



Dietary Assessment Methods in Surveillance Systems Targeted to Adults: A Literature Review

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Abstract

Accurate and reliable evaluation of dietary consumption is essential for understanding individual dietary profiles. Proper dietary practices should provide sufficient amounts of both macronutrients and micronutrients for leading a healthy life. Choosing the best dietary assessment method for a certain objective leads to greater evidence for effective nutrition projects, policies, and programs. This review provides a clear understanding of dietary diversity assessment methods and the problems associated with choosing the best method. The resource guide aims to improve the quality and accuracy of nutrition information and provides a description of its applications, validity, strengths, and limitations. The databases searched for relevant papers for this review were Science Direct, Google Scholar, PubMed, Hindawi, Web of Science, Cochrane Library, etc. The review focused on collecting data from the last ten years of published articles, and duplicate papers were excluded from the database. Assessment methods described and compared in this study were the 24-hour recall method, food frequency questionnaires (FFQs), food records (FRs), quantitative food frequency questionnaires (QFFQs), non-quantitative food frequency questionnaires (Non-QFFQs), semi-quantitative food frequency questionnaires (SQFFQs), weighed FRs, and estimated FRs. In conclusion, this study highlights the need for a surveillance system for adults that collects comprehensive dietary information using standardized techniques and minimizes bias. This review's extensive information can help national authorities choose appropriate protocols for their own dietary assessment surveys.

Keywords: Dietary Diversity; Assessment Method; Survey; National Policy

Introduction

The consumption of food by an individual during a specified period is referred to as dietary diversity [1]. Balanced dietary diversity is necessary to ensure sufficient nourishment for individuals that is vital for growth, maturation, reproduction, and maintaining a dynamic and wholesome lifestyle [2]. Diet-related disorders are often exposed to individuals due to poor dietary diversity, low intake of nutrient-dense foods that support healthy diets,

hygiene, and a sedentary lifestyle [3]. Proper nourishment constitutes a fundamental component of a robust way of life and the prevention of illness. The insufficiency of macronutrients and micronutrient consumption or the absence of variation in dietary choices presents a worldwide burden, and it arises directly from the incapacity to procure poor dietary diversity [4].

Consequently, it is imperative to prioritize the undertaking of gathering, monitoring, and assessing dietary diversity

and patterns. This should be executed through surveillance systems, which ought to be established upon meticulous selection of diverse dietary and no dietary indicators pertaining to the nutritional status of the community. These surveillance systems will potentially serve as a compass for directing nutritional policies and devising action plans [5]. The precise evaluation of dietary consumption in adults is a formidable task, necessitating the careful consideration of a multitude of advantages, disadvantages, and pragmatic factors associated with each approach employed in dietary assessment [6].

The method used for evaluating dietary diversity indicates the methodology's capacity to yield consistent outcomes upon re-administration at a subsequent time period and given comparable conditions. The purpose of this review is to explore the back and forth of the available nutrition surveillance systems related to dietary assessment and identify on going multinational surveillance systems assessing dietary diversity and nutrition targeted at adults.

Methodology

Literature Review

An extensive literature review was conducted to find the related original research and review papers. The databases searched for relevant papers were Science Direct, Google Scholar, PubMed, Hindawi, Web of Science, Cochrane Library, etc. Some major keywords that were used during

the literature review were 'nutrition', 'nutritional diet', 'dietary consumption', 'dietary habits', 'dietary behaviours', 'surveillance', 'surveillance systems', 'surveys', etc. In addition, this mini-review included highly cited research articles published in multiple quality journals. Papers from predatory journals as well as papers focusing on other topics were excluded. The review focused on collecting data from the last ten years of published articles, and duplicate papers were excluded from the database. Information was also collected through the internet websites of official institutions, such as ministries, governmental associations, international commissions, and institutions in the field of nutrition.

Result and Discussion

Different dietary diversity methods, strengths, and limitations are illustrated in Table 1. The following two crucial elements must be taken into account when evaluating intake techniques in low-income populations: (1) defining or determining what constitutes low income and (2) selecting the most suitable intake assessment approach to use [7]. The selection of food items in a catalog is influenced to some extent by empirical evidence and to some extent by the exercise of scientific discernment [8]. The chosen food items may be employed to encompass the principal origins of energy and/or nutrients ingested by the cohort under investigation. Appropriate dietary practice can be an effective solution for some non communicable diseases [3], as can the continuous supply of proper nutrition.

Dietary method	Characteristics	Execution	Limitations	Strengths
24-hour recall method [3], [9]	Interviews were conducted in which participants were asked to recall all foods, food groups, and drinks consumed in the previous 24 hours. The amount or size of the food consumed was identified using cups, glasses, and bowls.	The estimation of quantities was performed by a proficient interviewer employing food models, food photograph books, and household measurements.	The reliance on the memory of participants and their capacity to recall the sizes of portions may result in bias in the recall process. Furthermore, it is possible that the collected data may not accurately reflect the typical dietary intake of the participants.	A rapid approach to evaluating typical consumption. Appropriate for implementation in societies with limited literacy capacities. Reduced participant burden. Favorable rate of participation. Moderately diminished expenses associated with administration.
Food frequency questionnaires (FFQs)[10], [11]	A compilation of inquiries concerning sustenance to which the individual provides answers by documenting the frequencies (numerical occurrences) and quantities (proportions) of the foods or food groups ingested on a daily, weekly, or monthly basis.	Either independently or under the interviewer's supervision.	Decreased precision in calculating food consumption amounts dependence on the participant's memory. Cultural sensitivity during reporting.	Good response rate from participants and inexpensive. Accurate depiction of typical food consumption. Suitable for populations with low literacy rates.

Food records (FRs) [12], [13]	The participant records all foods, beverages, and food groups consumed over the mentioned period of time.	Non-consecutive random days or consecutive days are suggested.	The burden on participants is elevated by this methodology.	Errors resulting from reliance on the participant's memory and the precision of recalling portion sizes are reduced using both of the subsequent approaches.
QFFQs [14], [15]	The measurements of food and drink portions are expressed in grams or milliliters.	Used to estimate quantities by a trained interviewer using food models and/or food photo books.	Decreased precision in calculating food consumption amounts. Dependence on the participant's memory. Cultural sensitivity during reporting.	The best representation of the estimated FFQ portion sizes.
Non-QFFQs [14]	Only the frequency of consumption is noted, not the number of portions.	Used to estimate quantities by a trained interviewer using food models and/or food photo books.	There is no information about the amount of food or serving size.	The least number of FFQs answered by respondents.
SQFFQs [16]	The average portion sizes of meals and beverages are measured as small, medium, or large portions.	Used to estimate quantities by a trained interviewer using food models and/or food photo books.	Decreased precision in calculating food consumption amounts. Dependence on the participant's memory. Cultural sensitivity during reporting.	Simpler to conduct than QFFQs and fewer respondent burdens.
Weighed FRs [17], [18]	Food and beverage amounts are precisely measured in grams.	On a food scale, the participant weighs all items before consuming them.	The participant may alter their regular food and drink intakes to reduce or streamline the process of weighing food and drink items.	Record accurate amounts of meals and beverages consumed.
Estimated FRs [17], [18]	Estimated food and beverage consumption is based on household measurements, food models, and/or portion photos. Measured as a gram unit.	The participant assesses food and beverage servings before eating.	Conversion to grams can be error-prone.	Less costly. There is less subject burden than in the weighed FRs.

Table 1: The description of various dietary assessment methods.

Note: Quantitative food frequency questionnaire (QFFQs), Non-quantitative food frequency questionnaire (Non-QFFQs), Semi-quantitative food frequency questionnaire (SQFFQs).

Conclusion

This inventory will contribute to the identification of needs and gaps in this area to guide the design and implementation of improved dietary multinational systems to evaluate nutritional prevention strategies suitable for adults.

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