

# BMJ Open Mapping the national evidence on double burden of malnutrition in Ethiopia: a protocol of scoping review

Lemma Getacher <sup>1,2</sup>, Beyene Wondafrash Ademe,<sup>2</sup> Tefera Belachew <sup>2</sup>

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<sup>1</sup>Department of Nutrition, School of Public Health, College of Medicine and Health Science, Debre Berhan University, Debre Berhan, Ethiopia

<sup>2</sup>Department of Nutrition and Dietetics, Faculty of Public Health, Institute of Health, Jimma University, Jimma, Ethiopia

## Correspondence to

Lemma Getacher;  
lemmagetacher@gmail.com

## ABSTRACT

**Introduction** Currently, the double burden of malnutrition (DBM) is an emerging public health problem due to the inevitable consequences of nutritional transition. An increasing number of studies have reported the DBM in Ethiopian populations. However, organised and summarised national evidence is not yet available. Therefore, the main aim and research question of this scoping review is to map the national evidence on the DBM in the last decades in Ethiopia.

**Methods** This scoping review will be mapping the national evidence on the DBM in different population groups of Ethiopia including all ages and both sexes from 1 January 2021 to 30 September 2021. The *Joanna Briggs Institute Reviewer's Manual* will be used as the methodology of review for this review. The search strategy will be conducted using electronic databases such as PubMed, ScienceDirect, Cochrane Library, Wiley Online Library, Google Scholar, and grey literature sources and reference lists of key studies to identify studies appropriate for inclusion in the review. Two independent reviewers will be screened independently with all abstracts and full-text studies for inclusion. Data will be abstracted into tables and logically organised according to the items addressed in the specific research questions.

**Ethics and dissemination** The data will be used from publicly available secondary sources. Therefore, no ethical review and approval will be required for this review. Dissemination of results will be sought through peer-reviewed publications, conference presentations and stakeholder meetings. Regarding registration, this review protocol is registered on the figshare website on 28 February 2021, with the DOI number <https://doi.org/106084/m9figshare14131874>.

## INTRODUCTION Background

The double burden of malnutrition (DBM) is the coexistence of undernutrition (stunting, wasting, underweight and micronutrient deficiency) and overnutrition (overweight, obesity and diet-related non-communicable diseases (NCDs)) at the individual, household, national and international levels simultaneously. Nowadays, it is an emerging public health problem that occurs due to the inevitable consequences of nutritional transition.<sup>1 2</sup>

## Strengths and limitations of this study

- This scoping review will focus on the double burden of malnutrition (DBM) in a general population including children under 5 years of age, pregnant women, lactating mothers, adolescents and older populations.
- This scoping review is expected to provide an overview of the overall findings on DBM in Ethiopia and to pursue recommendations for future research.
- This is the first scoping review protocol on the topic of DBM for collating and summarising relevant published scientific evidence in a nationwide context.
- This scoping review will include studies that have either undernutrition or overnutrition and/or both undernutrition and overnutrition outcomes among the above-explained population groups in the country.
- This review will be limited to the English language with the interest of time and resources.

DBM is the two sides of a crisis that has vast health, environmental, economic, social and political implications, which affects every country of the world in its form. Worldwide, approximately one in three people and one in nine people are suffering from at least one form of undernutrition such as stunting, underweight, wasting, vitamin and mineral deficiencies, and overweight or obesity and diet-related NCDs, respectively.<sup>1 3</sup>

Approximately 462 million adults worldwide were underweight, 1.9 billion adults (>18 years) were either overweight or obese, 41 million children under the age of 5 years were overweight or obese, and 155 million children under 5 years of age were chronically undernourished. As a result, nearly 45% of deaths among children under 5 years of age are contributing to nutrition-related factors, majorly by undernutrition. Moreover, low-income and middle-income countries are now suffering from a simultaneous increase in childhood overweight.<sup>1 3-8</sup>

As various evidences show that DBM is one of the increased nutritional problems in all population groups as a life course problem.

A study done in South Africa among mothers of primary school children showed that the prevalence of underweight, overweight and obesity was 2%, 27% and 42%, respectively.<sup>9</sup> Another study in Egyptian primary school children stated that the prevalences of thinness, overweight and obesity were 4.5%, 11% and 8.2%, respectively.<sup>10</sup> In a nutshell, several studies conducted in the global countries among children showed that DBM ranges from 5.6% to 49.8%<sup>4 11–14</sup> whereas in African countries DBM ranges from 15.7% to 54.2%.<sup>11 15 16</sup>

Nutrition transition, a process of shifting from highly prevalent undernutrition to largely prevalent overnutrition, has become a major contributor to DBM in this world. This is related to the shifting of dietary patterns from high carbohydrate food to high fat food that has been found to largely coincide with rising rates of obesity and NCDs.<sup>17 18</sup> Previously, the dominant consumed food types were carbohydrate type of foods, such as cereals and grains. Hence, foods made from cereals and grains, such as spaghetti, pasta, white bread, whole wheat bread, white rice, barley, oatmeal, waffle and so on, are high in carbohydrates. However, nowadays, due to the effect of globalisation and nutrition transition, most of the food types are dominated by fat such as frequently eating junk foods, fast food meals, cakes and pastries, sweets, processed meats, and sugary drinks.<sup>16–18</sup>

The key to prevention of diet-related diseases is to provide a better understanding of the shifts in dietary patterns and its drivers across populations. Worldwide, poor diet (either excess or inadequate intake) is the leading cause of mortality and morbidity exceeding the burdens attributable to many other major global health challenges.<sup>1 17 18</sup> Of the most important contributing factors behind the global pandemic of obesity, unhealthy diets composed of foods that are dense in energy, fat, sugar and salt are the most common.<sup>18</sup>

According to a systematic scoping review conducted in SSA, the major risk factors of childhood obesity were parental economic status, sex of the child, urban residence, consumption of highly refined/processed foods, snacks and sweetened beverages, parental level of education, age, low level of physical activity (sedentary lifestyle), attending private or public school, maternal obesity, screen time, birth weight, household size, stature, smoking, and loneliness. In addition, this study also identifies the common morbidities and comorbidities associated with childhood obesity/overweight. The most common morbidities and comorbidities associated with childhood obesity/overweight were hypertension (elevated blood pressure), dyslipidaemia, type 2 diabetes mellitus, iron deficiency anaemia, hypertriglyceridemia, vitamin D deficiency, parental diabetes status and low High-density lipoprotein (HDL) cholesterol.<sup>19</sup>

The world community aims to reduce malnutrition in all its forms, including overweight and obesity by 2030 through Sustainable Development Goals. The achievement of this objective is highly unlikely in the next few

years before that date without a miracle, because its current achievement is very slow.<sup>20 21</sup>

As the name indicates, the scoping review is an ideal approach/tool for exploring and describing the scope or coverage of a body of literature on a given topic (DBM in this review) and provides a clear indication of the volume of studies available and an overview, both broad and detailed, of its focus.<sup>22–24</sup> The major indications of this scoping review are to identify the types of available evidence on DBM, clarify the key concepts/definitions of DBM, examine how research is conducted on DBM, identify key characteristics or factors related to DBM, as a precursor to a systematic review of DBM, and identify and analyse knowledge gaps in DBM in the country.<sup>22 25–27</sup>

### Study rationale

A national overview of the evidence on DBM would provide an important basis for understanding how DBM was studied in Ethiopia. At a glance, in Ethiopia, the prevalence of DBM ranges from 1.99% to 57.7%. More specifically, the prevalence of stunting ranges from 26.6% to 57.7%, wasting ranges from 3.2% to 16.7%, underweight ranges from 11.9% to 24.5%, and overweight/obesity ranges from 1.99% to 42%.<sup>28–42</sup> Even though little reduction in undernutrition exists, the increment of overnutrition among all populations of Ethiopia is another double burden and the summarised figure is not known.

The rationale of this review is to identify the existing knowledge gaps and recommend future research. The findings of this scoping review will rigorously provide a pattern, trend, summarise and conceptual framework for researching DBM. Ultimately such research findings will bring important insights for guiding policies, interventions and strategies aimed at reducing undernutrition, overnutrition and diet-related NCDs.

While several studies have been published on DBM, they are focused either on evidence from a specific population or on a subnational area. The national evidence on DBM has not been summarised so far on this issue. To the best of our knowledge, this scoping review will be the first to assess shreds of published on DBM nationally. Hence, now we propose a protocol of a scoping review aimed to summarise and collate the overall findings on the national evidence including all ages and sexes. We also hope that this work will help future researchers and bring an essential contribution to the field of nutrition.

Furthermore, DBM is a term used to identify a complex phenomenon (both undernutrition and overnutrition, several types of drivers of both) and the key concepts and definitions used in the literature require better clarification. Especially, it remains important to evaluate how research has been conducted on DBM in Ethiopia. Therefore, it has been proposed that conducting a scoping review on DBM would allow a better understanding of the patterns, trends, and determinants of DBM and provide a framework for further future research.

## Study objectives

A scoping review will be carried out to systematically map research findings investigating DBM in Ethiopia. Therefore, the main aim of this proposed scoping review is to summarise and map the national evidence on DBM during the last decades in Ethiopia.

## Research questions

The research questions of this scoping review will take into consideration the population, concept and context (PCC). This review will address the following research questions:

### Main question

- ▶ What is the national evidence on DBM in the different population groups of Ethiopia (from birth to old age) as a life course perspective?

### Subresearch questions

- ▶ What is the prevalence of DBM reported in different population groups of Ethiopia?
- ▶ Is there a regional/subnational difference in double burden malnutrition in Ethiopia?
- ▶ What seems to be the trend of double burden malnutrition in Ethiopia?
- ▶ What are the main gaps in the existing kinds of literature and directions for further future research?

## METHODS

### Protocol design

Before designing the protocol of this scoping review, first, we have checked whether a scoping review on DBM is available or not through various databases and protocol registral websites. We checked it on protocol registration websites such as PROSPERO, Open Science Framework and figshare for any registered scoping reviews yet to be conducted. Consequently, there are no previously published scoping reviews on DBM in Ethiopia. Besides, this protocol was registered with the figshare registrar organisation with the DOI number <https://doi.org/10.6084/m9figshare14131874>.

The protocol of this scoping review will be guided and developed using the scoping review tools of different scholars and the Joanna Briggs Institute.<sup>22 23 43 44</sup> Furthermore, the draft of the protocol was revised on receiving feedback from the research team. During protocol preparation, an article search will be done using keywords and index terms from 1 January 2021 to 30 September 2021.

After that, all eligible references will be imported to Mendeley desktop software V.1.19.5 and duplicates will be removed followed by title screening accordingly. Next, we will be performing an abstract screen for eligibility of the articles. Articles that will meet the priority criteria will be undergoing full review. Extraction of data will be taking place and analysis of the results will be done through the use of narrative analysis. The protocol will be guided by the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist guidelines.<sup>45</sup>

## Box 1 Inclusion criteria of the scoping review

- ▶ To allow a better understanding of DBM patterns, trends and driver factors across populations, all age groups and both sexes will be included in the review.
- ▶ To get the appropriate trend and pattern of DBM, all dates of publication will be included.
- ▶ To get global audiences and readers, we include studies written in the English language.
- ▶ To get an appropriate knowledge base, any article type will be reviewed.

## Eligibility criteria

To determine the eligibility criteria for this review, the PCC strategy/approach will be considered.

**Population:** The selected populations of this review will be all age groups as a life course approach (children under 5 years, school children, adolescents, pregnant women, breastfeeding women, adult population and older population) for both sexes.

**Concept:** The focus of this review will be on DBM (undernutrition and overnutrition that means overweight and obesity).

**Context:** The context of this review will be Ethiopia as a whole and its subnational states or regions.

## Inclusion criteria

The inclusion criteria of the reviews are explained below in detail with the rationale behind each criterion (box 1).

## Exclusion criteria

The exclusion criteria of the reviews are explained below in detail with the rationale behind each criterion (box 2).

## Search strategy

Regarding the search strategy, published and unpublished (grey) literatures will be searched through advance search using several online databases such as PubMed, ScienceDirect, Cochrane Library, Wiley Online Library, Google Scholar and Google. The identified kinds of literatures will be screened based on their title, abstracts and key terms. The search terms included DBM, dual burden of malnutrition, nutrition transition, malnutrition, undernutrition, and overnutrition, micronutrient deficiencies and overweight and obesity, underweight and overweight and obesity, and obesity (online supplemental annex 1).

After that, a full assessment of papers that meet the inclusion and exclusion criteria will be retrieved. Reference lists

## Box 2 Exclusion criteria of the scoping review

- ▶ To address DBM in the best way, studies that have no outcomes in either undernutrition or overnutrition will be excluded.
- ▶ To avoid duplication of data, papers with no appropriate original data will be excluded.
- ▶ Since we are conducting a quantitative comparison and summary of studies, studies of a narrative style review with no secondary quantitative data will be excluded.

of all included literature and excluded reviews will be additionally searched for any further relevant literature. To allow appraisal of possible publication bias, identified articles that have been published in languages other than English will be counted. No limitations will be set for the publication period. Mendeley desktop V.1.19.5 will be used as the reference management software to assist in the organisation and abstraction of data.

### Sources and selection of evidences

As it is explained above in the inclusion criteria section, for the aim of this scoping review, the source of information can include any existing literature such as primary research studies, systematic reviews, meta-analyses, letters, guidelines, websites, blogs, commentaries and scoping reviews among others. To appropriately select the source of evidence, the protocol will be developed and based on six basic steps. These are identifying research questions, identifying relevant studies, selection of eligible studies, data abstraction and charting of results, data summary, and synthesis of.<sup>46</sup> The detail of each step during the selection of evidences and sources is explained below.

#### Step 1: Identifying research questions

As explained above in the Research questions section, the main research question takes into account the PCC strategy/approach.

#### Step 2: Identifying relevant studies

Based on the eligibility criteria, the relevant studies will be selected and searched from online databases using key terms and appropriate search strategies. During this time, there will be no timeframe restrictions for studies to get the available evidence.

#### Step 3: Selection of eligible studies

Before directly screening the studies, we will be conducting a calibration exercise with all reviewers to ensure reliability. Randomly, in our search, 10% of the citations as a sample will be screened independently by all reviewers. If the agreement is greater than 90%, we will be beginning our article screening for review. Any conflicts which will occur in between will be resolved through peer discussion.

To identify the potentially eligible studies, the study selection method will be used as an elimination process based on title, abstract, key terms and full articles in ascending order by two independent reviewers. The selected results will be compared and consolidated through consensus between the two researchers. The final list of included articles will be further reviewed among the authors. Any disagreement on the final papers to be included will be discussed and an agreement will be arrived at through consensus by all authors. The PRISMA-ScR guidelines were used to present the number of included and excluded articles through a flowchart.<sup>44</sup>

### Data abstraction and charting of results

Once the selection of studies has been completed, two researchers will independently conduct the data abstraction.

If any discrepancies have occurred between the two data extractors in the data abstraction process, they will be solved through further discussion. The abstracted data will be charted in a table including, but not limited to, authors, publication year, region, study design, sample size, population group, duration of the study period, outcomes measured and main findings. Then, this abstracted data will be used for the synthesis of findings in a narrative analysis form.

### Analysis of the evidence

In this scoping review, we will be analysing the evidence descriptively and narratively to map the national evidence to DBM using narrative synthesis and content analysis.

### Presentation of the results

The presentation of the results will be conducted using tables, charts and figures. The summary of the findings will provide an overview of the research conducted on DBM nationally. Data will be summarised both qualitatively (eg, overall summary of evidence) and quantitatively (eg, the proportion of subnational covered based on population). The key concepts and characteristics of the collected articles in the data extraction table will be summarised and finalised. To best capture the key characteristics of the published papers, the synthesised results may be further developed based on the findings of the scoping review.

### Ethics and dissemination

Results from this scoping review will be published in a relevant peer-reviewed journal and presented at conferences. Because the sources of the data are based on the collection of publicly available data and due to the nature of the study, ethics approval is not required for this study.

### Patient and public involvement

There are no participants (patients or public) who will be participating in this scoping review.

**Contributors** LG developed the protocol, research questions and methodology of the review. TB and BWA contributed to offering invaluable insight, comments, refinement and editing of the protocol. Besides, all authors are involved in the process of conception, preparation and approval of the final protocol of the manuscript.

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#### ORCID iDs

Lemma Getacher <http://orcid.org/0000-0002-9237-117X>

Tefera Belachew <http://orcid.org/0000-0001-5455-9457>

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