

Development and Evaluation of a Brief Questionnaire to Assess Dietary Fat Quality in Low-income Overweight Women in the Southern United States

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ABSTRACT

Objective: To develop a brief questionnaire to assess dietary fat quality, the Dietary Fat Quality Assessment (DFQA), for use in dietary counseling to reduce heart disease risk.

Methods: A subsample of 120 underserved, midlife women enrolled in a randomized, controlled weight loss trial completed baseline and follow-up telephone surveys. Main outcome measures included dietary fat components (total fat, saturated fat, polyunsaturated fat, monounsaturated fat, omega-3 fatty acids, and cholesterol).

Results: Assessments of major dietary fat components using the DFQA and a food frequency questionnaire were significantly correlated, with correlation coefficients of 0.54–0.66 ($P < .001$). Intra-class correlation coefficients to assess reliability ranged from 0.48 to 0.59 for each of the fat components studied.

Conclusions and Implications: The DFQA provides a reasonable assessment of dietary fat quality associated with coronary heart disease risk and may prove useful as a brief assessment tool to guide dietary counseling given to reduce heart disease risk.

Key Words: dietary fat quality, brief questionnaire, diet assessment, midlife women, low income (*J Nutr Educ Behav.* 2013;45:355–361.)

INTRODUCTION

Dietary fat has been implicated in the development of coronary heart disease (CHD).^{1–3} Prior guidelines related to dietary fat intake for CHD risk reduction recommended a decrease in total and saturated fat intake.^{4,5} However, recent studies suggest that dietary fat quality (the types of fat in the diet) more accurately predicts CHD outcomes, and there is compelling evidence from cohort studies,^{6–8} clinical trials,⁹ and mechanistic studies¹⁰ that replacing satu-

rated fat with polyunsaturated fat reduces the risk of CHD.

Current methods to assess dietary fat quality include food frequency questionnaires (FFQs), diet history, 24-hour recalls, and dietary records.^{11,12} Although these methods are often appropriate for assessing the nutrient composition of a diet, many are time intensive and impractical for adequate dietary fat assessment in clinical settings. For example, most FFQs include 50–200 items and multiple 24-hour recalls or dietary records are required to accu-

rately assess habitual intake.^{11,12} Although brief questionnaires to assess dietary fat intake have been validated in the United States (US),^{13–16} these have focused on total and saturated fat intake and not overall fat quality.¹⁷ Thus, there is a need to develop and validate a fat quality questionnaire for US populations that is brief, easily administered, and useful for clinical purposes.

The objective of this study was to develop and validate the Dietary Fat Quality Assessment (DFQA), a brief fat quality measurement tool designed for use in clinical settings. This brief reports test-retest reliability and validity results for the measurement of total fat, saturated fat, polyunsaturated fat, monounsaturated fat, omega-3 fatty acids, and cholesterol.

METHODS

Participants

The authors conducted this study in 2009 on a subsample ($n = 120$) of participants in the Weight-Wise II Program ($n = 189$), a randomized, controlled weight loss trial enrolling

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low-income, midlife women conducted in North Carolina county health departments ($n = 6$). This clinical trial involved the training of current health department staff to deliver an evidence-based weight loss intervention that included 16 weekly group sessions, with a focus on reduced caloric intake and 150 minutes weekly of moderate intensity physical activity. The study design is described in detail elsewhere.¹⁸ Inclusion criteria were those of the parent study, including low-income, English-speaking women aged 40–64 years with a body mass index (BMI) of 27.5–45. The aim was to enroll 120 participants based on sample sizes used in similar validation studies, also recognizing that an n of 120 provides ample power (99% power to detect a correlation of 0.5 at $\alpha = .05$) for this type of analysis.^{19,20}

The Institutional Review Board at University of North Carolina, Chapel Hill approved the study and all participants provided informed consent.

Measures

The authors invited women eligible to participate in Weight-Wise II to an enrollment visit conducted by trained staff, in which initial baseline measures included weight, height, blood pressure, and a demographic questionnaire to assess self-reported medical history.¹⁸ To assess baseline dietary fat intake, an experienced telephone interviewer administered the DFQA to all Weight-Wise II participants approximately 3 weeks after the enrollment visit. The DFQA was adapted from the Dietary Risk Assessment (DRA), a brief instrument to guide dietary counseling to reduce CHD risk that was developed for use in clinical settings.^{19,20} The DRA was revalidated in 2007 to reflect revised cardiovascular dietary recommendations¹⁹ and focused on foods most relevant to a Southern population, including items selected to address total (30 items) and saturated fat (32 items), but not monounsaturated and polyunsaturated fats. The DFQA consists of 20 main questions, 10 of which are largely unchanged from the DRA and 10 of which were added and/or modified to specifically address common food items high in monounsaturated and polyunsaturated fatty acids (Figure). At the conclusion of

the baseline phone interview, this validation study was described and participants were invited to participate.

Participants in the validation study received a second phone interview, 2–4 weeks after the initial phone call and prior to the intervention, for

a re-administration of the DFQA followed by administration of the Fred Hutchinson Cancer Research Center FFQ (FHCRC-FFQ). The FHCRC-FFQ has been shown to have reasonable validity in minority and underserved women.²¹ A booklet on portion sizes

In an average WEEK, how many servings of these foods do you eat?					
1.	Bacon or sausage (regular)	<input type="radio"/> 0-1	<input type="radio"/> 1-2/month	<input type="radio"/> 2-3	<input type="radio"/> 4+
2.	Hot dogs or lunchmeats like bologna or salami (regular)	<input type="radio"/> 0-1		<input type="radio"/> 2-3	<input type="radio"/> 4+
3.	Hamburger, including hamburger meat in dishes like meatloaf and spaghetti	<input type="radio"/> 0-1		<input type="radio"/> 2-3	<input type="radio"/> 4+
4.	Cuts of beef or pork – like roast, chops, ribs, steak, BBQ, or ham	<input type="radio"/> 0-1		<input type="radio"/> 2-3	<input type="radio"/> 4+
5.	Fish, including tuna fish	<input type="radio"/> 2+		<input type="radio"/> 1	<input type="radio"/> 0
6.	Regular peanut butter, peanuts, or other nuts like almonds, walnuts, pecans or cashews	<input type="radio"/> 4+		<input type="radio"/> 2-3	<input type="radio"/> 0-1
In an average WEEK, how many servings of these foods do you consume?					
7.	Whole milk or regular sweet milk (including on cereal)	<input type="radio"/> 0	<input type="radio"/> 1-2/month	<input type="radio"/> 1-2	<input type="radio"/> 3+
8.	Regular cheese, plain or mixed in dishes	<input type="radio"/> 0-2		<input type="radio"/> 3-4	<input type="radio"/> 5+
9.	Regular ice cream or whipping cream	<input type="radio"/> 0		<input type="radio"/> 1-2	<input type="radio"/> 3+
10.	How many pats of margarine do you use each day ?	<input type="radio"/> 2+		<input type="radio"/> 1	<input type="radio"/> 0
10a.	Is your margarine tub, liquid or stick? [Mark all that apply.]	<input type="radio"/> liquid			<input type="radio"/> stick
11.	How many pats of butter do you use each day ?	<input type="radio"/> 0		<input type="radio"/> 1	<input type="radio"/> 2+
In an average WEEK, how many times do you eat foods fried or sautéed at home using the following:					
12a.	Olive oil, soybean or canola oil, corn oil, vegetable oil or tub/liquid margarine?	<input type="radio"/> 3+		<input type="radio"/> 1-2	<input type="radio"/> 0
12b.	Stick margarine or butter?	<input type="radio"/> 0		<input type="radio"/> 1-2	<input type="radio"/> 3+
12c.	Shortening?	<input type="radio"/> 0		<input type="radio"/> 1	<input type="radio"/> 2+
In an average WEEK, how many times do you eat food you bake or cook at home with the following:					
13a.	Olive oil, soybean or canola oil, corn oil, vegetable oil or tub/liquid margarine?	<input type="radio"/> 3+		<input type="radio"/> 1-2	<input type="radio"/> 0
13b.	Stick margarine, butter or fat back, side meat, bacon or lard?	<input type="radio"/> 0		<input type="radio"/> 1-2	<input type="radio"/> 2+
13c.	Shortening?	<input type="radio"/> 0		<input type="radio"/> 1	<input type="radio"/> 2+
14.	How many times a WEEK do you eat mayonnaise, including on sandwiches or in tuna, chicken or egg salad? (Excluding no fat mayonnaise.)	<input type="radio"/> 4+		<input type="radio"/> 2-3	<input type="radio"/> 0-1
15.	How many times a WEEK do you use salad dressing? (Excluding no fat dressings.)	<input type="radio"/> 4+		<input type="radio"/> 2-3	<input type="radio"/> 0-1

Figure. The Dietary Fat Quality Assessment (DFQA) shown has 15 questions, 10 of which are largely unchanged from the Dietary Risk Assessment (questions 1, 2, 3, 4, 5, 6, 7, 8, 10, and 11). The original DFQA had 20 questions, including details regarding salad dressing types (homemade vs store-bought; fat-free vs light vs regular). Upon analysis, the dietary fat components in the different salad dressings were similar; therefore, these questions were all combined into question 15.

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