

## Development and validation of a semi-quantitative FFQ to assess dietary energy and nutrient intakes in a prospective cohort study

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Diet related non-communicable diseases are blooming up in Sri Lanka mainly due to unhealthy dietary patterns and sedentary lifestyle. Healthy dietary habits are considered an important component in prevention, management and treatment of chronic diseases such as hypercholesterolaemia, hypertension, diabetes and obesity<sup>(1)</sup>. It has been shown that validated semi-quantitative FFQ can be used to estimate dietary intake of food and nutrients<sup>(2)</sup>. The aim of this study was to develop and validate a semi-quantitative FFQ to assess dietary energy and nutrient intakes which will be used in a prospective cohort study designed to determine the association of dietary intakes with hypertension, diabetes and hyperlipidaemia.

We developed an interviewer-administered semi-quantitative FFQ consisted of seventy-six food items commonly consumed by middle-class population in Sri Lanka. It was validated against a self-administered 5-d- diet records using seventy-one individuals (forty-eight females and twenty-three males) aged 34–65 years living in an area where the proposed prospective study will be carried out. Energy and other nutrient intake data from both dietary methods were derived from computerised food composition data base. Pearson correlation coefficients (*r*) were derived for relative validity at the individual level. Later, original FFQ was revised to a shorter version with forty-three food items by eliminating least consumed food sources.

We found significant (*P*<0.05) positive correlations between the final FFQ and 5-d-diet records for energy (*r* = 0.41), protein (*r* = 0.52), carbohydrate (*r* = 0.34), Ca (*r* = 0.55), Zn (*r* = 0.28), Cu (*r* = 0.39) and retinol (*r* = 0.32) (Table). However, the absolute intakes of energy, protein, carbohydrates, Mg, Zn, Cu, Vitamin C, vitamin D and % energy from macronutrients estimated using FFQ were significantly (*P*<0.05) different from those of 5-d-diet records.

Energy/Nutrient	Intake – 5-d-diet diary			Intake – FFQ			<i>r</i>
	Median	Mean	SD	Median	Mean	SD	
Energy (kcal)	1683.0	1746.8	426.5	2557.0	2794.0†	961.3	0.41*
Protein (g)	51.5	52.6	15.1	64.6	66.8†	22.3	0.52*
Fat (g)	50.8	49.9	13.8	43.1	47.5	19.8	0.20
Carbohydrate (g)	267.8	289.5	81.2	522.1	559.9†	205.5	0.34*
Ca (mg)	506.4	552.2	250.0	481.0	550.8	251.2	0.55*
Mg (mg)	144.0	155.8	59.6	511.4	590.6†	239.0	0.20
Fe (mg)	16.2	18.7	8.5	17.5	18.1	6.3	0.21
Zn (mg)	5.6	5.5	1.6	12.9	14.1†	5.4	0.28*
Cu (mg)	1.0	1.1	0.4	2.5	2.7†	1.0	0.39*
Vitamin C (mg)	33.0	39.0	28.0	79.0	58.2†	33.3	0.08
Retinol Equivalents (µg)	344.8	348.5	153.1	359.0	376.2	177.1	0.32*
Vitamin D (µg)	7.8	10.0	8.9	1.8	2.2†	2.4	0.23
%energy from fat	25.9	25.6	4.47	14.4	15.5†	4.6	-0.06
%energy from protein	11.9	12.2	2.4	9.4	9.6†	1.1	0.18
%energy from carbohydrate	61.5	62.0	4.8	75.4	74.8†	5.1	-0.03

\* Significant correlation between FFQ and 5-d-diet diary: *P*<0.05.

† Significant difference between FFQ & 5-d-diet diary by paired *t*-test: *P*<0.001.

In conclusion, developed FFQ demonstrated good relative validity in the estimation of intake of energy and some nutrients. FFQ should be used with caution in estimating absolute intake of macronutrients.

1. Segovia-Siapco G, Singh P, Jaceldo-Siegl K *et al.* (2007) *Public Health Nutr* **10**, 177–184.
2. Willett W (1998) *Nutritional Epidemiology*, 2nd ed. New York: Oxford University Press.