

# Implementation of evidence-based nutritional management in primary health care settings: a systematic scoping review

Nara Letícia Zandonadi de Oliveira<sup>ID A,D</sup>, Marina Peduzzi<sup>A</sup>,  
Heloise Lima Fernandes Agreli<sup>B</sup> and Karen dos Santos Matsumoto<sup>C</sup>

<sup>A</sup>University of Sao Paulo, School of Nursing, Department of Professional Orientation, Avenida Dr Enéas de Carvalho Aguiar, 419, São Paulo, SP, Brazil.

<sup>B</sup>Center for Work, Technology and Organisation, Emlyon Business School, 15 Boulevard Diderot, F-75012 Paris, France.

<sup>C</sup>State University of Rio de Janeiro, Social Medicine Institute, Rua São Francisco Xavier, 524, Rio de Janeiro, RJ, Brazil.

<sup>D</sup>Corresponding author. Email: narale.zandonadi@gmail.com

**Abstract.** Scientific evidence is used to inform clinical nutritional guidelines in order to prevent diseases and promote health. However, little is known about the process of implementing evidence-based clinical nutritional guidelines in health services. This scoping review aims to map the steps in the implementation of evidence-based nutritional management within primary health care, as well as the facilitators and barriers to implementation. Electronic databases and the grey literature were searched for original studies on the implementation of evidence-based dietary recommendations and/or nutritional counselling in primary health care settings conducted by health practitioners. Studies were selected by independent reviewers. Extracted data were analysed and grouped into thematic categories and are presented in a narrative synthesis. In all, 26 studies were included. A review of the studies demonstrated four steps in the process of implementing evidence-based nutritional management in primary care: (1) acknowledging health needs in the catchment area and determining the characteristics of services and health professionals; (2) developing continuing education aimed at practitioners; (3) integrating nutritional management into interprofessional practice; and (4) adapting the interventions using a patient-centred care approach. The predominant facilitators were providers' pre-intervention training and the provision of support materials. Barriers included time constraints, a lack of resources and an incompatibility of the interventions with living conditions and patients' health needs.

**Keywords:** evidence-based practice, implementation science.

Received 27 November 2020, accepted 22 August 2021, published online 15 December 2021

## Introduction

One in five deaths worldwide (estimated at 11 million deaths in 2017) is associated with eating habits (GBD 2017 Diet Collaborators 2019). The relationship between inappropriate eating habits and chronic non-communicable diseases has been extensively investigated (Micha *et al.* 2017; World Cancer Research Fund 2018), producing evidence that suggests that the high consumption of certain foods, including ultra-processed foods, contributes to diseases such as diabetes, colorectal cancer and ischaemic heart disease.

Despite the significant evidence that relatively small changes in eating habits may significantly improve an individual's health, primary healthcare (PHC) professionals frequently cite deficiencies in training as to why they do not implement evidence-based nutritional management (Blonstein *et al.* 2013). Only a minority feel prepared to provide nutritional

management advice following clinical protocols (The Counterweight Project Team 2004; Brown and Psarou 2008).

PHC represents the entry point for individuals, families and communities into health services, playing a central role in the quality of health care and the promotion of evidence-based dietary recommendations (World Health Organization (WHO) 2008). Considering this key role, the aim of this scoping review was to better understand how healthcare professionals in PHC settings have implemented evidence-based nutritional management. This review focuses on the barriers and facilitators to effective implementation. Two research questions guided this scoping review: (1) what are the steps in the implementation of evidence-based nutritional management in primary healthcare settings; and (2) what are the facilitators and barriers to effective implementation?

By collecting and organising study results, a scoping review allows existing evidence to be mapped, providing valuable

information on the different ways in which evidence-based nutritional management is being implemented in PHC (Tricco *et al.* 2018).

## Methods

This study chose the scoping review methodology proposed by the Joanna Briggs Institute (JBI) using an approved and published protocol (Oliveira *et al.* 2018). The scoping review methodology used by the JBI is based on previous scoping reviews, such as that of Arksey and O'Malley (2005).

### Inclusion and exclusion criteria

To be eligible for inclusion in this study, articles had to be: original scientific articles (using any methodology) or published in the grey literature; written in Spanish, Portuguese or English; about the implementation of evidence-based dietary recommendations and/or nutritional counselling; performed in PHC settings; and implemented by health practitioners, regardless of education level.

Studies that only pointed out dietary recommendations to be followed for the prevention or treatment of a particular pathology and studies that analysed only the preceding steps of nutritional management, such as nutritional assessment, were excluded.

### Search strategy

Seven electronic databases (PubMed, CINAHL, EMBASE, LILACS, PsycINFO, ERIC and SCOPUS) and three sources of grey literature (Catálogo de Teses e Dissertações (CAPES), the RedeNutri portal of the Brazilian Government and Open Access Theses and Dissertations (OATD)) were searched for articles from the start date of each database up to July 2018. The databases were searched using a combination of indexed terms and/or keywords referring to 'nutritional management', 'evidence-based practice' and 'PHC', with the exception of the RedeNutri portal, where the research was conducted through the 'Experiences' tab. The indexed terms and keywords used in the searches of the electronic databases and sources of grey literature are presented in Table 1. The final combination of indexed terms and/or keywords used in searches of an electronic database (PubMed) and a source of grey literature (CAPES) is presented in Table 2.

### Study selection

First, three reviewers (NLZO, HLFA and KSS) individually applied the inclusion criteria to all titles and abstracts of publications retrieved from the databases. Then, the titles and abstracts of studies classified as 'included' or 'uncertain' were reviewed by two different reviewers (NLZO and MP), with any disagreements were resolved by consensus. Finally, the reference lists of included studies were manually searched to identify any other publications. During the review process, there was no formal assessment performed of the quality of the included studies because of the purpose of scoping reviews (Tricco *et al.* 2018).

### Data extraction

A data chart form was used to extract standard basic information (article title, authors, year of publication, country of origin,

study design) and relevant findings related to the objectives of the review: interventions/programs linked to evidence-based nutritional management, context and stages of the implementation process, health professionals involved and barriers and facilitators for implementation.

### Data synthesis

A synthesis of the collected data is presented in a narrative summary focused on the objectives of the review, with the addition of tables and numerical descriptions to show the number and distribution of studies included in the review (years of publication and countries of origin).

### Ethics approval

Because this study was a scoping review based on previously published studies, it did not involve direct participation by humans or animals and, as such, was exempt from approval by a research ethics committee.

## Results

The search identified 5843 records from databases and the grey literature, with a further 1034 identified from the references lists. After excluding duplicates and unavailable records, 5809 titles and abstracts were evaluated. Of these, 5570 articles that did not meet the selection criteria were removed; 239 studies were checked by two separate reviewers (NLZO and HLFA), with 41 selected to be read in full. Of those, 15 were discarded (three not available as full text; 12 not eligible for inclusion after reading of the full text), resulting in the final selection of 26 studies (Fig. 1; for a list of the studies included, see Table 3).

Of the 26 studies included, 23 were written in English and published between 2004 and 2017, with 11 studies published between 2015 and 2017. Fifty per cent of the studies came from the Americas, with the largest number of publications (10 studies) coming from the US. The PHC services or community services studied were in urban, rural and/or designated Indigenous territories.

The professionals most frequently involved in the implementation of evidence-based nutritional management were GPs or family physicians (60% of studies), followed by nurses. Nutritionists had a key function supervising and supporting the implementation of nutritional management, even though they did not have the same role as direct agents of the interventions and programs.

Studies of the implementation of evidence-based nutritional management included in this review were classified into five themes related to food and nutrition, namely: (1) breastfeeding (Labarere *et al.* 2005; Bettinelli *et al.* 2012; Corriveau *et al.* 2013; Hernández-Aguilar *et al.* 2014; Fontoura *et al.* 2015; Mueller 2015; Schwartz *et al.* 2015; Baerug *et al.* 2016; Aguiar *et al.* 2017; Souza *et al.* 2017a); (2) infant feeding (Ewing *et al.* 2009; Inglis *et al.* 2010; Sargent 2011; Shaikh *et al.* 2014; Cloutier *et al.* 2015; Gabrielli *et al.* 2017); (3) weight control in adults – overweight/obesity (The Counterweight Project Team 2004; Huseinovic *et al.* 2016; Little *et al.* 2016); (4) control of alcohol consumption (Beich *et al.* 2007; Clifford and Shakeshaft 2011; Ornstein *et al.* 2013); and (5) the care of diabetic patients (Glasgow *et al.* 2004; Vachon *et al.* 2007; Garza *et al.* 2017). The

**Table 1. Search strategy for electronic databases and the grey literature**

| Database                         | Nutritional management                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Evidence-based practice                                                                                                                                                          | Primary health care |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| PubMed: indexed terms (MeSH)     | Diet<br>Diet Therapy<br>diet therapy [subheading]<br>Diet, Food, and Nutrition<br>Dietary Services<br>Dietetics<br>Eating<br>Feeding and Eating Disorders<br>Feeding Behaviour<br>Food<br>Nutrition Assessment<br>Nutrition Disorders<br>Nutrition Therapy<br>Nutritional and Metabolic Diseases<br>Nutritional Physiological Phenomena<br>Nutritional Requirements<br>Nutritional Sciences<br>Nutritional Status                                                                          | Evidence-Based Practice<br>Patient Care Bundles                                                                                                                                  | Primary Health Care |
| PubMed: Keywords                 | Applied Nutrition Programs<br>Nutri*<br>Diet*<br>Eat*<br>Feed*                                                                                                                                                                                                                                                                                                                                                                                                                             | Evidence-Based<br>Evidence Based Intervention<br>Evidence-Based Health Care<br>Care Bundles<br>Evidence-Based Professional Practice<br>Evidence Based Practice Center            | Primary Care        |
| CINAHL: Indexed terms (Headings) | Food*<br>Diet<br><br>Diet Therapy<br>Dietetics<br>Dietitian Attitudes<br>Eating<br>Eating Behaviour<br>Eating Disorders<br>Food<br>Food Guide Pyramid<br>Nutrition<br>Nutrition Alteration (Saba CCC)<br>Nutrition Care (Saba CCC)<br>Nutrition Disorders<br>Nutrition Education<br>Nutritional and Metabolic Diseases<br>Nutritional Assessment<br>Nutritional Component (Saba CCC)<br>Nutritional Counseling<br>Nutritional Physiology<br>Nutritional Requirements<br>Nutritional Status | Evidence-Based Professional Practice<br>Evidence Based Practice Center<br>Evidence-Based Professional Practice                                                                   | Primary Health Care |
| CINAHL: Keywords                 | Applied Nutrition Programs<br>Nutri*<br>Diet*<br>Eat*<br>Feed*<br>Food*                                                                                                                                                                                                                                                                                                                                                                                                                    | Evidence-Based Practice<br>Patient Care Bundles<br>Evidence Based Practice Center<br>Evidence-Based<br>Evidence Based Intervention<br>Evidence-Based Health Care<br>Care Bundles | Primary Care        |

(Continued)

Table 1. (Continued)

| Database                       | Nutritional management                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Evidence-based practice                                                                                                                                                                                           | Primary health care                                                     |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| EMBASE: Indexed terms (Emtree) | Diet<br>Diet Therapy<br>Dietary Compliance<br>Dietary Intake<br>Dietetics<br>Eating<br>Eating Disorder<br>Feeding<br>Feeding Behaviour<br>Feeding Difficulty<br>Feeding Disorder<br>Food<br>Food Guide Pyramid<br>Food Intake<br>Nutrition<br>Nutrition Education<br>Nutritional Assessment<br>Nutritional Counseling<br>Nutritional Deficiency<br>Nutritional Disorder<br>Nutritional Health<br>Nutritional Requirement<br>Nutritional Science<br>Nutritional Status                                                                                                                                                                                                                                                                                                                                                                                                            | Evidence Based Practice<br>Evidence Based Practice Center<br>Care Bundles                                                                                                                                         | Primary Health Care                                                     |
| EMBASE: Keywords               | Applied Nutrition Programs<br>Nutri*<br><br>Diet*<br>Eat*<br>Feed*<br>Food*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Patient Care Bundles<br>Evidence-Based Professional Practice<br>Evidence-Based<br>Evidence Based Intervention<br>Evidence-Based Health Care                                                                       | Primary Care                                                            |
| LILACS: Indexed terms (DeCS)   | Applied Nutrition Programs/<br><br>Programas de Nutrición Aplicada/<br><br>Programas de Nutrição Aplicada<br>Diet/Dieta/Dieta<br>Diet Therapy/Dietoterapia/Dietoterapia<br>Diet, Food, and Nutrition/<br>Nutrición, Alimentación y Dieta/<br>Alimentos, Dieta e Nutrição<br>Dietary Services/Servicios Dietéticos/<br>Serviços de Dietética<br>Dietetics/Dietética/Dietética<br>Eating/Ingestión de Alimentos/<br>Ingestão de Alimentos<br>Feeding/Alimentación/Alimentação<br>Feeding and Eating Disorders/<br>Trastornos de Alimentación y de la Ingestión de Alimentos/Transtornos da Alimentação e da Ingestão de Alimentos<br>Feeding Behaviour/Conducta Alimentaria/<br>Comportamento Alimentar<br>Food/Alimentos/Alimentos<br>Food and Nutrition Education/<br>Educación Alimentaria y Nutricional/<br>Educação Alimentar e Nutricional<br>Food Guide/Guias Alimentarias/ | Evidence-Based Practice/<br><br>Práctica Clínica Basada en la Evidencia/Prática Clínica Baseada em Evidências<br>Patient Care Bundles/<br>Paquetes de Atención al Paciente/<br>Pacotes de Assistência ao Paciente | Primary Health Care/Atención Primaria de Salud/Atenção Primária à Saúde |

(Continued)

Table 1. (Continued)

| Database                                                  | Nutritional management                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Evidence-based practice              | Primary health care |
|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------|
|                                                           | Guías Alimentares<br>Food Planning/Planificación Alimentaria/<br>Planejamento Alimentar<br>Nutrition Assessment/Evaluación Nutricional/<br>Avaliação Nutricional<br>Nutrition Processes/Procesos de la Nutrición/<br>Processos Nutricionais<br>Nutrition Programs/Programas de Nutrición/<br>Programas de Nutrição<br>Nutrition Rehabilitation/Recuperación Nutricional/<br>Recuperação Nutricional<br>Nutrition Therapy/Terapia Nutricional/<br>Terapia Nutricional<br>Nutritional and Metabolic Diseases/Enfermedades<br>Nutricionales y Metabólicas/<br>Doenças Nutricionais e Metabólicas<br>Nutrition Disorders/Trastornos Nutricionales/<br>Transtornos Nutricionais<br>Nutritional Physiological Phenomena/<br>Fenómenos Fisiológicos de la Nutrición/<br>Fenômenos Fisiológicos da Nutrição<br>Nutritional Requirements/Necesidades<br>Nutricionales/Necessidades Nutricionais<br>Nutritional Sciences/Ciencias Nutricionales/<br>Ciências da Nutrição<br>Nutritional Status/Estado Nutricional/<br>Estado Nutricional |                                      |                     |
| LILACS: Keywords                                          | Diet\$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Evidence-Based Professional Practice | Primary Care        |
|                                                           | Eat\$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Evidence Based Practice Center       |                     |
|                                                           | Feed\$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Evidence-Based                       |                     |
|                                                           | Food\$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Evidence Based Intervention          |                     |
|                                                           | Nutri\$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Evidence-Based Health Care           |                     |
|                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Care Bundles                         |                     |
| PsycINFO: Indexed terms<br>(Psychological Index<br>Terms) | Diets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Evidence Based Practice              | Primary Health Care |
|                                                           | Eating Attitudes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                      |                     |
|                                                           | Eating Behaviour                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                      |                     |
|                                                           | Eating Disorders                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                      |                     |
|                                                           | Feeding Disorders                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                      |                     |
|                                                           | Food                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                      |                     |
|                                                           | Food Intake                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                      |                     |
|                                                           | Nutrition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                     |
|                                                           | Nutritional Deficiencies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                      |                     |
| PsycINFO: Keywords                                        | Applied Nutrition Programs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Evidence-Based Professional Practice | Primary Care        |
|                                                           | Nutri*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Evidence Based Practice Center       |                     |
|                                                           | Diet*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Evidence-Based                       |                     |
|                                                           | Eat*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Evidence Based Intervention          |                     |
|                                                           | Feed*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Evidence-Based Health Care           |                     |
|                                                           | Food*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Care Bundles                         |                     |
| ERIC: Indexed terms                                       | Dietetics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Has no indexed terms                 | Primary Health Care |
|                                                           | Eating Disorders                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                      |                     |
|                                                           | Eating Habits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                      |                     |
|                                                           | Food                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                      |                     |
|                                                           | Food Service                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                      |                     |
|                                                           | Food Standards                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                      |                     |
|                                                           | Foods Instruction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                      |                     |
|                                                           | Nutrition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                     |
|                                                           | Nutrition Instruction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                      |                     |

(Continued)

**Table 1. (Continued)**

| Database              | Nutritional management                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Evidence-based practice                                                                                                                                                                                                  | Primary health care                 |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| ERIC: Keywords        | Applied Nutrition Programs<br>Nutri*<br>Diet*<br><br>Eat*<br>Feed*<br>Food*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Evidence-Based Practice<br>Patient Care Bundles<br>Evidence-Based Professional Practice<br>Evidence Based Practice Center<br>Evidence-Based<br>Evidence Based Intervention<br>Evidence-Based Health Care<br>Care Bundles | Primary Care                        |
| SCOPUS: Indexed terms | Has no indexed terms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Has no indexed terms                                                                                                                                                                                                     | Has no indexed terms                |
| SCOPUS: Keywords      | Applied Nutrition Programs<br>Diet<br>Diet Therapy<br><br>diet therapy [subheading]<br>Diet, Food, and Nutrition<br>Dietary Compliance<br>Dietary Intake<br>Dietary Services<br>Dietetics<br>Dietitian Attitudes<br>Eating<br>Eating Attitudes<br>Eating Behaviour<br>Eating Disorder<br>Feeding<br>Feeding Behaviour<br>Feeding Difficulty<br>Feeding Disorder<br>Food<br>Food Guide<br>Food Guide Pyramid<br>Food Intake<br>Food Planning<br>Nutrition<br>Nutrition Alteration<br>Nutrition Assessment<br>Nutrition Care<br>Nutrition Disorders<br>Nutrition Education<br>Nutrition Processes<br>Nutrition Programs<br>Nutrition Rehabilitation<br>Nutrition Therapy<br>Nutritional and Metabolic Diseases<br>Nutritional Assessment<br>Nutritional Component<br>Nutritional Counseling<br>Nutritional Deficiency<br>Nutritional Disorder<br>Nutritional Health<br>Nutritional Physiology<br>Nutritional Requirement<br>Nutritional Science<br>Nutritional Status<br>Dietary management<br>Nutritional management<br>Feeding patterns<br>Nutri*<br>Diet*<br>Eat*<br>Feed*<br>Food* | Evidence-Based Practice<br>Patient Care Bundles<br>Evidence-Based Professional Practice<br>Evidence Based Practice Center<br>Evidence-Based<br>Evidence Based Intervention<br>Evidence-Based Health Care<br>Care Bundles | Primary Health Care<br>Primary Care |

*(Continued)*

Table 1. (Continued)

| Database                                 | Nutritional management             | Evidence-based practice                 | Primary health care |
|------------------------------------------|------------------------------------|-----------------------------------------|---------------------|
| Open Access Theses and<br>Dissertations: | Applied Nutrition Programs         | Evidence-Based Practice                 | Primary Health Care |
| Keywords                                 | Diet                               | Patient Care Bundles                    | Primary Care        |
|                                          | Diet Therapy                       | Evidence-Based Professional<br>Practice |                     |
|                                          | Diet, Food, and Nutrition          | Evidence Based Practice Center          |                     |
|                                          | Dietary Compliance                 | Evidence-Based                          |                     |
|                                          | Dietary Intake                     | Evidence Based Intervention             |                     |
|                                          | Dietary Services                   | Evidence-Based Health Care              |                     |
|                                          | Dietetics                          | Care Bundles                            |                     |
|                                          | Dietitian Attitudes                |                                         |                     |
|                                          | Eating                             |                                         |                     |
|                                          | Eating Attitudes                   |                                         |                     |
|                                          | Eating Behaviour                   |                                         |                     |
|                                          | Eating Disorder                    |                                         |                     |
|                                          | Feeding                            |                                         |                     |
|                                          | Feeding Behaviour                  |                                         |                     |
|                                          | Feeding Difficulty                 |                                         |                     |
|                                          | Feeding Disorder                   |                                         |                     |
|                                          | Food                               |                                         |                     |
|                                          | Food Guide                         |                                         |                     |
|                                          | Food Guide Pyramid                 |                                         |                     |
|                                          | Food Intake                        |                                         |                     |
|                                          | Food Planning                      |                                         |                     |
|                                          | Nutrition                          |                                         |                     |
|                                          | Nutrition Alteration               |                                         |                     |
|                                          | Nutrition Assessment               |                                         |                     |
|                                          | Nutrition Care                     |                                         |                     |
|                                          | Nutrition Disorders                |                                         |                     |
|                                          | Nutrition Education                |                                         |                     |
|                                          | Nutrition Processes                |                                         |                     |
|                                          | Nutrition Programs                 |                                         |                     |
|                                          | Nutrition Rehabilitation           |                                         |                     |
|                                          | Nutrition Therapy                  |                                         |                     |
|                                          | Nutritional and Metabolic Diseases |                                         |                     |
|                                          | Nutritional Assessment             |                                         |                     |
|                                          | Nutritional Component              |                                         |                     |
|                                          | Nutritional Counseling             |                                         |                     |
|                                          | Nutritional Deficiency             |                                         |                     |
|                                          | Nutritional Disorder               |                                         |                     |
|                                          | Nutritional Health                 |                                         |                     |
|                                          | Nutritional Physiology             |                                         |                     |
|                                          | Nutritional Requirement            |                                         |                     |
|                                          | Nutritional Science                |                                         |                     |
|                                          | Nutritional Status                 |                                         |                     |
|                                          | Dietary management                 |                                         |                     |
|                                          | Nutritional management             |                                         |                     |
|                                          | Feeding patterns                   |                                         |                     |
|                                          | Nutri*                             |                                         |                     |
|                                          | Diet*                              |                                         |                     |
|                                          | Eat*                               |                                         |                     |
|                                          | Feed*                              |                                         |                     |
|                                          | Food*                              |                                         |                     |

(Continued)

**Table 1.** (Continued)

| Database                                  | Nutritional management                                | Evidence-based practice               | Primary health care      |
|-------------------------------------------|-------------------------------------------------------|---------------------------------------|--------------------------|
| Catálogo de Teses e Dissertações (CAPES): | Programas de Nutrição Aplicada                        | Prática Clínica Baseada em Evidências | Atenção Primária à Saúde |
| Keywords                                  | Dieta                                                 | Prática Baseada em Evidências         | Atenção Básica à Saúde   |
|                                           | Dietoterapia                                          | Pacotes de Assistência ao Paciente    | Atenção Primária         |
|                                           | Alimentos, Dieta e Nutrição                           | Baseada em Evidências                 | Atenção Básica           |
|                                           | Serviços de Dietética                                 | Evidências                            |                          |
|                                           | Dietética                                             |                                       |                          |
|                                           | Ingestão de Alimentos                                 |                                       |                          |
|                                           | Alimentação                                           |                                       |                          |
|                                           | Transtornos da Alimentação e da Ingestão de Alimentos |                                       |                          |
|                                           | Comportamento Alimentar                               |                                       |                          |
|                                           | Alimentos                                             |                                       |                          |
|                                           | Educação Alimentar e Nutricional                      |                                       |                          |
|                                           | Guias Alimentares                                     |                                       |                          |
|                                           | Planejamento Alimentar                                |                                       |                          |
|                                           | Avaliação Nutricional                                 |                                       |                          |
|                                           | Processos Nutricionais                                |                                       |                          |
|                                           | Programas de Nutrição                                 |                                       |                          |
|                                           | Recuperação Nutricional                               |                                       |                          |
|                                           | Terapia Nutricional                                   |                                       |                          |
|                                           | Doenças Nutricionais e Metabólicas                    |                                       |                          |
|                                           | Transtornos Nutricionais                              |                                       |                          |
|                                           | Fenômenos Fisiológicos da Nutrição                    |                                       |                          |
|                                           | Necessidades Nutricionais                             |                                       |                          |
|                                           | Ciências da Nutrição                                  |                                       |                          |
|                                           | Estado Nutricional                                    |                                       |                          |
|                                           | Nutri\$                                               |                                       |                          |
|                                           | Aliment\$                                             |                                       |                          |
|                                           | Diet\$                                                |                                       |                          |

scoping review found one study directed towards nutritional risk/malnutrition (Kennelly *et al.* 2010).

The general characteristics of the studies included in this scoping review, their themes, an outline of the implementation process for the interventions and the health professionals involved are detailed in Table 3.

### *Implementation processes*

The implementation processes described in the studies show that evidence-based nutritional management in PHC settings was based on four steps: (1) acknowledging health needs in the catchment area and determining the characteristics of services and health professionals; (2) developing continuing education aimed at practitioners; (3) integrating nutritional management into interprofessional practice; and (4) adapting the interventions using a patient-centred care approach.

#### *Acknowledging health needs in the catchment area and the characteristics of services and health professionals*

Eight of the studies in this review analysed the execution of activities and the dynamics of the work process before beginning implementation (The Counterweight Project Team 2004; Inglis *et al.* 2010; Kennelly *et al.* 2010; Shaikh *et al.* 2014; Baerug *et al.* 2016; Little *et al.* 2016; Gabrielli *et al.* 2017; Garza *et al.* 2017).

#### *Developing continuing education for practitioners*

Nine of the studies selected for this review referred to the adoption of pre-intervention training and support materials as strategies to assist in the implementation of evidence-based nutritional management in PHC services (The Counterweight Project Team 2004; Labarere *et al.* 2005; Beich *et al.* 2007; Ewing *et al.* 2009; Corriveau *et al.* 2013; Hernández-Aguilar *et al.* 2014; Cloutier *et al.* 2015; Mueller 2015; Baerug *et al.* 2016). Another five studies described moments of the providers' work routine in which they shared their experiences regarding the implementation process in order to improve it (Sargent 2011; Bettinelli *et al.* 2012; Shaikh *et al.* 2014; Schwartz *et al.* 2015; Garza *et al.* 2017).

#### *Integrating nutritional management into interprofessional practice*

Integrating nutritional management into interprofessional practice was addressed through different aspects, including: task division within the implementing organisation (The Counterweight Project Team 2004; Glasgow *et al.* 2004; Labarere *et al.* 2005; Beich *et al.* 2007; Vachon *et al.* 2007; Ewing *et al.* 2009; Corriveau *et al.* 2013; Ornstein *et al.* 2013; Shaikh *et al.* 2014; Mueller 2015); training with different groups professional in interaction (Kennelly *et al.* 2010; Clifford and Shakeshaft

**Table 2. Combination of indexed terms and/or keywords for the search through using Boolean operators (AND/OR)**

| Source                                   | Combinations through the Boolean operators (AND/OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | No. hits each time |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| PubMed                                   | (‘Diet’[Mesh] OR ‘Diet Therapy’[Mesh] OR ‘diet therapy’[subheading] OR ‘Diet, Food, and Nutrition’[Mesh] OR ‘Dietary Services’[Mesh] OR ‘Dietetics’[Mesh] OR ‘Eating’[Mesh] OR ‘Feeding and Eating Disorders’[Mesh] OR ‘Feeding Behavior’[Mesh] OR ‘Food’[Mesh] OR ‘Nutrition Assessment’[Mesh] OR ‘Nutrition Disorders’[Mesh] OR ‘Nutrition Therapy’[Mesh] OR ‘Nutritional and Metabolic Diseases’[Mesh] OR ‘Nutritional Physiological Phenomena’[Mesh] OR ‘Nutritional Requirements’[Mesh] OR ‘Nutritional Sciences’[Mesh] OR ‘Nutritional Status’[Mesh])                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2 308 634          |
|                                          | (‘Applied Nutrition Programs’[Title/Abstract] OR Nutri*[Title/Abstract] OR Diet*[Title/Abstract] OR Eat*[Title/Abstract] OR Feed*[Title/Abstract] OR Food*[Title/Abstract])                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1 599 300          |
|                                          | ((‘Diet’[Mesh] OR ‘Diet Therapy’[Mesh] OR ‘diet therapy’[subheading] OR ‘Diet, Food, and Nutrition’[Mesh] OR ‘Dietary Services’[Mesh] OR ‘Dietetics’[Mesh] OR ‘Eating’[Mesh] OR ‘Feeding and Eating Disorders’[Mesh] OR ‘Feeding Behavior’[Mesh] OR ‘Food’[Mesh] OR ‘Nutrition Assessment’[Mesh] OR ‘Nutrition Disorders’[Mesh] OR ‘Nutrition Therapy’[Mesh] OR ‘Nutritional and Metabolic Diseases’[Mesh] OR ‘Nutritional Physiological Phenomena’[Mesh] OR ‘Nutritional Requirements’[Mesh] OR ‘Nutritional Sciences’[Mesh] OR ‘Nutritional Status’[Mesh]) OR (‘Applied Nutrition Programs’[Title/Abstract] OR Nutri*[Title/Abstract] OR Diet*[Title/Abstract] OR Eat*[Title/Abstract] OR Feed*[Title/Abstract] OR Food*[Title/Abstract]))                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3 207 815          |
|                                          | (‘Evidence-Based Practice’[Mesh] OR ‘Patient Care Bundles’[Mesh])                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 90 868             |
|                                          | (‘Evidence-Based’[Title/Abstract] OR ‘Evidence Based Intervention’[Title/Abstract] OR ‘Evidence-Based Health Care’[Title/Abstract] OR ‘Care Bundles’[Title/Abstract] OR ‘Evidence-Based Professional Practice’[Title/Abstract] OR ‘Evidence Based Practice Center’[Title/Abstract])                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 125 177            |
|                                          | ((‘Evidence-Based Practice’[Mesh] OR ‘Patient Care Bundles’[Mesh]) OR (‘Evidence-Based’[Title/Abstract] OR ‘Evidence Based Intervention’[Title/Abstract] OR ‘Evidence-Based Health Care’[Title/Abstract] OR ‘Care Bundles’[Title/Abstract] OR ‘Evidence-Based Professional Practice’[Title/Abstract] OR ‘Evidence Based Practice Center’[Title/Abstract]))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 180 177            |
|                                          | (‘Primary Health Care’[Mesh])                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 165 872            |
|                                          | (‘Primary Care’[Title/Abstract])                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 122 459            |
|                                          | ((‘Primary Health Care’[Mesh]) OR (‘Primary Care’[Title/Abstract]))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 238 253            |
|                                          | ((((‘Diet’[Mesh] OR ‘Diet Therapy’[Mesh] OR ‘diet therapy’[subheading] OR ‘Diet, Food, and Nutrition’[Mesh] OR ‘Dietary Services’[Mesh] OR ‘Dietetics’[Mesh] OR ‘Eating’[Mesh] OR ‘Feeding and Eating Disorders’[Mesh] OR ‘Feeding Behavior’[Mesh] OR ‘Food’[Mesh] OR ‘Nutrition Assessment’[Mesh] OR ‘Nutrition Disorders’[Mesh] OR ‘Nutrition Therapy’[Mesh] OR ‘Nutritional and Metabolic Diseases’[Mesh] OR ‘Nutritional Physiological Phenomena’[Mesh] OR ‘Nutritional Requirements’[Mesh] OR ‘Nutritional Sciences’[Mesh] OR ‘Nutritional Status’[Mesh]) OR (‘Applied Nutrition Programs’[Title/Abstract] OR Nutri*[Title/Abstract] OR Diet*[Title/Abstract] OR Eat*[Title/Abstract] OR Feed*[Title/Abstract] OR Food*[Title/Abstract])) AND ((‘Evidence-Based Practice’[Mesh] OR ‘Patient Care Bundles’[Mesh]) OR (‘Evidence-Based’[Title/Abstract] OR ‘Evidence Based Intervention’[Title/Abstract] OR ‘Evidence-Based Health Care’[Title/Abstract] OR ‘Care Bundles’[Title/Abstract] OR ‘Evidence-Based Professional Practice’[Title/Abstract] OR ‘Evidence Based Practice Center’[Title/Abstract])) AND ((‘Primary Health Care’[Mesh]) OR (‘Primary Care’[Title/Abstract])))) | 1224               |
| Catálogo de Teses e Dissertações (CAPES) | ((‘Programas de Nutrição Aplicada’ OR ‘Dieta’ OR ‘Dietoterapia’ OR ‘Alimentos, Dieta e Nutrição’ OR ‘Serviços de Dietética’ OR ‘Dietética’ OR ‘Ingestão de Alimentos’ OR ‘Alimentação’ OR ‘Transtornos da Alimentação e da Ingestão de Alimentos’ OR ‘Comportamento Alimentar’ OR ‘Alimentos’ OR ‘Educação Alimentar e Nutricional’ OR ‘Guias Alimentares’ OR ‘Planejamento Alimentar’ OR ‘Avaliação Nutricional’ OR ‘Processos Nutricionais’ OR ‘Programas de Nutrição’ OR ‘Recuperação Nutricional’ OR ‘Terapia Nutricional’ OR ‘Doenças Nutricionais e Metabólicas’ OR ‘Transtornos Nutricionais’ OR ‘Fenômenos Fisiológicos da Nutrição’ OR ‘Necessidades Nutricionais’ OR ‘Ciências da Nutrição’ OR ‘Estado Nutricional’ OR Nutri\$ OR Aliment\$ OR Diet\$) AND (‘Prática Clínica Baseada em Evidências’ OR ‘Prática Baseada em Evidências’ OR ‘Pacotes de Assistência ao Paciente’ OR ‘Baseada em Evidências’ OR ‘Evidências’) AND (‘Atenção Primária à Saúde’ OR ‘Atenção Básica à Saúde’ OR ‘Atenção Primária’ OR ‘Atenção Básica’))                                                                                                                                            | 235                |

2011; Bettinelli *et al.* 2012; Ornstein *et al.* 2013; Hernández-Aguilar *et al.* 2014; Shaikh *et al.* 2014; Schwartz *et al.* 2015; Baerug *et al.* 2016); meetings to share and discuss experiences (The Counterweight Project Team 2004; Clifford and Shakeshaft 2011; Sargent 2011; Bettinelli *et al.* 2012; Ornstein *et al.* 2013; Shaikh *et al.* 2014; Fontoura *et al.* 2015; Schwartz *et al.*

2015; Aguiar *et al.* 2017; Garza *et al.* 2017); and supervision and support from researchers and/or specialist professionals (The Counterweight Project Team 2004; Ewing *et al.* 2009; Inglis *et al.* 2010; Kennelly *et al.* 2010; Clifford and Shakeshaft 2011; Bettinelli *et al.* 2012; Corriveau *et al.* 2013; Ornstein *et al.* 2013; Shaikh *et al.* 2014; Fontoura *et al.* 2015; Schwartz *et al.* 2015;

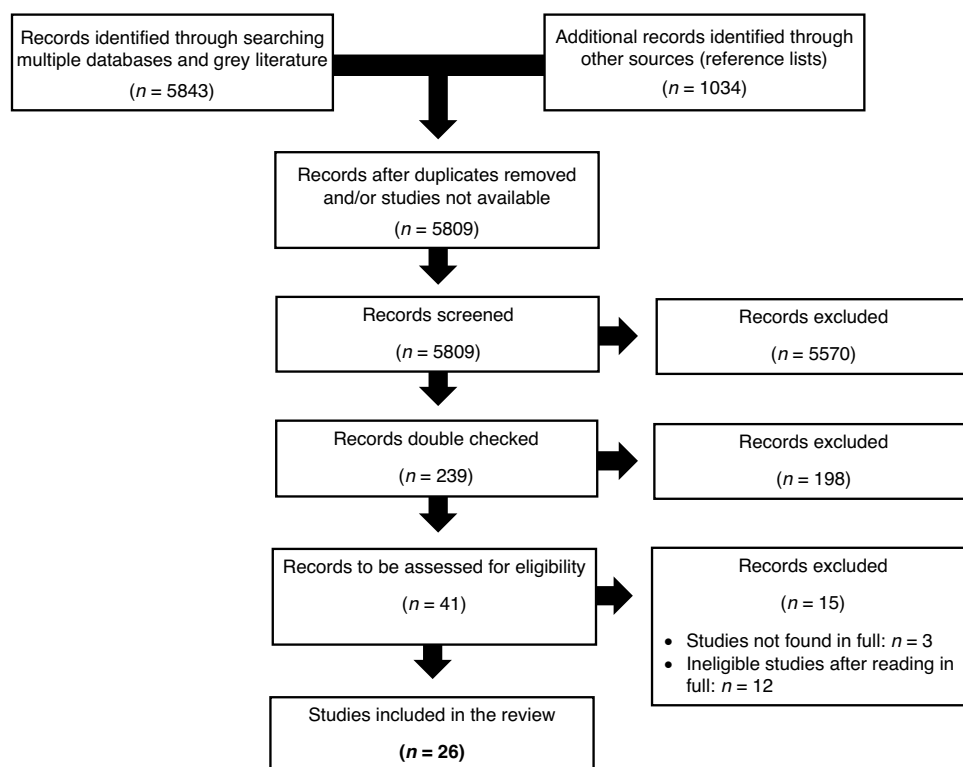


Fig. 1. Adapted Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart.

Baerug *et al.* 2016; Gabrielli *et al.* 2017; Aguiar *et al.* 2017; Garza *et al.* 2017; Souza *et al.* 2017a).

#### *Adapting interventions using a patient-centred care approach*

The reviewed studies demonstrated that shared decision making was the main element of patient-centred care, primarily through the setting of goals and/or structuring strategies to overcome possible difficulties in the change process. Meetings and face-to-face consultations with health professionals were considered the most appropriate conditions for health care. However, nine studies provided evidence that the use of digital media in the implementation of interventions (virtual platforms, text messages and emails, sometimes accompanied by telephone contact) guaranteed the sustainability of changes in the follow-up stages (Glasgow *et al.* 2004; Sargent 2011; Ornstein *et al.* 2013; Cloutier *et al.* 2015; Schwartz *et al.* 2015; Huseinovic *et al.* 2016; Little *et al.* 2016; Gabrielli *et al.* 2017; Garza *et al.* 2017).

#### *Barriers to and facilitators of implementation*

The most frequent barriers to the implementation of evidence-based nutritional management in primary care included time constraints, a lack of resources, incompatibility of the proposed interventions with patients' living conditions and health needs and resistance to change in working dynamics.

Among the potential factors facilitating implementation, the main factors identified were pre-intervention training, the provision of support materials for health professionals,

interprofessional actions with support from specialists, easy to apply interventions adapted to patients' needs and the situation of the services.

The barriers to and facilitators of implementation processes mentioned by at least three studies included in this review found to be linked to the four steps described above are presented in Table 4.

## Discussion

A review by Brownson *et al.* (2018) discussed different approaches to the process of translating scientific evidence into practice in public health services, stressing that there is a disconnect between the 'evidence generators' and the 'evidence users', thus reinforcing the premise that the implementation process is as crucial as the scientific evidence in the effectiveness of nutritional management.

This scoping review showed that the initial step in the implementation process of evidence-based nutritional management in PHC settings is based on the understanding of the needs of users and families and the availability of resources in the community (e.g. access points to healthy foods), acknowledging current practices and incorporating the current characteristics of health professionals (knowledge, skills, attitudes, trust and interest) regarding nutritional counselling.

According to Cabana and Flores (2002) and Souza *et al.* (2017b), an analysis of the demographic and epidemiological aspects of the region, such as life expectancy and disease burden, as well as the current practices and situation of each health unit, organisational issues (staff, pressure for productivity) and/or

**Table 3. General characteristics of the studies included, outlines of the implementation process and the health professionals involved**  
EAAB, Estratégia Aumentada e Alimentação Brasileira; EMRs, electronic medical records; RCT, randomised control trial

| Theme         | Study                           | Country of origin | Objective                                                                                                                                                                                                                                          | Study design                                                    | Outline of implementation                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Health professionals                                                                                                                 |
|---------------|---------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Breastfeeding | Baerug <i>et al.</i> (2016)     | Norway            | To assess the effectiveness of the 'Friends of the Baby' initiative in community health services                                                                                                                                                   | Quasi-RCT                                                       | Knowledge of the territory and current practices<br>Creation and accreditation of an internal breastfeeding support policy<br>Pre-intervention training<br>Breastfeeding counselling supported by the internal policy created<br>Pre-intervention training<br>Face-to-face consultation (babies 15 days old)<br>Monthly monitoring (routine face-to-face consultations)                                                                                                        | Community health service staff (unspecified) supervised by nurses linked to the 'Baby Friendly Health Center' initiative             |
| Breastfeeding | Labarere <i>et al.</i> (2005)   | France            | To determine whether the first postpartum medical care is capable of promoting improvement in breastfeeding                                                                                                                                        | Prospective, randomised, parallel and open-group clinical trial | Breastfeeding support program<br>Breastfeeding support (cases with difficulties breastfeeding)<br>Training at EAAB<br>Counselling in shared consultations and/or home visits during prenatal and puerperium periods<br>Meeting of pregnant and postpartum women for breastfeeding workshop<br>Elaboration of an EAAB implementation plan in the city<br>Training workshops for tutors and work-shops in health units<br>Organisation of the certification process for the EAAB | Paediatricians and family physicians                                                                                                 |
| Breastfeeding | Mueller (2015)                  | US                | To implement a breastfeeding support program in the primary care service, aiming to improve breastfeeding rates                                                                                                                                    | Retrospective study                                             | Pre-intervention training<br>Screening followed by referral to a breastfeeding support program<br>Breastfeeding support (cases with difficulties breastfeeding)                                                                                                                                                                                                                                                                                                                | Unspecified health professionals                                                                                                     |
| Breastfeeding | Souza <i>et al.</i> (2017a)     | Brazil            | After training at the EAAB, to promote exclusive breastfeeding, with early identification of difficulties that may be interfering with this practice                                                                                               | Experience report                                               | Training at EAAB<br>Counselling in shared consultations and/or home visits during prenatal and puerperium periods<br>Meeting of pregnant and postpartum women for breastfeeding workshop<br>Elaboration of an EAAB implementation plan in the city<br>Training workshops for tutors and work-shops in health units<br>Organisation of the certification process for the EAAB                                                                                                   | GPs, nursing staff, community health workers and speech therapists                                                                   |
| Breastfeeding | Aguilar <i>et al.</i> (2017)    | Brazil            | To create a plan to implement the EAAB in Family Health Units in the city of Paulista, Brazil                                                                                                                                                      | Experience report                                               | Training workshops for tutors and work-shops in health units<br>Implementation of EAAB in the routine of services                                                                                                                                                                                                                                                                                                                                                              | Unspecified health professionals and managers                                                                                        |
| Breastfeeding | Fontoura <i>et al.</i> (2015)   | Brazil            | To implement and certify four health units in the municipality of Gravataí in the EAAB                                                                                                                                                             | Experience report                                               | Training workshops for tutors and work-shops in health units<br>Implementation of EAAB in the routine of services                                                                                                                                                                                                                                                                                                                                                              | Unspecified health professionals and managers                                                                                        |
| Breastfeeding | Bettinelli <i>et al.</i> (2012) | Italy             | To describe the development and implementation strategies of the 'Baby Friendly Community' initiative, which aims to protect, promote and support breastfeeding at the community level, as an expansion of the 'Baby Friendly Hospital' initiative | Pilot study                                                     | Request for certification of the EAAB<br>Collection of data on the implementation of the 'Baby Friendly Community' initiative in other countries, adapting them to the local reality<br>Presentation and implementation of 'best practices to be followed' for accreditation as a 'baby-friendly community'                                                                                                                                                                    | Health professionals engaged in breastfeeding promotion initiatives (allocated to community health services and independent experts) |

(continued next page)

Table 3. (Continued)

| Theme          | Study                                  | Country of origin | Objective                                                                                                                                                                                                                                                                                       | Study design                       | Outline of implementation                                                                                                                                                                                                                                                                                                                                                              | Health professionals                                                                                                                             |
|----------------|----------------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Breastfeeding  | Corriveau <i>et al.</i> (2013)         | US                | To determine whether the implementation of a program based on a clinical protocol affects breastfeeding rates within a paediatric primary care setting                                                                                                                                          | Retrospective study, before–after  | Pre-intervention training<br>Screening for possible breastfeeding problems followed by referral to a specialist<br>Presentation by local health services to the community of activities aimed at encouraging breastfeeding<br>Structuring an internal policy based on prior bibliographic review<br>Pre-intervention training<br>Face-to-face and telephone consultations, home visits | Unspecified health professionals and lactation/breastfeeding specialists (nursing staff)                                                         |
| Breastfeeding  | Schwartz <i>et al.</i> (2015)          | US                | To collect information on the implementation of 10 evidence-based steps to support breastfeeding                                                                                                                                                                                                | Pilot study                        | Accreditation process for the Baby Friendly initiative in primary care services<br>Creation of a website with information on breastfeeding, beyond strengthening support groups 'mother to mother', scientific meetings and training for professionals                                                                                                                                 | Paediatricians, family physicians and other unspecified health professionals (with support from researchers)                                     |
| Breastfeeding  | Hernández-Aguilar <i>et al.</i> (2014) | Spain             | To reassess the implementation of the 'Baby Friendly' initiative, aiming to develop a new strategic plan, if necessary                                                                                                                                                                          | Experience report                  | Delivery of an educational leaflet to parents, followed by verbal reinforcement of the messages presented<br>Feedback from healthcare professionals and parents                                                                                                                                                                                                                        | Unspecified health professionals (quotes paediatricians, obstetricians, midwives, nurses, medical residents)                                     |
| Infant feeding | Inglis <i>et al.</i> (2010)            | England           | To describe the evaluation of an intervention to promote healthy eating behaviours in children up to 5 years old                                                                                                                                                                                | Qualitative and quantitative study | Pre-intervention training<br>Recognition of current practices<br>Delivery of an educational leaflet to parents, followed by verbal reinforcement of the messages presented<br>Feedback from healthcare professionals and parents                                                                                                                                                       | GPs and practice nurses (with support from a nutritionist who is a member of the research team)                                                  |
| Infant feeding | Cloutier <i>et al.</i> (2015)          | US                | To implement a program aimed at reducing obesogenic behaviours in children aged 2–4 years with low-income mothers and children attending a primary care clinic                                                                                                                                  | Controlled clinical trial          | Pre-intervention training<br>Face-to-face consultation<br>Longitudinal remote monitoring                                                                                                                                                                                                                                                                                               | Clinicians (GPs) and nurses                                                                                                                      |
| Infant feeding | Ewing <i>et al.</i> (2009)             | US                | To assess the feasibility of behavioural interventions, based on evidence, aimed at the regulation and maintenance of weight with children and their parents during meetings in primary care services, aiming to make them sustainable in the work routine                                      | Translational research             | Pre-intervention training<br>Screening followed by referral to face-to-face group meetings (parents and children in separate groups)<br>Conversations with parent–child dyad as part of group meetings<br>Individual face-to-face meetings (parent–child dyad) after group meetings                                                                                                    | GPs and nurses (with support from a psychologist who is a member of the research team)                                                           |
| Infant feeding | Shaikh <i>et al.</i> (2014)            | US                | To assess the impact of the participation of health professionals in a virtual learning network that aims to improve the quality of services provided, especially with regard to adherence to clinical recommendations aimed at preventing childhood obesity in primary services in rural areas | Prospective pre-post study         | Knowledge of the territory and current practices<br>Pre-intervention training<br>Screening followed by face-to-face consultation<br>Exchange of experiences between professionals and feedback from parents                                                                                                                                                                            | Family physicians, paediatricians, medical assistant, nurses (with support from managers, professionals from other health units and researchers) |

|                              |                                        |           |                                                                                                                                                                                                           |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                              |
|------------------------------|----------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Infant feeding               | Gabrielli <i>et al.</i> (2017)         | Italy     | To develop and implement a nutrition education app aimed at parents of overweight children (aged 7–12 years)                                                                                              | Pilot study                                          | Recognition of existing practices, also with regard to nutrition education applications<br>Recognition of families' difficulties in adopting healthy eating habits<br>Creation and implementation of the app prototype with the target families<br>Feedback from parents<br>Creation of a protocol for the treatment of childhood obesity based on a bibliographic survey<br>Pre-intervention training<br>Ineligible families: delivery of educational material<br>Eligible families: individual counselling sessions<br>Educational group session (with parents) after a period of individual sessions<br>Longitudinal remote monitoring<br>Feedback from healthcare professionals and parents | Paediatricians and nutritionists                             |
| Infant feeding               | Sargent (2011)                         | Australia | After a previous bibliographic survey, to create a protocol for the treatment of childhood obesity and evaluate the feasibility of its implementation in the practice of Australian primary care services | Pilot study                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | GPs and nurses (with support from managers and researchers)  |
| Overweight/obesity in adults | The Counter-weight Project Team (2004) | UK        | To provide a structured and multistrategic approach to the management of obesity in primary care services, aiming to facilitate its implementation into the work routine                                  | RCT                                                  | Knowledge of the territory and current practices<br>Pre-intervention training<br>Screening followed by referral to individual face-to-face or group meetings<br>Longitudinal monitoring                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | GPs and nurses (with support from specialist nutritionists)  |
| Overweight/obesity in adults | Little <i>et al.</i> (2016)            | England   | To estimate the effectiveness and cost-effectiveness of a weight management intervention with a behavioural focus based on an electronic system, with obese patients treated in primary care services     | Pragmatic, parallel, controlled and randomised study | Screening from EMRs followed by direction to self-learning sessions on a virtual platform<br>Support in person or by telephone or email                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Nurses                                                       |
| Overweight/obesity in adults | Huseinovic <i>et al.</i> (2016)        | Sweden    | To examine the short- and long-term effectiveness of a dietary treatment for weight loss among puerperal women in the primary care service                                                                | Randomised controlled clinical trial                 | Request to fill in food diary<br>Face-to-face consultation<br>Longitudinal monitoring by SMS, telephone contact and email                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Nutritionists                                                |
| Alcohol consumption          | Beich <i>et al.</i> (2007)             | Denmark   | To verify the applicability of a brief intervention in the significant and sustained reduction of alcohol consumption among risky drinkers in primary care services                                       | Pragmatic controlled trial                           | Pre-intervention training<br>Screening by filling in a self-completed questionnaire (usual alcohol consumption and consumption in the past week)<br>Feedback on the questionnaires followed by a brief intervention during a face-to-face consultation (for 'risk drinkers')<br>Invitation to follow up                                                                                                                                                                                                                                                                                                                                                                                         | GPs and nursing staff (experienced nurse or assistant nurse) |

(continued next page)

Table 3. (Continued)

| Theme                         | Study                          | Country of origin | Objective                                                                                                                                                                                                   | Study design                       | Outline of implementation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Health professionals                                                                                                                                 |
|-------------------------------|--------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alcohol consumption           | Clifford and Shakeshaft (2011) | Australia         | To identify the feasibility of brief interventions regarding alcohol consumption in local Indigenous communities cared for by Australian primary health care services                                       | Qualitative and quantitative study | Recognition of current practices<br>Pre-intervention training<br>Brief intervention (for 'risky drinkers')<br>Feedback from healthcare professionals and patients                                                                                                                                                                                                                                                                                                                                                                       | GPs, nurses, Aboriginal Health Workers and allied health workers (with support from clinical staff specialist in addiction medicine and researchers) |
| Alcohol consumption           | Ornstein <i>et al.</i> (2013)  | US                | To evaluate the impact and sustainability of a brief intervention model aimed at alcohol consumption among hypertensive and diabetic patients in routine primary health care                                | Randomised trial (cross-over)      | Organisation of the implementation strategy<br>Brief intervention or referral to self-help groups or specialised services ('positive screening' patients)<br>Exchange of experiences and continuous review of the implementation process<br>Screening followed by directing to a preconsultation session on a virtual platform<br>Face-to-face meeting with 'care managers' after consultation<br>Longitudinal monitoring via telephone contact                                                                                         | Physicians, nurse practitioners, physician assistants (with support from researchers)                                                                |
| Care for diabetic patients    | Glasgow <i>et al.</i> (2004)   | US                | To evaluate the effectiveness of a program to improve care for diabetic patients using an electronic tool                                                                                                   | Randomised trial                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 'Care managers' (nurses or medical assistants) and family practice physicians                                                                        |
| Care for diabetic patients    | Garza <i>et al.</i> (2017)     | US                | To increase physicians' adherence to clinical guidelines for the treatment of dyslipidaemia in diabetic patients aged 40–75 years                                                                           | Interventional study               | Recognition of current practices<br>Pre-intervention training<br>Brief intervention (with electronic alert support linked to the medical record)<br>Continuous review of the implementation process                                                                                                                                                                                                                                                                                                                                     | Family physicians and medical assistants                                                                                                             |
| Care for diabetic patients    | Vachon <i>et al.</i> (2007)    | US                | To describe the process of implementing a multifaceted program that aims to improve access to care in an urban health service and enable patients to take a more active role in controlling diabetes        | Experience report                  | Day of activities aimed at diabetes care, including moments of individual consultations with health professionals (mandatory or optional) and group activities (optional), such as cooking classes and nutrition classes<br>Filling out forms at each station to assist professionals in the intervention<br>Recognition of current practices<br>Pre-intervention training<br>Screening followed by simple dietary intervention for patients at nutritional risk/malnourished<br>Referral to community nutrition services (when needed) | GPs, medical assistants and nurses (with support from chefs, nutritionists and nutrition students living in the community)                           |
| Nutritional risk/malnutrition | Kennelly <i>et al.</i> (2010)  | Ireland           | To evaluate whether an educational program improves the knowledge and clinical practice of health professionals regarding the management of patients at nutritional risk/malnourished in community services | Quantitative study                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | GPs, practice nurses, community nurses and community dietitian (with support from the staff nurses in private nursing homes)                         |

**Table 4. Barriers to and facilitators of the implementation process**

|                                                                                           | No. studies |
|-------------------------------------------------------------------------------------------|-------------|
| Barriers for implementation                                                               |             |
| Lack of time                                                                              | 8           |
| Incompatibility of interventions with living conditions and patients' health needs        | 7           |
| Lack of resources (physical structure and/or work materials and/or financial resources)   | 7           |
| Resistance to changes in work dynamics                                                    | 6           |
| Misunderstanding of the territory and the demands of the service                          | 5           |
| Information overload and tasks given to patients                                          | 3           |
| Complex themes and cases that require more skills and deeper care                         | 3           |
| Insufficient number of employees                                                          | 3           |
| Work overload                                                                             | 3           |
| Influence of publicity and strong corporations on the consumption of ultraprocessed foods | 3           |
| Facilitators for implementation                                                           |             |
| Pre-intervention training                                                                 | 11          |
| Surveillance and operational support from specialist professionals                        | 11          |
| Interventions that are adaptable to patients' needs and the reality of the services       | 9           |
| Implementation support material                                                           | 9           |
| Involvement of a greater number of professionals, with division of tasks                  | 9           |
| Occasions for sharing learning and experiences                                            | 6           |
| Training with objective and appropriate content                                           | 6           |
| Timely intervention                                                                       | 4           |
| Recognition of the territory and practices already implemented                            | 4           |
| Better pay for taking on the task                                                         | 4           |
| Easy to apply interventions                                                               | 4           |
| Perception of patients' health needs                                                      | 4           |
| Use of digital media                                                                      | 4           |
| Low-cost interventions                                                                    | 3           |
| Interventions inserted in routine activities                                              | 3           |
| Use of playful and interactive nutrition education tools during consultations/meetings    | 3           |
| Frequent patient support (even remotely)                                                  | 3           |
| Willingness to assume functions not specific to the professional area                     | 3           |
| Professionals with a welcoming attitude (without judgement)                               | 3           |
| Training with practical activities (interactive dynamics)                                 | 3           |
| Mix of multiple implementation strategies                                                 | 3           |

structural factors (access to computers, meeting rooms, availability of educational materials), is key to forecasting possible barriers to the implementation of practices and suggesting strategies to overcome them.

The second step in the implementation process is related to the training of healthcare practitioners. [Danek et al. \(2017\)](#) and [Kahan and Manson \(2017\)](#) identified weaknesses associated with adopting nutritional management in clinical practice in PHC. Those weaknesses are linked to gaps in the training of health professionals at both the undergraduate and graduate levels, as well as to limitations of in-service training. This review also found continuing and participative educational activities for practitioners (pre-intervention training, the preparation and provision of study materials and support for implementation, moments of sharing new knowledge and skills acquired during the process) were guiding steps for the implementation process. The educational experiences based on real-world settings, applying interactive and practical activities, emerged as enablers to the enrichment of theoretical knowledge, creating conditions for the development of previously dormant or non-existent skills ([Andolsek et al. 2013](#)).

The third step in the implementation process highlighted by this review is the integration of nutritional management into

interprofessional practice. Driving forces behind the implementation of evidence-based nutritional management in PHC settings include: structuring of the implementation plan; dividing tasks between professionals from different areas, as well as members of the community; sharing practice (including other health units) experiences; and the provision of supervision and support from specialist professionals (with an emphasis on nutritionists).

According to [Brownson et al. \(2018\)](#) and [Luig et al. \(2018\)](#), successful implementation of practice in PHC also seems to be directly related to the collective perception, knowledge exchange between stakeholders, teamwork and collaborative interprofessional practice and continuous support from specialists. The implementation of nutritional management is an interprofessional practice based on the combination of different types of knowledge. Among these types of knowledge, it is key to include the knowledge and opinions of users and families as a component of the implementation process in the context of comprehensive health care ([Suter et al. 2009](#); [WHO 2010](#); [Agreli et al. 2016](#)).

The fourth and final step in the implementation process was the use of a patient-centred approach. This presupposes the active participation of the patient in the decision-making

process, horizontal communication, attentive and qualified listening and a perception of patients' willingness and readiness to get involved with the proposed interventions. There must be a reciprocal relationship between individuals in the catchment area and the health unit to which they are linked, helping to shape those health services to the users' needs under the perspective of comprehensiveness (Brownson et al. 2018).

This study has two limitations. First, we were unable to find the full-text versions of three studies that met the inclusion criteria, which meant these studies were not included in the analysis. In addition, the search strategy was limited to articles written in Spanish, Portuguese or English; this geographic scope excluded literature published in other languages.

## Conclusion

The interventions and programs related to evidence-based nutritional management implementation emerging from the 26 studies in this review address topics that are relevant to health systems worldwide, given their high prevalence among users, families and communities in most countries. These topics include weight control (overweight/obesity), infant feeding, alcohol consumption, breastfeeding, care for diabetic patients and nutritional risk/malnutrition.

It has been demonstrated that the implementation of nutritional management within PHC settings demands a broad view of the process, going beyond the boundaries of the specific nutrition management activity. It is necessary to use an implementation design that goes from pre-intervention to follow-up, using interprofessional work, a patient-centred approach and continuing education, always taking into consideration the local reality of the patients, their needs and the resources of the PHC service.

The main recommendations arising from this review are the four steps of the implementation process, which go beyond the mere dissemination of the evidence and are key for the adoption of evidence-based nutritional management in clinical practice.

## Conflicts of interest

The authors declare that they have no conflicts of interest.

## Declaration of funding

This research did not receive any specific funding.

## References

- Agreli HF, Peduzzi M, Silva MC (2016) Patient centred care in interprofessional collaborative practice. *Interface: Comunicacao, Saude, Educacao* **20**, 905–916. doi:10.1590/1807-57622015.0511
- Aguiar NA, Xavier KLS, Silva EM, Dinegri L (2017) Implementação da Estratégia Amamenta e Alimenta Brasil (EAAB) no município de Paulista-PE. (Pernambuco, Brazil) Available at <http://ecos-rednutri.bvs.br/tiki-index.php?page=experienciaamostra17> [Verified 1 July 2018]
- Andolsek K, Rosenberg MT, Abdolrasulnia M, Stowell SA, Gardner AJ (2013) Complex cases in primary care: report of a CME-certified series addressing patients with multiple comorbidities. *International Journal of Clinical Practice* **67**, 911–917. doi:10.1111/ijcp.12175
- Arksey H, O'Malley L (2005) Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology* **8**, 19–32. doi:10.1080/1364557032000119616
- Baerug A, Langsrud O, Loland BF, Tuft E, Tylleskär T, Fretheim A (2016) Effectiveness of baby-friendly community health services on exclusive breastfeeding and maternal satisfaction: a pragmatic trial. *Maternal and Child Nutrition* **12**, 428–439. doi:10.1111/mcn.12273
- Beich A, Gannik D, Saelan H, Thorsen T (2007) Screening and brief intervention targeting risky drinkers in Danish general practice – a pragmatic controlled trial. *Alcohol and Alcoholism (Oxford, Oxfordshire)* **42**, 593–603. doi:10.1093/alcalc/agn063
- Bettinelli ME, Chapin EM, Cattaneo A (2012) Establishing the baby-friendly community initiative in Italy: development, strategy, and implementation. *Journal of Human Lactation* **28**, 297–303. doi:10.1177/0890334412447994
- Blonstein AC, Yank V, Stafford RS, Wilson SR, Rosas LG, Ma J (2013) Translating an evidence-based lifestyle intervention program into primary care: lessons learned. *Health Promotion Practice* **14**, 491–497. doi:10.1177/1524839913481604
- Brown I, Psarou A (2008) Literature review of nursing practice in managing obesity in primary care: developments in the UK. *Journal of Clinical Nursing* **17**, 17–28.
- Brownson RC, Fielding JE, Green LW (2018) Building capacity for evidence-based public health: reconciling the pulls of practice and the push of research. *Annual Review of Public Health* **39**, 27–53. doi:10.1146/annurev-publhealth-040617-014746
- Cabana MD, Flores G (2002) The role of clinical practice guidelines in enhancing quality and reducing racial/ethnic disparities in paediatrics. *Paediatric Respiratory Reviews* **3**, 52–58. doi:10.1053/prrv.2002.0182
- Clifford A, Shakeshaft A (2011) Evidence-based alcohol screening and brief intervention in Aboriginal Community Controlled Health Services: Experiences of health-care providers. *Drug and Alcohol Review* **30**, 55–62. doi:10.1111/j.1465-3362.2010.00192.x
- Cloutier MM, Wiley J, Huedo-Medina T, Ohannessian CM, Grant A, Hernandez D, Gorin AA (2015) Outcomes from a pediatric primary care weight management program: steps to growing up healthy. *The Journal of Pediatrics* **167**, 372–377. doi:10.1016/j.jpeds.2015.05.028
- Corriveau SK, Drake EE, Kellams AL, Rovnyak VG (2013) Evaluation of an office protocol to increase exclusivity of breastfeeding. *Pediatrics* **131**, 942–950. doi:10.1542/peds.2012-1310
- Danek RL, Berlin KL, Waite GN, Geib RW (2017) Perceptions of nutrition education in the current medical school curriculum. *Family Medicine* **49**, 803–806.
- Ewing LJ, Cluss P, Goldstrohm S, Ulrich R, Colborn K, Cipriani L, Wald ER (2009) Translating an evidence-based intervention for pediatric overweight to a primary care setting. *Clinical Pediatrics* **48**, 397–403. doi:10.1177/0009922808330109
- Fontoura JS, Freitas JC, Kayser MT, Mata B (2015) Implementação e Certificação da Estratégia Amamenta e Alimenta Brasil (EAAB) no município de Gravataí-RS. (Gravataí, Brazil) Available at <http://ecos-rednutri.bvs.br/tiki-index.php?page=experienciaamostra18> [Verified 1 July 2018]
- Gabrielli S, Dianti M, Maimone R, Betta M, Filippi L, Ghezzi M, Forti S (2017) Design of a mobile app for nutrition education (TreC-LifeStyle) and formative evaluation with families of overweight children. *JMIR mHealth and uHealth* **5**, e48. doi:10.2196/mhealth.7080
- Garza L, Dols J, Gillespie M (2017) An initiative to improve primary prevention of cardiovascular disease in adults with type II diabetes based on the ACC/AHA (2013) and ADA (2016) guidelines. *Journal of the American Association of Nurse Practitioners* **29**, 606–611. doi:10.1002/2327-6924.12492
- GBD 2017 Diet Collaborators (2019) Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet* **393**, 1958–1972. doi:10.1016/S0140-6736(19)30041-8
- Glasgow RE, Nutting PA, King DK, Nelson CC, Cutter G, Gaglio B, Rahm AK, Whitesides H, Amthauer H (2004) A practical randomized trial to

- improve diabetes care. *Journal of General Internal Medicine* **19**, 1167–1174. doi:10.1111/j.1525-1497.2004.30425.x
- Hernández-Aguilar MT, Lasarte-Velillas JJ, Martín-Calama J, Flores-Antón B, Borja-Herrero C, García-Franco M, Navas-Lucena V, Pallas-Alonso C (2014) The baby-friendly initiative in Spain: a challenging pathway. *Journal of Human Lactation* **30**, 276–282. doi:10.1177/0890334414531453
- Huseinovic E, Bertz F, Agelii ML, Johansson EH, Winkvist A, Brekke HK (2016) Effectiveness of a weight loss intervention in postpartum women: results from a randomized controlled trial in primary health care. *The American Journal of Clinical Nutrition* **104**, 362–370. doi:10.3945/ajcn.116.135673
- Inglis NJ, Docherty A, Pryke R (2010) Evaluation of the 'Mealtime Magic' brief leaflet-based intervention in general practice. *Primary Health Care Research and Development* **11**, 166–179. doi:10.1017/S1463423609990326
- Kahan S, Manson JE (2017) Nutrition counseling in clinical practice: how clinicians can do better. *Journal of the American Medical Association* **318**, 1101–1102. doi:10.1001/jama.2017.10434
- Kennelly S, Kennedy NP, Rughoobur GF, Slattery CG, Sugrue S (2010) An evaluation of a community dietetics intervention on the management of malnutrition for healthcare professionals. *Journal of Human Nutrition and Dietetics* **23**, 567–574. doi:10.1111/j.1365-277X.2010.01111.x
- Labarere J, Gelbert-Baudino N, Ayral AS, Duc C, Berchotteau M, Bouchon N, Schelstraete C, Vitzo J-P, Francois P, Pons J-C (2005) Efficacy of breastfeeding support provided by trained clinicians during an early, routine, preventive visit: a prospective, randomized, open trial of 226 mother-infant pairs. *Pediatrics* **115**, e139–e146. doi:10.1542/peds.2004-1362
- Little P, Stuart B, Hobbs FR, Kelly J, Smith ER, Bradbury KJ, Hughes S, Smith PW, Moore MV, Lean ME, Margetts BM, Byrne CD, Griffin S, Davoudianfar M, Hooper J, Yao G, Zhu S, Raftery J, Yardley L (2016) An internet-based intervention with brief nurse support to manage obesity in primary care (POWeR+): a pragmatic, parallel-group, randomised controlled trial. *The Lancet. Diabetes & Endocrinology* **4**, 821–828. doi:10.1016/S2213-8587(16)30099-7
- Luig T, Asselin J, Sharma AM, Campbell-Scherer DL (2018) Understanding implementation of complex interventions in primary care teams. *Journal of the American Board of Family Medicine* **31**, 431–444. doi:10.3122/jabfm.2018.03.170273
- Micha R, Shulkin ML, Penalvo JL, Khatibzadeh S, Singh GM, Rao M, Fahimi S, Powles J, Mozaffarian D (2017) Etiologic effects and optimal intakes of foods and nutrients for risk of cardiovascular diseases and diabetes: systematic reviews and meta-analyses from the Nutrition and Chronic Diseases Expert Group (NutriCoDE). *PLoS One* **12**, e0175149. doi:10.1371/journal.pone.0175149
- Mueller K (2015) Implementation of a lactation support program in a primary care pediatric practice. *Infant, Child & Adolescent Nutrition* **7**, 323–327. doi:10.1177/1941406415610194
- Oliveira NLZ, Agreli HLF, Matsumoto KS, Peduzzi M (2018) Mapping the implementation of evidence-based nutritional management in primary health care settings: a scoping review protocol. *JBIC Database of Systematic Reviews and Implementation Reports* **16**, 1167–1173. doi:10.1177/1941406415610194
- Ornstein SM, Miller PM, Wessell AM, Jenkins RG, Nemeth LS, Nizetert PJ (2013) Integration and sustainability of alcohol screening, brief intervention, and pharmacotherapy in primary care settings. *Journal of Studies on Alcohol and Drugs* **74**, 598–604. doi:10.15288/jsad.2013.74.598
- Sargent G (2011) Development of an evidence-based intervention for the treatment of overweight and obese children in general practice. PhD thesis, University of New South Wales.
- Schwartz R, Ellings A, Baisden A, Goldhammer CJ, Lamson E, Johnson D (2015) Washington 'steps' up: a 10-step quality improvement initiative to optimize breastfeeding support in community health centers. *Journal of Human Lactation* **31**, 651–659. doi:10.1177/0890334415591147
- Shaikh U, Nettiksimmons J, Joseph JG, Tancredi D, Romano PS (2014) Collaborative practice improvement for childhood obesity in rural clinics: the Healthy Eating Active Living Telehealth Community of Practice (HEALTH COP). *American Journal of Medical Quality* **29**, 467–475. doi:10.1177/1062860613506252
- Souza KA, Santos JJB, Valladares R (2017a) Projeto Mama Nenê. (Canoas, Brazil) Available at <http://ecos-redenutri.bvs.br/tiki-index.php?page=experienciamostra13> [Verified 1 July 2018]
- Souza NP, Lira PIC, Fontbonne A, Pinto FCL, Cesse EAP (2017b) A (des)nutrição e o novo padrão epidemiológico em um contexto de desenvolvimento e desigualdades. *Ciência & Saude Coletiva* **22**, 2257–2266. doi:10.1590/1413-81232017227.03042017
- Suter E, Arndt J, Arthur N, Parboosingh J, Taylor E, Deutschlander S (2009) Role understanding and effective communication as core competencies for collaborative practice. *Journal of Interprofessional Care* **23**, 41–51. doi:10.1080/13561820802338579
- The Counterweight Project Team (2004) A new evidence-based model for weight management in primary care: the counterweight programme. *Journal of Human Nutrition and Dietetics* **17**, 191–208. doi:10.1111/j.1365-277X.2004.00517.x
- Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, Moher D, Peters MDJ, Horsley T, Weeks L, Hempel S, Akl SE, Chang C, McGowan J, Stewart L, Hartling L, Aldcroft A, Wilson MG, Garrity C, Lewin S, Godfrey CM, Macdonald MT, Langlois EV, Soares-Weiser K, Moriarty J, Clifford T, Tunçalp O, Straus SE (2018) PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Annals of Internal Medicine* **169**, 467–473. doi:10.7326/M18-0850
- Vachon GC, Ezike N, Brown-Walker M, Chhay V, Pikelny I, Pendergraft TB (2007) Improving access to diabetes care in an inner-city, community-based outpatient health center with a monthly open-access, multistation group visit program. *Journal of the National Medical Association* **99**, 1327–1336.
- World Cancer Research Fund (2018) Diet, Nutrition, Physical Activity and Cancer: A Global Perspective. (American Institute for Cancer Research: Arlington, VA, USA) Available at <https://www.wcrf.org/sites/default/files/Summary-of-Third-Expert-Report-2018.pdf> [Verified 15 January 2020]
- World Health Organization (WHO) (2008) The World Health Report 2008: Primary Health Care – Now More Than Ever. (WHO: Geneva, Switzerland) Available at [http://www.who.int/whr/2008/whr08\\_en.pdf](http://www.who.int/whr/2008/whr08_en.pdf) [Verified 1 July 2017]
- World Health Organization (WHO) (2010) Framework for action on interprofessional education & collaborative practice. (WHO: Geneva, Switzerland) Available at [http://apps.who.int/iris/bitstream/10665/70185/1/WHO\\_HRH\\_HPN\\_10.3\\_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/70185/1/WHO_HRH_HPN_10.3_eng.pdf?ua=1) [Verified 12 December 2017]