



Evaluation of validated food quantification aids for dietary assessment: A systematic review

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Each dietary assessment method has its own shortcomings, especially regarding food quantification and portion size estimation⁽¹⁾. The chief limitations are the absence or inappropriate measure of absolute or relative validity, reliability, or feasibility of portion size estimation aids⁽²⁾. These limitations can lead to errors in the portion size estimations. This systematic review aims to identify validated food quantification and portion size aids for dietary data collection in dietary assessment tools and appraise the quality of the validation.

Four electronic databases (PubMed, Web of Science, Scopus, and EMBASE) were searched from inception until December 2022. The search strategy used combinations of synonyms related to food quantification or portion size aids, dietary assessment methods, biomarker, and validation or comparison-related outcomes. Peer-reviewed original articles of studies describing validation or comparability, of food quantification and portion size aids were included. Study quality assessment was conducted using a quality scoring tool developed for this study following previously published quality scoring systems.

A total of 16302 abstracts were screened, of which 332 underwent full-text review. Data were extracted from 70 articles carried out in 33 countries between 1992–2022. Out of 87 food quantification aids, 46 (53%) were printed, 33 (38%) were digital, and 8 (9%) were presented in both formats. About half (54%) of the aids were standardized food photographs, 14% were food images on app, 12% were household measures, 6% were food models, 5% were photographs taken by participants, 1% were food shapes, while others were 8%. The majority (63%) of studies used weighted portions as the comparator, 15% used actual food volume/food portion, 8% used standard food model/replica, 8% used standard photograph, 5% used standard measuring tools, and 1% used 24-hour recall. The quality of the validation of the methods was variable.

This systematic review revealed that standardized food photographs were the most validated food quantification aid, and this is similar to previous findings⁽³⁾. However, the methods and quality of the validation in the identified studies were inconsistent.

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