

# Feasibility and Acceptability of Dietary Intake Assessment Via 24-Hour Recall and Food Frequency Questionnaire among Women with Low Socioeconomic Status

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## ARTICLE INFORMATION

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## ABSTRACT

**Background** Comprehensive evaluation of dietary interventions depends on effective and efficient measurement to quantify behavior change. To date, little is known regarding which self-reported measure of dietary intake is most feasible and acceptable for use in evaluation of the effectiveness of diet intervention studies among underserved populations.

**Objective** This research focused on evaluating feasibility and acceptability of two self-report measures of diet.

**Design** Cross-sectional.

**Participants/setting** Two interviewer-administered 24-hour recalls and a 110-item food frequency questionnaire (FFQ) were administered to both English- and Spanish-speaking participants (n=36) by native English- and Spanish-speaking research assistants. On completion of both dietary assessments, participants were interviewed regarding their preference of measure.

**Main outcome measures** *Feasibility* for completion of the dietary assessment measures was determined for contacts and retention. *Acceptability* of the measures was determined through responses to open- and closed-ended questions.

**Results** During the 5-month trial, 36 participants were enrolled; 29 completed both intake measures, and 26 completed both measures and the interview. Participants were mainly Hispanic/Latina (72%), with a mean age of 37.0 ( $\pm$ 7.6) years. Feasibility targets were met for contacts (1.9, 1.6, 1.8 contact attempts to complete each diet assessment measure with a target of  $\leq$ 2) and for retention with 89% and 91% completing two 24-hour recalls and the FFQ, respectively. Participants indicated both diet assessment methods were generally acceptable; both positive and negative comments were received for use of the FFQ.

**Conclusion** Dietary assessment with the use of 24-hour recalls or an FFQ can be feasible and acceptable among women with low socioeconomic status, although care should be taken to address cultural appropriateness in the selection of the measurement method.

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**D**IETARY INTAKE MEASUREMENT IS ESSENTIAL FOR both nutrition epidemiological and intervention research. No single dietary assessment method that measures true, usual intake in free-living populations is available to researchers.<sup>1-3</sup> Methods have been developed to provide an estimate of true intake, although none are free from measurement error. Diet records, 24-hour recalls, and food frequency questionnaires (FFQs) are the tools most often used to measure food and nutrient intake in research studies.<sup>4,5</sup>

The 24-hour recall method was developed to measure food or nutrients consumed by an individual on 1 or more days.<sup>6</sup> Benefits to use of 24-hour recalls include the ability to

estimate absolute rather than relative intake and their “open-ended” format, which does not limit participants in their responses regarding the foods they eat. Limitations of this method include individuals’ reliance on episodic memory (a person’s unique memory of a specific event<sup>7</sup>), error in representing usual intake (particularly if only a small number of days are captured), and other random error.<sup>8</sup>

FFQs were developed to estimate dietary intake over longer periods, and in full-length FFQs, individuals are asked to report the frequency of usual intake of approximately 100 to 200 foods, generally grouped by similarities in nutrient composition. FFQs have several applications in diet research. One common use is in large epidemiological studies in which

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researchers measure average long-term dietary exposures within populations to rank individuals according to their level of nutrient intake to determine associations with health outcomes. Advantages of FFQs include lower relative cost and reliance on semantic (memory of general facts) rather than episodic memory. Limitations include error associated with estimation of individuals' absolute intake, participant burden associated with completion of often lengthy questionnaires, potential for decreased accuracy among participants who become bored or fatigued, potential for differential bias between those in the intervention group and those in control groups, and known systematic error.<sup>9</sup>

Given the current landscape of dietary assessment methods, there is no consensus on which method is most appropriate for measuring dietary change in intervention research. In one large systematic review, the use of 24-hour recalls and FFQs in intervention trials was examined, and investigators determined that both methods demonstrated differences in dietary intake with a similar degree of responsiveness.<sup>10</sup> Which method is chosen is determined by a number of factors, including level of precision needed, research design, and cost. A number of additional factors may require special consideration when dietary intake is assessed in underserved populations, including individuals with low income and those who belong to racial/ethnic minority groups. These factors include the feasibility and acceptability of the measure. It is unclear whether FFQs or 24-hour recalls are equally feasible and acceptable to underserved populations. A review of intervention studies to measure change in fruit and vegetable intake among low-income and racial/ethnic minority populations revealed that for the nine intervention studies cited, six included a version of an FFQ and three included 24-hour recalls.<sup>11</sup> Additional research has sought to develop valid and acceptable measures of dietary intake among low-income populations in clinical settings, yet there is less research on the use of full-length FFQs and/or 24-hour recalls.<sup>12,13</sup>

The objective of this study is to examine the feasibility and acceptability of two self-reported dietary assessment methods (a full-length FFQ and two 24-hour recalls) in underserved populations. Findings from this study can be used to guide future decisions about the most appropriate selection of diet intake assessment tools for use in intervention research.

## METHODS

### Participants

Participants were enrolled from the adult cohort (n=211) (English and Spanish-speaking women residing in 10 family public housing developments) of a parent trial that examined a 1-year environmental-level intervention.<sup>14</sup> Data collection for the parent trial was completed by 2015. Recruitment began by accessing a list from the parent study containing participants' names, addresses, and primary spoken language. Flyers were mailed to participants from the parent study notifying them of the new study. Afterward, study staff conducted up to three home visits to enroll individuals. To be included in the current study, participants were required to be between the ages of 18 and 72 years; to live in public housing with no plans to move within the next 6 months; to be a participant in the parent study; and to be able to

understand English or Spanish sufficiently to comprehend the purpose, procedure, risks, benefits, and voluntary nature of the study, as well as to complete the surveys and provide information in either language. Participants provided oral consent as a waiver of documentation of informed consent was obtained. Recruitment ended after contact was attempted at least three times for all eligible participants. Participants received a \$10 gift card for each assessment they completed, up to \$30. This study was approved by the Boston University Medical Campus Institutional Review Board.

### Design and Measurement/Assessment

Pairs of research assistants (at least one of whom was bilingual in Spanish and English) administered two dietary assessment methods on paper forms: (1) two interviewer-administered 24-hour dietary recalls and (2) one interviewer-administered FFQ (the Block FFQ 2005).<sup>15</sup> The first batch of 24-hour recall intake data was collected within 30 days of enrollment. The second batch of 24-hour recall intake data was collected within 30 days of the first recall, and the FFQ intake data were collected within 30 days of the second 24-hour recall.

**24-Hour Recalls.** Study staff were trained in administering 24-hour recalls using a multiple-pass method.<sup>16,17</sup> Interviews were conducted in each participant's preferred language. Staff used scripts, visuals, and other aids such as measuring cups and food models to assist participants. On completion of the 24-hour recall data collection, participants were asked to schedule a second 24-hour recall, and after the second 24-hour recall, an appointment was made for completion of the FFQ.

**FFQ.** Food frequency data were collected using the pre-printed, paper-based 110-item Block Food Questionnaire 2005 in a bilingual format.<sup>15</sup> Research assistants administered the FFQ by reading the instructions and questions to the participants in either Spanish or English, depending on the participant's preference, and marked the participant's answers on the form. To promote accuracy and completeness of the survey, staff used a pictorial of serving sizes, provided by NutritionQuest as a companion to the FFQ, and a "flashcard" that contained the response options for "how often" reported foods were consumed.

**Feasibility.** To evaluate feasibility, research assistants noted on a tracking form whether the participant was home and willing to complete the interview; the number of contacts required to complete each diet assessment; the date and time of each visit; and the participant's response to each home visit.

**Acceptability.** After participants completed both the 24-hour recall and FFQ dietary assessments, they completed a structured interview conducted in their preferred language with closed- and open-ended questions designed to elicit feedback regarding the acceptability of each diet assessment method. The closed-ended questions asked participants directly which dietary assessment method they preferred. The open-ended questions were designed to elicit from participants what they liked or disliked about each dietary

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