

Assessing the relative validity of the Scottish Collaborative Group Food Frequency Questionnaire compared with 7-day weighed food records

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Food frequency questionnaires (FFQ) are used to explore diet-disease relationships in epidemiological research.⁽¹⁾ The Scottish Collaborative Group (SCG) FFQ⁽²⁾ is a self-administered, 169-item, semi-quantitative FFQ originally based on the FFQ used in the Scottish Heart Health Study⁽³⁾ which has been continuously modified and updated for use in large-scale epidemiological studies.^(4–6) In 2003, comparison of version 6.3 of the SCG FFQ with 4-day weighed food records (WFR) in 41 men and 40 women showed significantly higher intakes of energy and macronutrients by the FFQ but no significant differences in macronutrient intake expressed as % energy, and Pearson correlation coefficients >0.5 for energy adjusted fat, saturated fat, starch and NSP as well as many though not all micronutrients.⁽⁷⁾ The aim of this study was to assess the current relative validity of the SCG FFQ (version 6.6) in Scottish adults.

Secondary data analysis was undertaken using dietary data from an existing study in which 118 Scottish participants reported their usual dietary intake through the SCG FFQ followed by a 7-day WFR between September 2013 and June 2014. Ninety-five participants (45 men (25 to 65 y) and 55 women (25 to 65 y) completed both the FFQ and WFR and were eligible to participate. Energy, fibre and macronutrient intakes were examined for relative validity. The Shapiro-Wilk test was used to assess normality and nutrients found to be non-normally distributed were transformed prior to analysis. Relative agreement between the SCG FFQ and WFR was assessed through Pearson's correlation.

Nutrients	FFQ	7-day diary	p	Pearson's correlation		
	Mean (SD)	Mean (SD)		r	95% CI	p
Energy (kJ/d) [^]	9425 (2984)	6825 (1933)	<0.001	0.288	0.089, 0.476	0.005
% Energy from protein [^]	17 (3)	17 (3)	0.479	0.580	0.483, 0.876	<0.001
% Energy from carbohydrates	46 (5)	46 (7)	0.855	0.700	0.733, 1.123	<0.001
% Energy from fat	33 (4)	33 (6)	0.958	0.564	0.591, 1.100	<0.001
% Energy from saturated fat	13 (3)	12 (3)	0.007	0.564	0.457, 0.852	<0.001
NSP (g/d) [^]	19.5 (8.5)	15.5 (5.3)	<0.001	0.348	0.138, 0.480	0.001

[^] For log_e transformed variables [median (SD) reported]

Percent energy from protein (17%), percent energy from carbohydrates (46%), and percent energy from fat (33%) were comparable when examining nutrient intakes from the SCG FFQ and 7-day WFR, while energy, percent energy from saturated fat and fibre were significantly different. Pearson's correlation coefficients for WFR-FFQ energy and macronutrient differences ranged between 0.288 for total energy intake and 0.700 for percentage energy from carbohydrates. All macronutrients (expressed as % energy) examined scored a correlation coefficient above 0.5.

Compared to a 7-day WFR, the SCG FFQ (version 6.6) is suitable for estimating macronutrient intakes, expressed as % energy, and for ranking intakes of these variables in a large-scale study, but not for estimating or ranking intakes of energy or NSP.

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