

Opinion

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Food Questionnaires and Dietary Recalls: The Challenges of Assessing Food Consumption to Identify Poor Nutrition in a Changing World

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Assessing food consumption is challenging. Often, researchers speculate as to what is the best way to gather information about people's food intake. There are many factors intertwined regarding food consumption some of which include: low or high income, nutrition knowledge, food availability and access to food.¹

Diet has changed in the last decades, emerging as a nutrition transition process which is consequence of two historic processes of change, clearly explained by Popkin et al.² the demographic transition – the shift from a pattern of high fertility to one of low fertility and mortality and the migratory movements from rural to urban settings, and the epidemiologic transition process, meaning the change from a pattern of high prevalence of infectious diseases, associated to under nutrition and poor environmental sanitation, to one of high prevalence of chronic diseases associated to urban lifestyles.² These changes resulted in changes in physical activity and diet patterns, and one of the most relevant changes within the diet is the poor consumption of fruits and vegetables.³

Fruit and vegetables consumption has been reported to be an important factor for the prevention of chronic diseases related to nutrition,⁴ in consequence there is much epidemiologic interest for obtaining accurate estimates of mean or median intakes and (when possible) distribution of consumption of these foods.⁵ When a particular dietary pattern lacks these foods because they are expensive, and are difficult to access for the poorest segments of population, or because nutrition knowledge is low,⁶ it is important to introduce some actions to improve this situation.

In order to examine the dietary intake of the population adequacy, it is important to have validated tools particularly for assessing the consumption of foods that play key roles for preventing diseases in the long term.⁷ It is known that many nutrients such as vitamins and minerals are present in fruits and vegetables, giving these foods relevance to maintaining a healthy status for individuals. This fact highlights the significance of assessing the intake of such foods.⁸

The review of the dietary pattern and the detailed analysis of other nutrient consumption of populations are very important to approach the study of the relationship between nutrition and disease.⁹ Dietary pattern analysis is, according to some authors a better way to examine the effect of overall diet on diseases related to nutrition, and might well give some insight about the consumption of groups of food.⁹ When addressing intake details, other methodologies are to be used.

Differences between methodologies to assess food intake exist, while Food Frequency Questionnaires (FFQ) are designed to assess usual intakes, 24-four hour dietary recalls, on the other hand, can give more accurate nutrition information concerning the previous day recall, it is more expensive to administer and require a high level of cooperation and literacy.¹⁰

Whether traditional tools such FFQ or 24 hour recall are used, health care practitioners, epidemiologists and ultimately policy makers, should realize that there may be errors due to memory lapses of participants, misinterpretation by interviewers, poor nutrition education knowledge and the lack of interest by participants in responding to long questionnaires.¹¹ Still, researchers desire to assess appropriately these populations and each individual's food intake patterns in order to improve overall nutrition (Table 1), overcome nutritional deficiencies and control the chronic non communicable diseases which are epidemic around the world.¹²

The gold standard for assessing food and beverage intake in humans has been the 24 hour recall, however this method not always fits into a nutrition study project, because it requires training, it is time consuming, its analysis is laborious and depending on the circumstances can be expensive. On the other hand, to leave out this tool can be risky if individual needs are to be considered.¹¹

In general, identifying population's needs has been challenging since many times food consumption assessment is skipped due to lack of time for engaging in the long and complicated process of questionnaires and recalls, particularly for policy makers that usually request fast results and need short term impact.

The initiative for developing shorter tools to identify specific food and nutrition data, have been taken in the last decades by several institutions over the world including the 5 a Day for Better Health Program,⁸ that requires efficient tools to be used to track changes in fruit and vegetables intakes.

As time has progressed, the evaluation of food consumption, coupled with nutritional interventions developed to eradicate existing nutrient deficiencies, has been fraught with difficulty. Even workers on tried intervention programs concur that what is being done is enough, as anything else tried in comparison has complications.¹⁶ Therefore, analyzing in detail the

impact of an intervention, an education program or a policy, or what to ask or how to ask, and how much to ask, all becomes relevant.

As expressed by Popkin et al.² and Drenowky et al.¹⁴ changing eating patterns are important to identify, as large shifts have occurred toward diets high in saturated fat, sugar and refined foods but low in fiber, vitamins and minerals, many of which are present in fruit and vegetables.^{2,17} In consequence, ensuring that the population is consuming enough fresh produce becomes relevant, thus catalyzing fruits and vegetables for the many health benefits of individuals such as preventing inflammation, obesity and type 2 diabetes.^{4,18}

Ultimately, one can observe that nutrition risk screening tools are not routinely implemented in many environments. Communities without food consumption surveys, malnourished hospitalized children and adults and countries without nationally representative nutrition studies still exist. The benefit of tools largely proven to be accurate, short, easy to perform and less expensive, are to be included so nutritional and food consumption data can be available, and might give at least a more accurate idea of the real food and nutrient needs of the population.¹⁹ A recent study conducted in pediatric hospitalized patients shows the relevance to implement screening tools for recognizing malnutrition, and the use of a Single Question (SQ), performed adequately to identify nutrition risk on these patients.¹⁹

In a similar manner, single questions and short questionnaires have been developed for appropriate screening of fruits and vegetables, due to the relevance of these foods for the health of populations. Comparison and validation of short tools such as the one conducted by Cook et al.²⁰ supports its use to establish population needs. The fact Cook et al. found that using a SQ for assessing fruit consumption, a SQ for vegetable consumption and a 5 item Vegetable Fruit Questionnaire (VFQ) could replace a longer FFQ for estimation of population intakes of these foods and for screening its adequacy is an interesting finding, and is valuable and give some alternatives to the tradi-

24 hour dietary recall	Food Frequency Questionnaire (FFQ)
Take large amounts of time to apply ¹¹	Less time consuming ¹¹
Gives information about the food intake of the previous 24 hours ¹³	Can be for specific foods such as identifying beverage or fruit intake ^{20,21}
Better for assessing individual intake at defined periods ¹³	Better for assessing usual intake ¹⁰
Limited use in large prospective studies ¹³	Better for using in large prospective studies ¹³
Require special training for interviewing ¹¹	Better tool to be self-administered ¹¹
Under and over reporting of some foods ¹⁴	Can give higher estimates of the intake of some foods particularly of those socially acceptable foods ¹¹
It is suggested that two 24 h recalls are made and the 5 pass method is the result of reducing the underreporting bias ¹⁵	Depends of how many food items are being questioned and how are the frequency required ¹⁰

Table 1: Comparison between 24 hour dietary recall and Food Frequency Questionnaire.

tional, more complex tools.

The use of a short question to be answered can be a useful tool to identify whether a certain food is being consumed by a population at risk, and give a closer idea of a particular group of food intake that should be promoted, such as a type of milk or fruit.²¹

When conducting studies that aim to identify the extent to which a population is deficient in nutrients mainly found in fruit and veggies, such as antioxidants, these shorter tools can be of much aid in attaining results in a faster way, thus allowing the taking of public actions in a reasonable time. Also, when weighing the pros and cons of conducting nutrition surveys and exploring methodologies it is important to suggest the use of short, evidence based tools that proved efficient and safe for identifying populations at risk.

In populations of the world that are undergoing the nutritional and epidemiologic transition to more caloric diets and adopting a sedentary behavior, fewer fruits and vegetables consumption is expected,²² it is therefore imperative that a methodological effort is made in order to quantify the extent of this change on the diet and make it a priority within public actions.

Including SQ and shorter versions of FFQ as part of the assessing consumption of foods and later monitoring and evaluation of nutrition programs would give advantages for the follow up, giving the perspective of where the interventions for health promotion should be.

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