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Thirst in adult patients in the intensive care unit: protocol for a scoping review

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**ABSTRACT**

Introduction Thirst is one of the most bothersome symptoms experienced by intensive care unit (ICU) patients. Effective diagnosis and management of thirst in the ICU is essential, particularly as patients are less sedated than previously and more aware of this problem. Currently, no overview of publications on thirst identification and management in ICU patients exists. The scoping review will address the broad question ‘What is known about thirst as a symptom in adult critically ill patients?’ It aims to provide an overview of the causes and risk factors, diagnosis and measurement, the symptom dimensions and its interaction with other symptoms, and thirst management.

Methods and analysis The review will follow the Joanna Briggs Institute methodology framework to guide the process and will be reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews. Methods include: defining the review questions, eligibility criteria, concepts of interest and context; and outlining the search strategy, study selection process, data extraction and analysis. PubMed, MEDLINE, EMBASE and CINAHL will be searched from inception to April 2022.

Ethics and dissemination Ethical approval is not required, as the scoping review will synthesise information from available publications. The scoping review will be submitted for publication to a scientific journal, presented at relevant conferences and disseminated as part of future workshops with ICU support groups and the critical care professional community.

**BACKGROUND**

Thirst is described as the ‘longing for fluids’, and is a conscious and subjective experience. Physiologically, the sensation of thirst can be induced from two pathways: (1) a lack of intracellular fluid with a concomitant rise in serum osmolality (osmotic thirst) or (2) a lack of extracellular fluid (hypovolaemic thirst). Both pathways send chemical and neural signals to the kidneys to retain fluid and to the brain to promote fluid intake. Thirst sensation may also arise from non-physiological factors such as habit, taste, dry mouth or thirst.

Thirst is one of the most intense symptoms reported by intensive care unit (ICU) patients. Studies report prevalence rates greater than 70%, while 33%–52% of the ICU patients rate the intensity of thirst as moderate and 18%–52% rate it as severe. Thirst frequently co-occurs with other symptoms, and is ranked as the most distressing symptom alongside pain, anxiety, dyspnoea, sleep deprivation and the use of restraints in ICU patients. Recent research reveals that the experience of co-occurring symptoms (symptom clusters) appears to worsen a patients’ functional status and quality of life. ICU survivors reported that thirst was their most frequently recalled experience of staying in the ICU.

Since 2002, practice changed from providing deep to lighter sedation and patients are more awake and alert. Lighter sedation offers greater possibility to discuss symptoms and symptom management with patients, but also leads to increased and more vivid memories of being in the ICU, including thirst experiences.

Factors found to be predictors of thirst in ICU patients are the use of certain medications, such as opioids and diuretics, receiving invasive mechanical ventilation, or not receiving oral fluids, and medical diagnoses like gastrointestinal disease. Many ICU patients are not permitted fluids due to swallowing dysfunction and risk of aspiration.
Interventions inducing xerostomia (dry mouth) are sometimes used in those patients to limit aspiration of saliva into the lungs.\textsuperscript{20} In addition, patients with an oral endotracheal tube have difficulties closing their mouth due to the tube itself, which also promotes xerostomia.

Some factors could impair adequately recognising and addressing thirst in ICU patients. First, reduced consciousness due to sedation and delirium are common in ICU patients. The majority of patients that are mechanically ventilated need some form of sedation, and the average prevalence rate for delirium is 30%.\textsuperscript{21, 22} Second, up to 65% of ICU patients suffer from ICU-acquired generalised muscle weakness.\textsuperscript{23} This leads to inherent problems with saliva into the lungs.\textsuperscript{20} In addition, patients with an oral endotracheal tube have difficulties closing their mouth due to the tube itself, which also promotes xerostomia.

Identifying the review questions
A preliminary exploratory review was conducted prior to developing the protocol to help refine the scope of the present protocol. This phase informed the main review question ‘What is known about thirst as a symptom in adult critically ill patients?’ and the following sub questions:

- What is known about causes and risk factors of thirst?
- What is known about diagnosis and measurement?
- What is known about the symptom dimensions of thirst?
  - Timing aspects: prevalence, time of day, onset.
  - Intensity.
  - Distress.
  - Qualitative aspects: experiences.
- What is known about the interaction of thirst with other symptoms?
- What is known about the management of thirst?

Defining the eligibility criteria, concepts of interest and context
We will include studies on adult patients (18 years and older) admitted to an ICU requiring critical care for more than 24 hours. This will include all types of intensive or critical care facilities such as general mixed ICUs, medical, surgical, cardiac surgical, neurological, burns and liver ICUs, and high dependency care units. We will exclude studies of adults admitted to facilities for less than 24 hours, such as those receiving short term post anaesthesia or surgical recovery care. We will also exclude studies of adults in long term clinical care facilities. Further, we will exclude studies that focus solely on ICU staff perceptions of thirst in their patients.

The concepts of interest include thirst, xerostomia and thirst with xerostomia combined. The Merriam-Webster Dictionary (https://www.merriam-webster.com/dictionary/) defines thirst as the sensation of needing or wanting to drink something and it can also be defined as a sensation of dryness in the mouth and throat associated with a desire for liquids. This dictionary also defines xerostomia as an abnormal dryness of the mouth due to insufficient secretions—also called dry mouth. Dry mouth can also be mistaken from thirst, and they frequently co-occur creating challenges in diagnosis, thus we include both concepts alone and combined.

In relation to these concepts, we will include studies that address all types of clinical interventions that describe and/or test strategies to diagnose, prevent and/or treat thirst and xerostomia. We will also include studies that report prevalence, causes and risk factors; measurement tools used in diagnosis and/or outcome measurement; studies reporting distress and other co-occurring symptoms associated with thirst and xerostomia.

The review will include all intensive and critical care contexts without limits to time periods, cultures, geographical locations, race or gender.
We have developed and piloted a data extraction tool (online supplemental appendix 2) and data will be extracted by two or more independent reviewers. We will revise the extraction tool, if necessary, during the data extraction process and provide details on these changes in the review. The data extracted will include specific details about the critical care facility and participants, concept, context, study types and methods and key findings relevant to the review questions. If appropriate, authors of papers will be contacted to request missing or additional data, where required.

Collating, summarising and reporting the findings
We will analyse quantitative data using appropriate descriptive and/or inferential statistics and will present results in tabular form. We will analyse qualitative data using content analysis and will summarise and present data in narrative form. All summaries will describe how the results relate to the review’s objective and questions.

ETHICS AND DISSEMINATION
Ethical approval for this review is not required because the scoping review will synthesise information from publicly available publications. With regard to dissemination activities, a paper reporting the findings of the scoping review will be submitted for publication to a scientific journal and presented at relevant critical care conferences. We anticipate that the findings will provide a comprehensive overview of thirst and associated symptoms along with the evidence base for assessing and managing thirst. We will highlight areas where evidence is controversial or missing. The review will provide essential information to critical care professionals and researchers interested in planning and delivering evidence-based practice and identifying gaps for further investigation of this distressing symptom. Therefore, findings will be also disseminated as part of future workshops with ICU support groups and educational programmes.

Table 1  Key terms

| Participants | Adult critically ill patients |
|--------------|-------------------------------|
| Concept      | Thirst, Xerostomia (subcategories: causes, risk factors, diagnosis, measurement, symptom dimensions, interaction, (nursing) management) |
| Context      | Intensive care units and other acute critical care facilities |

Identifying the search strategy
The search strategy will be conducted with support from an Information Specialist and will follow the three-step process recommended by the JBI. Using the key terms outlined in table 1, we will conduct a preliminary search in PubMed. From this search, we will derive more focused key terms and index terms to refine the search strategy. The final search will be adapted for the following electronic databases, PubMed, MEDLINE, EMBASE and CINAHL from inception and will be executed in April 2022. The proposed search strategy is displayed in online supplemental appendix 1.

We will consider all quantitative research studies such as published randomised and non-randomised controlled trials; observational studies, cohort and case studies; descriptive cross-sectional studies that report findings and studies that address design and testing of survey questionnaires. Further, we will consider all qualitative research studies such as phenomenology, grounded theory, ethnographic and quality improvement. All non-research studies will be excluded. We will search relevant systematic reviews and reference lists of relevant studies to capture additional studies not captured in the search. We will not limit the search by time, but will limit the search to language including only those published in English, Norwegian, Swedish, Danish and Dutch.

Study selection and data extraction process
Citations will be searched from inception and uploaded into EndNote (V.X20, 2020, Clarivate Analytics, Pennsylvania, USA) and duplicates will be removed. Titles and abstracts will be screened by two or more independent reviewers for assessment against the inclusion criteria. Citations will be classified as included, excluded or uncertain. Results will be discussed between reviewers and conflicts and uncertainties will be resolved. Full-text papers from potentially relevant sources will be retrieved and assessed in detail against the inclusion criteria by two or more independent reviewers. Disagreements or uncertainties will be resolved through discussion, or with an additional reviewer/s. We will record reasons for full text exclusion in a table of excluded studies. The results of the search and the study inclusion process will be reported in full in the final scoping review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews flow diagram.
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