

Author's response to reviews

Title: Development of a semi-quantitative food frequency questionnaire for use in United Arab Emirates and Kuwait based on local foods

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Author's response to reviews:

Deputy-Editor-in-Chief, Nutrition J

Dear Dr. Kumagai,

Thank you for the constructive comments and for providing us the opportunity to respond to the concerns. We are submitting a revised (and shortened) manuscript, and a point by point response to the critiques of the previous draft. The manuscript is much improved as a result of the constructive suggestions. When doing a literature search we noticed that there were few papers describing the development of FFQs and food composition databases in sufficient detail. If the development and validation were grouped together in one manuscript the focus was on the validation. As we could not readily find the level of detail we needed to be able to develop the FFQ and food composition database, I had to travel to Boston to share that experience. We therefore urge that you consider this manuscript on development of the FFQ and food composition database. Our validation study is still underway and we will surely submit it when it is complete.

Sincerely yours
Mahshid Dehghan

Editor's comments

1. Our major concern is that this method of SFFQ has not yet been validated. We wish you to add the results of validation study currently running.

Validation studies of Food frequency questionnaires (FFQs) are widely reported in the literature, but there are only a few papers providing details of the development of FFQs and supporting nutritional databases. Even though the principles of FFQ development are well described in textbooks, the application of those principles in the field may differ from study to study. Likewise, there are few reports in the literature describing experiences of development of nutrient composition databases. The process of FFQ and nutrient food composition database development we describe may benefit other investigators developing similar instruments. If the development and validation of FFQs are combined into a single paper, the validation section is inevitably larger and there is less emphasis on development. We therefore urge that the development and validation be considered in separate papers. The validation study is underway and we will submit that manuscript when it is complete

2. We also ask you to re-organize the description of methods and results for better readability. We have shortened the manuscript and edited it for better readability.

Comments from reviewer 1,

1. The background should be short and focused on the main idea which is in this case the importance of developing FFQ for the studied population and the methodology used to develop a population specific FFQ. We have substantially shortened the background section and mainly focused on the importance of the FFQ development for Arab population in UAE and Kuwait (Page 5).

2. The method of developing FFQ based on a population survey is correct although the sample size was too small to represent the dietary intake of such a large age range of the population.

We apologize for not being clear about the sample size. Our sample size was 326; of those 126 provided 24-hour diet recall data, and 200 filled out the long-FFQ. We have clarified this in the revised document (page 5).

The food list was not prepared solely on the basis of the 24-hour diet recalls. We supplemented it by consulting with experienced dietitians and used the most popular cookbook, as suggested by Willett (1998) (page 6). The long FFQ that we pre-tested had blank spaces for people to add foods that they ate frequently but were not on the list. The final SFFQ contained the changes made as a result of the pre-test. Moreover, we approached a diverse population, in UAE and Kuwait. Even though these countries share the same foods we did this to get maximum variability in diet.

3. My main concern is the method of developing the FFQ used in this study. The method used for this study does not meet current methodology requirements. The current methods for developing FFQ was used in developing FFQ for the EPIC study for example (1) a study that was focused on diet and cancer in several European countries and other more recent studies (2). The author cite Harvard's questionnaire frequently in his writing although the Harvard questionnaire was developed in the eighties and the list of foods was based on foods that contribute to the variability between people. The main idea of the list of foods included in a FFQ is to include the main contributors for the variability between people and not the contributors for absolute intake, a much longer list of foods (3). Since FFQ is used mainly in cohort or case control studies the main interest is to determine relative risk and odds ratio thus ranking the exposure is the main purpose of the questionnaire.

We agree with the reviewer that the FFQ is a useful tool to rank people by usual intake of foods and not estimate absolute intake. That is our aim of developing this FFQ. To develop the EPIC-Oxford and Norfolk arm FFQ, Bingham and co-workers modified the Harvard FFQ (Rimm et al., 1992) and changed American food names to their British equivalent (Welch et al., 2005). We examined methods for the development of FFQs for all the major cohorts including EPIC. However, we quoted the Willett FFQ because it was the first study to issue this method: "The most commonly used instrument in cohort studies of diet has been the food frequency questionnaire (FFQ) of Willett or adaptations of it" (Jakes et al., 2004) Because we are not aware of any validated FFQ in the Middle East and the Persian Gulf region, we developed the food list based on an open-ended data suggested by Willett (1998).

4. The method of assigning nutritional values for each line by using one food item may be reasonably accurate although recently it was shown by Subar et al (4) that using weighted means of the foods comprising each line may add accuracy to the study.

We assigned the average portion size for each food items as suggested by Willett (1998) and Bingham (2001). As the reviewer correctly stated this method is reasonably accurate to estimate intake. As we administered FFQ and 24-hour dietary recalls in different people we are not able to make meaningful comparisons at this stage. We thank the reviewer for pointing out an alternative method for nutrient estimation. We will try out both methods for to estimate nutrients in the validation study. Our purpose of presenting nutrient intake data at this stage is to demonstrate face validity of the FFQ, by showing that the estimates were reasonable.

Comments from reviewer 2,

This paper describes step-by step, in a textbook format, the development of a semi quantitative food frequency questionnaire (FFQ) to be used in Kuwait and the United Arab Emirates. The samples do not attempt and are not representative of either population (mostly women and largely University educated). Thus the description of development of FFQ is methodologically satisfactory, although of modest interest, whereas the information about dietary habits in the two countries is not directly interpretable (although it conveys some information about local dietary habits).

Our goal in taking this sample was to capture the range of foods commonly eaten by the Arab population. As our sample included more women than men, data from the 24hr dietary recall alone may not have captured the foods commonly eaten by men. We overcame this potential limitation by adding foods that were more commonly eaten by men in these countries based on the experience of local dieticians, and local recipe books. If we were unsure about whether to include or exclude a food we erred on the side of inclusion at the stage of preparation of food list. We then pre-tested this long list in Arab populations in UAE and Kuwait. At this stage we then removed foods that were not commonly consumed. The education level of women in our sample were similar to the national average (the *Gross Tertiary School Enrollment among Kuwaiti men is 86% and Kuwaiti women 81%, we expected to have a high number of educated women among our sample).

A drawback of the paper is that it is rather long for the information contained, particularly because no validation is provided. Shortening the paper by about 1/3 would improve its readability.

We thank the reviewer for making this constructive suggestion; we have shortened the manuscript extensively.

A typo. Results, second paragraph, line 20: It is tables 3 and 4, not tables 4 and 5
The typo is corrected in those tables.

* Gross Tertiary School Enrollment is defined as the total enrollment, regardless of age, expressed as a percentage of the official school-age population for a tertiary level of education. Tertiary education provides the level of education required for entry into an advanced research program or a profession with high skills requirements. http://earthtrends.wri.org/searchable_db/variablenotes_static.cfm?varid=423&themeid=4

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3. Rupert W Jakes, Nicholas E Day, Robert Luben, Ailsa Welch, Sheila Bingham, Jo Mitchell, Susie Hennings, Kirsten Rennie, and Nicholas J Wareham. Adjusting for energy intake--what measure to use in nutritional epidemiological studies? *Int J Epidemiol.* 2004 Dec;33(6):1382-6.
4. Willett, W., *Nutritional epidemiology.* New York: Oxford University Press. Second edition, 1998: 484-496.
5. Bingham SA, Welch AA, McTaggart A, Mulligan AA, Runswick SA, Luben R, Oakes S, Khaw KT, Wareham N, Day NE. Nutritional methods in the European Prospective Investigation of Cancer in Norfolk. *Public Health, Nutr.* 2001 Jun;4(3):847-58.