

# Nursing knowledge on skin ulcer healing: a living scoping review protocol

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## ABSTRACT

**Objective:** This review aims to continuously map the nursing knowledge on skin ulcer healing in any context of care.

**Introduction:** Chronic wounds are an increasing concern for society and health care providers. Pressure ulcers and venous ulcers, among others, have devastating effects on morbidity and quality of life and require a systematic approach. The nursing process is an important method that allows a better organization and overall care quality for a systematic and continuous professional approach to nursing management of skin ulcers. The integration of this nursing knowledge in informatics systems creates an opportunity to embed decision-support models in clinical activity, promoting evidence-based practice.

**Inclusion criteria:** This scoping review will consider articles on nursing data, diagnosis, interventions, and outcomes focused on people with skin ulcers in all contexts of care. This review will include quantitative, qualitative, and mixed methods study designs as well as systematic reviews and dissertations.

**Methods:** JBI's scoping review guidance, as well as the Cochrane Collaboration's guidance on living reviews, will be followed to meet the review's objective. Screening of new literature will be performed regularly, with the review updated according to new findings. The search strategy will map published and unpublished studies. The databases to be searched include MEDLINE, CINAHL, Scopus, *JBI Evidence Synthesis*, Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials, and PEDro. Searches for unpublished studies will include OpenGrey and Repositórios Científicos de Acesso Aberto de Portugal. Studies published in English and Portuguese since 2010 will be considered for inclusion.

**Scoping Review Protocol Registration:** Open Science Framework: <https://osf.io/f6s4e/>

**Keywords:** electronic health records; nursing; review literature as topic; skin ulcer; wound healing

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## Introduction

Nearly 2 million people across Europe are estimated to be living with chronic wounds.<sup>1</sup> These wounds persist for an average of 109 weeks

and affect mostly older people.<sup>2</sup> Chronic wounds fail to advance through sequential and timely restoration and do not reinstate normal anatomy and function.<sup>3</sup> The differential diagnosis is extensive since they originate from numerous local and systemic elements. Venous ulcers, arterial ulcers, and diabetic foot ulcers are the most common ulcers in the lower extremities.<sup>3</sup> Pressure ulcers are a common concern on hospitalized persons, affecting over 5% and occurring over bony prominences.<sup>3</sup>

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Wound care specialists, such as post-graduated nurses, are increasingly needed to meet the escalating requirement for chronic wound prevention and treatment. Nurses care for persons with different diagnoses of wounds that can have harmful health care outcomes, with increased morbidity and mortality due to complications such as pain, heavy exudate, foul odor, extensive necrosis, infection, sepsis, and limb amputation.<sup>4</sup>

A systematic and methodical approach is well supported to provide good-quality wound care from the stage of diagnosis to ulcer healing for all differentials of chronic wounds.<sup>5</sup> The nursing process is a method that allows a better overall organization and care quality for a systematic and continuous professional approach.<sup>6</sup> Several recommendations concerning chronic wound documentation have been published, including the necessity for standards and specifications for secondary data operation.<sup>7</sup>

The nursing process is an evolving method for nursing practice, and its application requires more enlightenment on the contents included. Several stages have been described, including the initial evaluation, diagnosis, planning, implementation, and final evaluation.<sup>8</sup> Other up-to-date terms such as “data,” “interventions,” or “outcomes” are now more commonly used.<sup>9</sup>

An early and precise nursing diagnosis is essential in establishing the appropriate actions for managing chronic wounds.<sup>5</sup> A nursing diagnosis is a significant concept for the nurse and person being cared for; it describes new findings after evaluating a clinical area, a significant event, or another health issue.<sup>10</sup> Identifying the factors contributing to the ulcer can be challenging, even with a careful and systematic assessment, due to multiple subjacent components, ambiguous diagnostic, and multiple etiologies.<sup>5</sup>

Initial assessment must comprise a detailed evaluation of the ulcer characteristics, including the appearance, peri-ulcer area, edges, temperature, pulses, exudate volume, ulcer location, and sensation.<sup>5</sup> Evaluating these characteristics serves multiple purposes, such as measuring healing rates and other outcomes,<sup>11</sup> supporting clinical decisions, and promoting better judgments.<sup>12</sup> Several electronic applications have been developed to enhance further data collection, such as wound measurement, healing assessment, or decision-making in dressing selection for evidence-supported interventions.<sup>13</sup>

Nursing interventions can be described as actions performed to improve or maintain the health of a person, group, or population.<sup>10</sup> A specific strategy needs to be established to handle the chronic ulcer etiology, such as offloading for a diabetic foot or compressing for a venous ulcer, depending on the person’s partnership in the care plan.<sup>5</sup>

The objectives for choosing a suitable proposal must be aligned with the person’s expectations and the institution’s capabilities. Goals range from a decreased healing time, a cost-effective approach, and the person’s quality-of-life improvement. Wound healing research is performed in several scientific areas, including nursing, materials science, and molecular biology.<sup>14</sup> With thousands of wound dressings and therapies available, the intervention-selection stage can be challenging for clinicians.<sup>5</sup> Choosing an adequate intervention and wound dressing should be grounded on the evaluated characteristics and then compared against the product specification: shallow wounds, wounds with necrose or slough, highly exudative wounds, tunneling wounds, and colonized wounds, for example.<sup>15</sup>

In order to achieve a better nursing knowledge formalization, the Centre for Information Systems Research and Development of Porto Nursing School, which is an International Council of Nurses–accredited center for International Classification for Nursing Practice (ICNP) research and development, implemented a project designed to build a nursing ontology.<sup>16</sup> This ontology is defined as a description of a domain’s concepts and relationships, which will allow better decision-making, with direct application in nursing practice.

This ontology is built upon several related logical models designed to express clinical nursing concepts and their relations consistently, specifying the most up-to-date available scientific knowledge as logical data components.<sup>9</sup> These structures are known as clinical information models (CIMs) and embed the informatic systems with discipline knowledge. In order to build a CIM, we will follow the recommendations from the International Organization for Standardization ISO/TC 13972:2015<sup>9</sup> by researching the available scientific literature and involving domain and modeling experts.

The academy is already developing multiple nursing CIMs.<sup>17-19</sup> To achieve this goal in the skin ulcer healing domain, we need to develop research that is able to map the available knowledge in the literature;

translate mapped data into concepts sustained by a theoretical framework and taxonomy; and identify relationships between the multiple concepts that emerge.

When these CIMs integrate the informatic systems, they will enhance the nurse's decision-making process<sup>20</sup> and how they apply clinical reasoning skills, particularly on the data used to evaluate a nursing problem, how this problem is labeled, and what nursing interventions are implemented, leading to an expert and competent practice.<sup>21</sup>

A preliminary search of PROSPERO, MEDLINE, the Cochrane Database of Systematic Reviews, and *JBIEvidence Synthesis* was conducted, and no current or in-progress scoping reviews on the topic were identified.

This scoping review aims to continuously map nursing knowledge on skin ulcer healing according to each nursing process component, specifically, diagnoses, assessment data, interventions, outcomes, and relationships. Data collected in this scoping review will help embed an existing nursing ontology with formal knowledge, allowing for continuous updates and integration of new nursing knowledge on the informatics systems.

### Review questions

- Which diagnoses do nurses identify when addressing skin ulcers (eg, venous ulcer)?
- What data do nurses evaluate to identify those diagnoses (eg, ankle-brachial index)?
- What data do nurses evaluate to characterize the identified diagnoses (eg, exudate amount)?
- Which interventions do nurses implement that target skin ulcer healing (eg, apply compression therapy)?
- Which outcomes do nurses measure to evaluate intervention effectiveness (eg, time until ulcer healing)?
- Which relationships exist between identified nursing data, diagnoses, interventions, and outcomes (eg, if slough tissue is present on a pressure ulcer, debride the wound)?

### Inclusion criteria

#### *Participants*

The review will consider studies that include people of all ages with skin ulcers. Other integumentary issues, such as surgical wounds, will not be included.

If a study includes several types of wounds, they will be included in an attempt to specify results for the skin ulcers alone.

#### *Concept*

The concept of interest is the formal nursing knowledge used to develop the nursing decision-making process directed at ulcer healing, specifically the nursing diagnosis, evaluation data, interventions, outcomes, and relationships in-between.

#### *Context*

This review will consider studies from all types of settings and contexts where nursing care is delivered. Studies will be included regardless of country of origin or sociocultural setting.

#### *Types of sources*

This scoping review will consider all types of quantitative, qualitative, and mixed methods study designs. Conference abstracts, posters, comments, and letters to the editor will be excluded due to their brevity.

Studies published in English and Portuguese will be included. Studies published since 2010 will be considered for inclusion. To be helpful, reviews must be valid and consistent, which implies that the studies' methods are reliable. Thus, reviews must reflect all relevant research results, including the most recently published data.<sup>22</sup> While there is wound dressing documentation dating back to Ancient Greece, this review aims to map the most up-to-date knowledge of ulcer care. As most recent studies are more likely to portray the world's current reality, we consider these previous 10 years comprehensive of the specific diagnosis, data, intervention, or outcome. If one of these nursing process elements has not been mentioned in the previous 10 years, it is no longer useful for clinical practice.

### Methods

The proposed review will be conducted following JBI methodology for scoping reviews and the Cochrane Collaboration's guidance for living systematic reviews.<sup>22-24</sup> The scoping review method will allow us to answer the research questions with an evidence synthesis approach, providing an overview of this subject's available knowledge and identifying key concepts and gaps in the research.

The choice to conduct a living review relates to the need to achieve dynamic integration of formal nursing knowledge into practice through decision-support systems. When new knowledge is published on ulcer care, this review will evaluate the need to include those articles and perform the update, providing nurses with a synthesized and comprehensive nursing process encompassing all the possibilities available. Future systematic effectiveness reviews based on these findings will allow nurses to support their decision-making using new evidence-based practice resulting from this evidence synthesis, enhancing nursing care and the quality of life of the people being cared for.

Regular observation of literature regarding the subject in question will be performed to guide updates to the review. The team included will discuss the need to integrate the new knowledge in this review and subsequently in the CIM.

The protocol for this living scoping review was registered in Open Science Framework (<https://osf.io/f6s4e/>).

### Search strategy

The search strategy will aim to locate both published and unpublished studies. An initial limited search of MEDLINE (PubMed) and CINAHL (EBSCO) was undertaken to identify articles on the topic. The text words contained in the titles and abstracts of relevant articles and the index terms used to describe the articles were used to develop a full search strategy for MEDLINE (PubMed; see Appendix I). The search strategy, including all identified keywords and index terms, will be adapted for each included information source. The reference lists of all studies selected will be screened for additional studies.

A bibliometric and information specialist will develop the complete search strategy using the PRESS 2015 guideline assessment form<sup>25</sup> and send it to a second specialist for peer-reviewing who will then review the strategy using the evidence-based checklist.<sup>25</sup>

As mentioned by Tricco *et al.*,<sup>26</sup> following the Cochrane guidance on living reviews, electronic database searches will be performed 12 months after the original search date to guide the review update.<sup>22</sup> Afterwards, we will undergo monthly literature searches, with new updates when a minimum of 10% new literature is achieved compared to the current search results.

The databases to be searched include MEDLINE (PubMed), CINAHL (EBSCO), Scopus (Elsevier), *JBI Evidence Synthesis*, Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials, and PEDro. Search for unpublished studies will include OpenGrey and Repositórios Científicos de Acesso Aberto de Portugal (RCAAP).

### Study selection

Following the search, all identified citations will be collated and uploaded into EndNote v20.1 (Clarivate Analytics, PA, USA) and duplicates removed. The entire review team will perform pilot testing prior to both title and abstract, and full-text screening.

For the first stage, 5% of the total search will be used to achieve approximately 75% agreement between reviewers. In the second stage, 2% of the full-text articles will be used to achieve the same amount of agreement. Two independent reviewers will then screen titles and abstracts for assessment against the inclusion criteria for the review. Studies that could potentially meet the inclusion criteria will be retrieved in full. If the reviewers have uncertainties about a study's relevance or the abstract is unclear, the entire article will be retrieved. The full text of selected studies will be retrieved and assessed in detail against the inclusion criteria. Full-text studies that do not meet the inclusion criteria will be excluded, and the reasons for exclusion will be provided in an appendix in the scoping review's final report.

If a study meets all other inclusion criteria during the title and abstract screening but not the language requirement (ie, it is not published in English or Portuguese), it will be noted in the appendix. Disagreements between reviewers at each stage of the study selection process will be resolved through discussion or with a third reviewer. The search results will be reported in full in the final report and presented in a Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR) flow diagram.<sup>27</sup>

### Data extraction

Data will be extracted from papers included in the scoping review by two independent reviewers using a data extraction tool aligned with this review's objective and question (Appendix II). A two-stage data extraction strategy will be used to allow maximum data reduction without compromising the findings.

The draft data extraction tool will be modified as required throughout the review, depending on the data extracted from the included studies.<sup>23</sup> These modifications will be documented in the full scoping review report. Two reviewers will extract data independently. Any disagreements that arise between the reviewers will be resolved through discussion or with a third reviewer.

Two independent reviewers will chart the “first five to ten included studies using the data-charting form and meet to determine whether their approach to data extraction is consistent with the research question and purpose,” as suggested by Levac, *et al.*<sup>28(p.4)</sup> Authors will be contacted for further information/clarification of the data where required, as suggested by JBI and the Cochrane Collaboration’s guidance.<sup>22-24</sup>

### First stage

Full text of the selected articles will be uploaded to NVivo v1.5 (QSR International, United Kingdom). A classification sheet will be included for each article with specific details about the population, concept(s), context, study methods, and key findings relevant to the review objective. Nodes will be created to represent the concept components (data, diagnosis, interventions, outcomes) before the articles’ extraction. Data related to each component will be inserted raw, as context units, in the respective node.

This scoping review will include only qualitative data regarding the nursing process elements focused on skin ulcer care. Only the semantic part of the articles will be extracted (eg, intervention names), since we aim to perform only the qualitative mapping, providing clear information on which relations to test on future comprehensive reviews.

### Second stage

A content analysis of the extracted context units will be performed to categorize the raw data. Rules of encoding will be based on the ICNP concept definitions as of 2019,<sup>29</sup> and the category structure recommended by the ISO 18104:2014.<sup>10</sup> Nodes representing each category will be created through NVivo.

### Data analysis and presentation

The information mapped in the data extraction instrument (Appendix II) will be subjected to the

content analysis method. The new results will then be presented in independent tables for each research question in this scoping review (Appendix III). Finally, a narrative summary will connect the results in these tables to the objectives of this review.

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## Appendix I: Search strategy

### MEDLINE (PubMed)

Search conducted in May 03, 2021

Search	Query	Records retrieved
#1	((pressure ulcer*[Title/Abstract] OR leg ulcer*[Title/Abstract] OR foot ulcer*[Title/Abstract] OR varicose ulcer*[Title/Abstract] OR venous ulcer*[Title/Abstract] OR arterial ulcer*[Title/Abstract] OR ischemic ulcer*[Title/Abstract] OR diabetic ulcer*[Title/Abstract])) OR ("Pressure Ulcer"[MeSH Terms] OR "Ulcer"[MeSH Terms] OR "Foot Ulcer"[MeSH Terms] OR "Diabetic Foot"[MeSH Terms] OR "Varicose Ulcer"[MeSH Terms] OR "Leg Ulcer"[MeSH Terms] OR "Skin Ulcer"[MeSH Terms:noexp] OR "Buruli Ulcer"[MeSH Terms]))	64,723
#2	((nurs*[Title/Abstract])) OR ("Nursing"[MeSH Terms:noexp] OR "Nursing"[MeSH Subheading]))	580,764
#3	#1 AND #2	7855
#4	Filter: Since 2010	2949
#5	Filter: Languages – Portuguese; English	2683

**Appendix II: Data extraction instrument**

Author(s)	
Year of publication	
Sample size	
Context	
Nursing diagnoses	
Assessment data	
Evaluation data	
Nursing interventions	
Nursing outcomes	
Relationships	



### Appendix III: Data presentation instruments

Table 1: Diagnoses identified by nurses in people with skin ulcers

Diagnosis category	Context units

Table 2: Data assessed by nurses to identify diagnoses

Assessment data category	Context units

Table 3: Data evaluated by nurses to characterize the identified diagnoses

Evaluation data category	Context units

Table 4: Interventions nurses implement that target the skin ulcer healing

Intervention category	Context units

Table 5: Outcomes nurses measure regarding skin ulcer healing

Outcome category	Context units

Table 6: Relationship between identified diagnosis, data, interventions, and outcomes

From category	To category	Relation type	Context units