing with 15 WIC participants gathered feedback on the clarity and interpretability of scale items and response formats. The measures were accordingly revised. Measures developed for the study are shown in [Table 1](#).

**Demographic Characteristics.** Participants reported their birthdate and age and responded to closed-ended items assessing their race, origin, nativity (born in the United States or born outside of the United States [defined as outside of the United States and its territories, including Puerto Rico]), country of birth (foreign-born), preferred language (English, Spanish, or other), other language (preferred language of other), languages spoken at home (English, Spanish, or other), other language (other language spoken at home), marital status, educational attainment, educational attainment of spouse or partner, number of children in the household younger than age 19 years, number of children in the household aged 2 to 5 years,

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