Risk factors associated with dehydration in older people living in nursing homes: Scoping review☆

Olga Masot[a,*], Ana Lavedán[a], Carmen Nuin[a], Miguel A. Escobar-Bravo[a], Jèssica Miranda[b], Teresa Botigué[a,*]

[a] Department of Nursing and Physiotherapy, University of Lleida, Lleida, Spain
[b] Residència i Centre de dia Lleida-Balàfia, GSS, Lleida, Spain

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ABSTRACT

Background: Dehydration in the older people is a prevalent problem that is often associated with physiological changes, physical limitations and environmental conditions.

Objectives: The scoping review was carried out to identify risk factors associated with dehydration in older people living in nursing homes.

Design: The revised scoping methodology framework of Arksey and O'Malley (2005) was applied. Study selection was carried out in accordance with Davis et al. (2009) and focused on the inclusion criteria (people over 65 years old and living in nursing homes). Risk factors were classified using the geriatric assessment.

Data sources: An electronic database search was performed in PubMed, Scopus and CINAHL. The literature search was carried out between October 2016 and January 2017.

Review methods: Thematic reporting was performed and study findings were validated through interdisciplinary meetings of experts. The quality of the papers consulted was also evaluated using the Newcastle-Ottawa Scale adapted for cross-sectional, cohort and case-control studies.

Results: In all, 16 papers were analysed, all of which were observational studies. The risk of bias ranged from very low (n = 1), to medium (n = 13) and high (n = 2). The risk factors were classified in line with the different components of the geriatric assessment. In the socio-demographic characteristics age and gender were identified. In the clinical component, infections, renal and cardiovascular diseases and end-of-life situations were the most common factors highlighted in the papers analysed. With reference to the functional component, its limitation was associated with dehydration, while for factors of mental origin, it was related to dementia and behavioural disorders. Finally, the factors relating to the social component were institutionalisation, requiring a skilled level of care and it being winter.

Conclusions: The most commonly repeated factors highlighted in the review were age, gender, infections, end of life and dementia, with it being important to highlight the large number of factors in the clinical component. Even so, the great majority of the factors were unmodifiable conditions associated typically associated with the physiology of ageing.

What is already known about the topic?

- Dehydration is a complex health problem involving a variety of clinical, physical, mental and social factors.
- Dehydration is a subject that has not been very widely researched amongst institutionalised older people.
- There is no gold standard for the correct diagnosis of dehydration in the elderly.

What this paper adds

- It identifies and clarifies the factors associated with dehydration in institutionalised older people living in nursing homes.
- It opens the way to carrying out more far-reaching research into the interaction between the factors considered and their relative importance in the incidence of dehydration.
- It reveals the factors that are associated with dehydration and allows

us to recognise the risk at an earlier stage and paves the way for designing screening tools in the future.

1. Introduction

Water is the largest single component of the human body, making up over 50% of total body mass (Armstrong-Esther et al., 1996). The Dehydration Council (Thomas et al., 2008) defines dehydration as "a complex condition resulting in a reduction in total body water. This could be primarily due to a water deficit (water loss dehydration or hypernatremia) or to both a salt and water deficit (salt loss dehydration or hyponatremia)". Dehydration is a common condition among older people (Bourdel-Marchasson et al., 2004) and hypernatremia is the most common type (Thomas et al., 2008).

Studies report high levels of dehydration in older people who live in nursing homes. Its prevalence probably ranges from 12% to 50% (An Vandervoort et al., 2013; Ellershaw et al., 1995; Hooper et al., 2016; Léger et al., 2002; Mentes, 2006; Wolff et al., 2015; Wu et al., 2011). To be more specific, in a study by the DRIE, carried out in the UK (DRIE—Dehydration Recognition in our Elders, 2016), the prevalence of dehydration was found to be 20%. However, another study carried out by Mentes (2006), in the USA, observed a level of around 30%.

The elderly have a high risk of dehydration for a number of socio-demographic and clinical reasons and also as a result of limitations imposed by their functional and cognitive state (Schols et al., 2009). These factors tend to be further exacerbated by chronic illnesses and the physiological changes caused by the ageing process (Godfrey et al., 2012).

The real incidence of dehydration is unknown and probably underestimated because the lack of standardised methods and the variety of ways for determining whether an individual is dehydrated or not (Vivanti et al., 2008). In nursing homes, many residents may be mildly dehydrated in the absence of acute illness, but this could go unnoticed until this dehydration becomes more severe (Bennett, 2000). Dehydration can be diagnosed by evaluating physical or cellular changes (Vivanti et al., 2010). Although using analytical parameters is optimal, it is invasive, time-consuming and expensive (Mentes and Wang, 2011). For these reasons, some authors consider diagnoses based on physical conditions to be more appropriate for older people (Vivanti et al., 2010).

Due to the high incidence of dehydration in nursing homes, its consequences and the lack of a gold standard for detecting it, it is considered essential for caregivers to know the risk factors associated with dehydration. For this reason, the aim of this scoping review is to identify and clarify the risk factors associated with dehydration in older people living in nursing homes.

2. Materials and methods

A scoping review is a technique for 'mapping' relevant literature in a field of interest (Arksey and O'Malley, 2005). Scoping involves making a synthesis and analysis of a wide range of research- and non-research-related material in order to provide greater conceptual clarity about a specific topic or field of evidence. Scoping reviews are also considered useful in policy-directed nursing research (Davis et al., 2009).

In the present case, the scoping review framework adopted was based on the methodological model of Arksey and O'Malley (2005) with contributions from Davis et al. (2009) and was divided into five stages.

2.1. Stage 1: identifying the research question

The research question addressed the way in which the search strategy was to be organised: "What are the risk factors associated with dehydration in older people living in nursing homes?"

2.2. Stage 2: identifying relevant studies

Relevant studies were identified by searching recent literature published between October 2016 and January 2017. The whole research team selected the key words, established the research strategies and defined the inclusion and exclusion criteria for the articles. OM and TB worked together to search in the PubMed; Scopus and CINAHL databases for the following terms: "dehydration" and "hydration"; "hypernatremia"; "osmolar concentration"; "thirst"; "drinking*"; "fluid intake"; "risk factor"; "aged"; "nursing home" and "long-term care".

No limits were put on either the language or the date of the research because few research projects have been carried out in this area. The criteria followed for the inclusion of papers were mainly observational studies (cross-sectional, cohort and case-control) that evaluated dehydration in institutionalised older people living in nursing homes. On the other hand, studies carried out at other care levels or that only focused on fluid intake (without considering dehydration) were excluded.

2.3. Stage 3: study selection

Focusing on the inclusion criteria, study selection was carried out in accordance with Davis et al. (2009), who stressed the need to include all relevant documentation relating to any sign, symptom or aspect of the problem being investigated. At the same time, they recommended excluding works that contain commentaries or conclusions that cannot be drawn from the results and/or tables presented as part of the study. In potential cases of controversy as to eligibility for inclusion, any final decision should be left to third party arbitration.

Thus, in step 1, the searches from each database were imported into the Mendeley version 1.17.8 (https://www.mendeley.com) and the full dataset was checked for duplication. The titles and abstracts were then screened for eligibility. Finally, in step 2, potentially relevant papers were screened based on their full text content. OM and TB each selected a number of studies independently. When there was any disconformity, a consensus was reached with the help of three other researchers (JM, CN and AL).

2.4. Stage 4: charting the data

The 16 papers finally included in the scoping were then subjected to data charting. The information was independently reviewed by two researchers (OM and TB). In cases of uncertainty, the final decision was taken in meetings and based on a consensus of three more researchers (JM, CN and AL). The data charting took into consideration information relating to: the author(s); year of publication; study location; study population(s); methodology; method of diagnosing dehydration; and dehydration risk factors.

Once the final articles had been selected, we proceeded to evaluate their quality using the Newcastle-Ottawa Scales (NOS) adapted for cross-sectional, cohort and case-control studies (Wells et al., 2007). This evaluation was carried out by the whole evaluation team.

2.5. Stage 5: collating, summarising and reporting the results

The risk factors identified in the papers reviewed were classified in line with the geriatric assessment (Stuck et al., 1993) used to evaluate the different clinical, functional, mental and social components of the health status of geriatric patients.

3. Results

3.1. Identification and selection of relevant papers

The total number of papers obtained from the initial database search was 763. After eliminating duplications (n = 492) and excluding 166 papers by quickly reviewing their titles and abstracts, the number of