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### ► To cite this version:

Sécolène Fleury, Paul Tronchon, Juliane Rota, Charlotte Meunier, Oliver Mardiros, et al.. The nutritional issue in older people with home-delivered meals: a scoping review protocol. 2020. hal-02901422

**HAL Id: hal-02901422**

**<https://hal.science/hal-02901422v1>**

Preprint submitted on 17 Jul 2020

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# **THE NUTRITIONAL ISSUE IN OLDER PEOPLE WITH HOME-DELIVERED MEALS: A SCOPING REVIEW PROTOCOL**

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## **Keywords**

Aged, older adults, meal-on-wheel, malnutrition, food intake, body weight

## **Abstract**

Setting up a home-delivered meal service often allows older people suffering from physical and/or cognitive disabilities to stay at home. However, older people who delegate their food activities (food purchasing, cooking...) have been reported to have a worse nutritional status than people who take care themselves of their food activities. In this context, we will conduct a scoping review of all studies related to the nutritional issue in home-delivered meal older recipients. This review was expected i. to shed light on the nutritional status of older people who benefit from home-delivery service to better understand their needs, and ii. to evaluate if home-delivered meal service can be a relevant and effective lever to preserve or improve the nutritional status of older people. The present paper describes the protocol that will be carried out to achieve this review.

## **Introduction**

Home-delivered meal services for older adults and/or disabled people were introduced in the United Kingdom during the Second World War, providing meals for people who could no longer prepare food for themselves. Subsequently, this type of service spread first to the United States, Ireland, Australia, and then more generally to the other industrialized countries (Kaplan & Williams, 1961; Williams, 1959). In the Netherlands, home-delivered meal services remain essentially a niche market because it is not funded, either by health insurance or by social funds. Conversely, in the United States, home-delivered meal services mainly concern elderly people with financial difficulties and is funded under the Older Americans Act (OAA) (Denissen et al., 2017). Finally, in emerging countries such as Korea and Hong Kong, it is most common to make delivery of fresh products to the elderly (Park & Son, 2007). In the future, demands to this services that enable seniors to remain residing in their homes can be expected to increase. Indeed, numerous countries in the world are experiencing a tremendous increase of the older population, and notably an increase of the “very old” population, namely people aged 80 or over. The number of 80 and over is expected to increase from 126 million in 2015 to 202 million in 2030 and 425 million in 2050 (United Nation, 2017). These “very old” people are also the ones who present the poorest health and accumulate the severest disabilities. Consequently, they are more likely to ask support from care services. More recently, the lockdown due to the Covid pandemia led to an explosion in home-delivered meal service demand in major French cities and probably elsewhere in the world.

Couple of authors have pointed out that elderly people who delegate their food activities (food purchasing, cooking...) have a worse nutritional status than people who take care themselves of their food activities. Maitre et al., (2014) observed at home that the proportion of elderly people who were at risk of undernutrition was 8% for autonomous persons, 16% for persons receiving non-food related help and 46% for persons receiving food related help. Crichton et al., (2018)’s meta-analysis showed that older people receiving homecare services display the highest malnutrition prevalence of all the community-dwelling elderly sample studied.

In this context, the purpose of the present study was to conduct a scoping review of all studies related to the nutritional issue in home-delivered meal older recipients. This review was expected i. to shed light on the nutritional status of older people who benefit from home-delivery service to better understand their needs, and ii. to evaluate if home-delivered meal

service can be a relevant and effective lever to preserve or improve the nutritional status of older people.

## **Methods**

Our scoping review will follow the approach proposed by Arksey & O'Malley, (2005) as well as the methodology manual published by the Joanna Briggs Institute (Peters et al., 2015). This methodology summarizes the evidence available on a topic in order to convey the breadth and depth of that topic. The protocol will be drafted using the Preferred Reporting Items for Systematic Reviews and Meta-analysis Protocols (PRISMA-P; Shamseer et al., 2015).

### **Research question**

The research question for this review is: “What are the objectives, characteristics and results of existing research conducted on the nutritional issue among older people receiving home-delivered meals (also known as meals-on-wheels)”.

### **Eligibility criteria**

The PICOS (Population, Intervention, Comparator, Outcome, Study design) eligibility criteria will be as follows (Stone, 2002):

*Population.* Only older adults living at home and receiving home-delivered meal services will be eligible. We will exclude from the review: (1) studies on older people residing at nursing homes or in the hospital, and (2) studies that not display specific data and results for home-delivered meal recipients (*e.g.* studies that display results from a mixed sample including home-delivered meal recipients and recipients of other care services such as home helper or congregate meals).

*Intervention.* Any nutritional intervention will be relevant for inclusion (*e.g.* studies providing additional food items to regular meals-on-wheels, or studies providing dietary guidance). In addition, studies without an intervention (*e.g.* observational studies) will be eligible for inclusion. Any intervention targeting specific disease rehabilitation will be excluded (*e.g.* intervention targeting patients with hypertension, diabetes, cancer).

*Comparators.* Any comparator will be relevant for inclusion (e.g. studies comparing home-delivered meal recipients with non-recipients, or studies comparing two types of home-delivered meal services). In addition, studies without a comparator will be eligible for inclusion.

*Outcomes.* Two categories of outcomes associated will be considered: (1) characterization of the nutritional status (e.g. Body Mass Index – BMI, weight, undernutrition) and (2) characterization of the nutritional intake (e.g. dietary pattern, nutrient intake).

*Study design.* All type of study design including observational and interventional design as well as all period of times and duration of follow-up will be eligible.

*Others.* No restriction on the date of publication will be made. Given the 6-month timeline, only publications written in English will be considered for inclusion. Conference abstracts, editorials, narrative review, and non-scientific literature (e.g. articles on websites) will be excluded.

### **Information sources and search strategy**

After repeated attempts and adjustments, a search strategy combining both thesaurus and free-text terms was developed to retrieve articles of interest in the following databases: PubMed, Web of Science (WOS) and EMBASE (Supplementary File 1). Separate title, abstract, and keywords searches will be conducted for older people, home-delivered meal service and nutritional outcomes on 2020, June. The results for the three separate search strings will be combined to identify relevant titles. Afterwards, references from primary selected articles, reviews and systematic reviews will be checked manually for further screening in case they were not identified during the whole search process. After removing the duplicates, titles, abstracts and full texts will be screened by two independent reviewers against the agreed inclusion and exclusion criteria. For each screening level, a training exercise will be conducted prior to the starting of the screening process on a random sample of 50 titles (level 1 screening), 20 abstracts (level 2 screening) and 10 full-text (level 3 screening) to ensure high inter-reviewer reliability. Disagreements between reviewers will be resolved by consensus or by consulting a third reviewer. The reasons for exclusion will be recorded at the full-text stage.

## **Charting the data**

A standardized data abstraction form was developed a priori and revised, as needed, after the completion of a training exercise completed on a sample of 5 articles. All included studies will be abstracted by two reviewers, independently, with conflicts resolved by a third reviewer. The data abstraction form will include the following items:

- Article identifiers (authors, year of publication)
- Study identifiers (objective, design, country)
- Population (age, gender, sample size, inclusion and exclusion criteria)
- Intervention (if applicable)
- Comparator (if applicable)
- Outcomes (endpoints, measurement method, main results)

## **Collating, summarizing and reporting the results**

A descriptive numerical summary of the included studies' characteristics will be performed. Tables and graphs will be created to reflect the overall number of studies included, study designs and settings, publication years, the characteristics of the study populations, the outcomes reported, and the countries where the studies were conducted. In line with scoping reviews' methodology, an assessment of the quality of the included studies will not be performed (Peters et al., 2015).

## **Results and discussion**

After conducting a descriptive summary of the collected studies related to the nutritional issue of home-delivered meal recipients, the four following topics are expected to be addressed:

- Characterization of the nutritional status (nutritional risk and food intake) of older home-delivered meal recipients. Specifically, what is the range and the average undernutrition prevalence in this population?
- Evolution over time of the nutritional status of older home-delivered meal recipients: does the nutritional status of home-delivered meal recipients improve, remain stable or worsen over time?

- Comparison of home-delivered meal recipients with non-recipients: does receiving home-delivered meal provide a nutritional benefit compared to when home-delivered meal is not received?
- Improvement of home-delivered meal service: which nutritional intervention are effective to improve the nutritional status of home-delivered meal recipients?

A preliminary literature inquiry has led to the identification of four systematic literature reviews close to the scope of the present review. The systematic review of Campbell et al., (2015) targeted all studies related to home-delivered meal and included 80 articles. This literature review, which is closer to a scoping review than a systematic review, did not focus on older adults (the review included studies on people aged 45+ years). Included articles were sorted according to their experimental design (*e.g.* cross-sectional descriptive studies of home-delivered meal recipients, pre-post assessment of home-delivered meal program, randomized controlled trials, data mining in private and public report), each design including various outcomes (*e.g.* satisfaction, food insecurity, nutritional outcomes, health outcomes, care expenditures). Campbell et al., (2015) provided few conclusions about the nutritional issue in home-delivered meal recipients. Rather, they provided a detailed overview of the different types of studies that have been conducted on home-delivered meal services and recipients. The authors also discussed the key issues that deserve further researches on home-delivered meal services.

Two systematic literature reviews are in line with our third question (comparison of home-delivered meal recipients with non-recipients). The one of Zhu & An, (2013) was restricted to studies conducted in the USA, in relationship with the Older Americans Act. This review concluded that the US home-delivered meal programs actually improve diet and increase nutrient intakes among recipients. The recent review of Walton et al., (2020) assessed the impact of receiving meals services on nutritional intake compared to when no meal services are received in older adults living at home. In this review, meal services were not restricted to home-delivered meals, but also included congregate meals. The results highlighted a positive impact of home-delivered meals on energy and protein intake in older adults. However, this review did not explore the impact of meal services on the nutritional status and the undernutrition risk among the older population.

Finally, the systematic literature review of IJmker-Hemink et al., (2020) explored the effectiveness of various interventions to improve nutrition and satisfaction outcomes in adults receiving home-delivered meals. This review led to the identification of 12 studies assessing the impact of an improved home-delivered meal service on nutritional outcomes (14 assessed satisfaction outcomes). This review is very close to our fourth question and will definitively pave the way to answer this question in the present scoping review.

## ACKNOWLEDGMENT

This study is part of the PhD work of Ségolène Fleury, funded by a CIFRE contract between the company Saveurs et Vie and the French Association Nationale Recherche Technologie (ANRT N°1576).

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**Supplementary File 1.** Search strategy (For PubMed and EMBASE, thesaurus terms are in bold).

### **Older people**

**'Aged'** OR 'Elderly' OR 'elderlies' OR 'older' OR 'elder' OR 'third age' OR 'senior' OR 'aging' OR 'ageing' OR 'old person' OR 'old people' (PubMed, WOS)

**'Aged'** OR 'aged patient' OR 'aged people' or 'aged person' OR 'aged subject' OR 'elderly' OR 'elderly patient' OR 'elderly people' OR 'elderly person' OR 'elderly subject' OR 'senior citizen' OR 'senium' (EMBASE)

AND

### **Home delivered meal**

'Meal on the wheel' OR 'meal on wheel' OR 'meals on wheels' OR 'food portage' OR 'food delivery' OR 'food deliveries' OR 'delivered food' OR 'meal delivery' OR 'meal deliveries' OR 'delivered meal' OR **'food service'** OR **'home care service'** OR 'home meal services' (Pubmed, WOS)

**'Home delivered meal'** OR 'home delivered meal' OR 'home delivery meal' OR 'meal on wheels' OR 'meals on wheels' OR **'home care'** OR 'domiciliary care' OR 'home care' OR 'home care agencies' OR 'home care program' OR 'home care programme' OR 'home care service' OR 'home care services' OR 'home health care' OR 'home health nursing' OR 'home help' OR 'home nursing' OR 'home service' OR 'homecare' OR 'homemaker services' OR 'home care services, hospital-based' (EMBASE)

AND

### **Nutritional outcomes**

**'Nutritional status'** OR **'Body weight'** OR 'weight' OR **'Body Mass Index'** OR 'BMI' OR 'muscle mass' OR 'muscular mass' OR 'undernutrition' OR 'undernourished' OR **'malnutrition'** OR 'malnourished' OR 'denutrition' OR **'appetite'** OR 'diet pattern' OR 'dietary pattern' OR 'food intake' OR 'nutritional intake' OR 'protein intake' OR **'energy intake'** OR 'calories intake' (PubMed, WOS)

**'Body weight'** OR 'body weight' OR 'total body weight' OR 'weight, body' OR **'body mass'** OR 'bmi (body mass index)' OR 'body mass' OR 'body mass index' OR **'muscle mass'** OR 'muscle mass' OR 'muscle volume' OR 'muscle weight' OR 'weight, muscle' OR **'malnutrition'** OR 'deficient nutrition' OR 'malnourishment' OR 'malnutrition' OR 'underfeeding' OR 'undernourishment' OR 'undernutrition' OR **'dietary pattern'** OR 'dietary pattern' OR 'diet pattern' OR **'food intake'** OR 'food consumption' OR 'food ingestion' OR 'food intake' OR 'meal ingestion' OR 'feed intake' OR **'caloric intake'** OR 'caloric intake' OR 'calorie intake' OR 'calory intake' OR 'energy intake' OR 'intake, caloric' OR 'dietary energy' OR **'protein intake'** OR 'dietary protein' OR 'dietary proteins' OR 'food protein' OR 'intake, protein' OR 'protein consumption' OR 'protein intake' OR 'protein nutrition' OR 'protein feeding' OR 'diet protein' OR 'diet, protein' (EMBASE)