

LITERATURE SEARCH STRATEGIES: A GUIDELINE FOR IDENTIFYING THE BEST EVIDENCE IN HEALTHCARE

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ABSTRACT

Objective: to present a guideline for the development of search strategies aimed at identifying the best evidence in the health field.

Method: theoretical reflection based on a critical review of the literature and the authors' experience, identifying consensus on existing methodologies and best practices in the development of search strategies.

Results: The guideline includes eight essential stages, from preliminary reading and definition of the problem to documentation of the search. It provides instructions for identifying keywords, using terms in thesauruses, combining Boolean operators and adapting to different databases. It also includes pilot tests for adjustments and promotes transparency, optimizing the identification of the best health evidence as well as improving the quality of literature reviews.

Conclusions: The proposal presents a practical framework for developing search strategies, providing a clear guide for optimizing research and synthesis of health evidence, with the emphasis on practical applicability.

KEYWORDS: Research. Evidence-Based Practice. Review Literature as Topic. Information Science. Information Storage and Retrieval. Health. Nursing.

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ESTRATÉGIAS DE BUSCA NA LITERATURA: ROTEIRO PARA IDENTIFICAÇÃO DAS MELHORES EVIDÊNCIAS NA ÁREA DA SAÚDE

RESUMO

Objetivo: apresentar um roteiro de orientação para a elaboração de estratégias de busca visando identificar as melhores evidências na área da saúde.

Método: reflexão teórica baseada em uma revisão crítica da literatura e na experiência dos autores, destacando consensos sobre metodologias existentes e melhores práticas no desenvolvimento de estratégia de busca.

Resultados: O roteiro abrange oito etapas essenciais, desde a leitura preliminar e definição do problema até a documentação da busca. Ele orienta a identificação de palavras-chave, o uso de termos em tesauros, a combinação de operadores booleanos e a adaptação para diferentes bases de dados. Inclui testes piloto para ajustes e promove a transparência, otimizando a identificação das melhores evidências em saúde e aprimorando a qualidade das revisões de literatura.

Conclusões: A proposta apresenta uma estrutura prática para o desenvolvimento de estratégias de busca, fornecendo um roteiro claro para otimizar futuras sínteses de evidências em saúde, com ênfase na aplicabilidade prática.

DESCRITORES: Pesquisa. Prática clínica baseada em evidências. Literatura de revisão como assunto. Ciência da informação. Armazenamento e recuperação da informação. Saúde. Enfermagem.

ESTRATEGIAS DE BÚSQUEDA EN LA LITERATURA: GUÍA PARA LA IDENTIFICACIÓN DE LAS MEJORES EVIDENCIAS EN EL ÁREA DE LA SALUD

RESUMEN

Objetivo: presentar una guía de orientación para la elaboración de estrategias de búsqueda con el fin de identificar las mejores evidencias en el área de la salud.

Método: reflexión teórica basada en una revisión crítica de la literatura y en la experiencia de los autores, destacando consensos sobre metodologías existentes y mejores prácticas en el desarrollo de estrategias de búsqueda.

Resultados: La guía abarca ocho etapas esenciales, desde la lectura preliminar y la definición del problema hasta la documentación de la búsqueda. Orienta la identificación de palabras clave, el uso de términos en tesauros, la combinación de operadores booleanos y la adaptación a diferentes bases de datos. También incluye pruebas piloto para ajustes y fomenta la transparencia, optimizando la identificación de las mejores evidencias en salud y mejorando la calidad de las revisiones de literatura.

Conclusiones: La propuesta presenta una estructura práctica para el desarrollo de estrategias de búsqueda, proporcionando una guía clara para optimizar futuras síntesis de evidencias en salud, con énfasis en su aplicabilidad práctica.

DESCRITORES: Investigación. Práctica clínica basada en la evidencia. Literatura de revisión como asunto. Ciencia de la Información. Almacenamiento y recuperación de la Información. Salud. Enfermería.

INTRODUCTION

The concept of evidence, which includes a diversity of data, reports and observations to support conclusions on a specific topic, emphasizes the intrinsic connection between this evidence and its context. This requires careful assessment of its applicability in different situations¹. Global evidence provides an essential starting point for evaluating interventions, but context-specific results may not be widely generalizable. On the other hand, local evidence from specific settings are crucial for analyzing problems, approaches and implementation strategies adapted to particular realities².

In the healthcare field, especially in nursing science, research into knowledge synthesis, such as systematic reviews and meta-analyses, is fundamental for consolidating the best available evidence to support evidence-based practice³. However, the quality and consistency of search strategies in these reviews continue to be a challenge, which can directly impact the effectiveness of interventions in several areas of nursing, such as the use of clinical decision support systems and the integration of technologies into care practices, highlighting the need for methodological rigor in search processes⁴.

The number of studies dedicated to knowledge synthesis in the healthcare field has increased significantly, particularly systematic reviews³. However, concerns have arisen regarding the quality of these studies⁵. In a survey aimed at evaluating searches conducted in systematic reviews in Medline/PubMed, it was found that 78.1% of the strategies had flaws, which directly impacted information retrieval and, consequently, the conclusions⁶. This finding is particularly relevant for nursing, as the quality of evidence directly influences clinical practice and care decisions³.

The process of searching the literature is central to the success of evidence synthesis, and therefore the quality of the search significantly impacts the final product⁷. In this sense, improving search strategies is a critical necessity, especially considering the diversity of sources and the complexity of information systems in the healthcare field.^{8,9}

In recent years, guidelines such as the Peer Review Guide and Checklist for Electronic Search Strategies (PRESS) have been developed to ensure quality of searches performed^{7,10}. Although PRESS is widely used in systematic reviews, there is a gap in the adaptation of these guidelines to nursing practice, which has its own specificities, such as the emphasis on the humanization of care and the particularities of patients³. This reflection aims to contribute to the improvement of search strategies, with special attention to their applicability in the nursing context, offering support to improve evidence-based clinical practice. This reflection seeks to present a guiding framework for the development of search strategies aimed at identifying the best evidence in the field of health.

METHOD

This article adopts a theoretical reflection format, based on a critical review of the existing literature^{4,11-13} and the authors' experience in the field of synthesizing health knowledge. We did not use an empirical approach with primary data collection. Instead, reflection was grounded in established consensus¹³, relevant guidelines^{10-12,14} and the analysis of search strategies described in the literature^{4,14,15}. The selection of materials was guided by the relevance of the topics discussed and their applicability to evidence-based practice in nursing.

RESULTS

Search strategy: definition and challenges

The search strategy can be defined as a technique or set of rules designed to facilitate the connection between a formulated question and the information stored in a database, enabling more efficient information retrieval^{11,12}. In this way, the search is conducted using a 'strategy', which consists

of a set of words and/or terms that, when combined, generate results of citations relevant to the topic being searched⁸.

Systematized research involves applying the same search strategy or sequence of strategies as closely as possible to ensure the same approach across several databases. This consistency in approach will minimize the possibility of missing important steps within the strategy and ensure that the same search is performed in each database¹⁶. In this context, a carefully developed strategy enables a precise and focused approach to a specific topic within a given subject.

Particularly noteworthy is that the construction of the search strategy should be supported by a librarian with expertise in search strategy development and the search process itself^{8,16–18}. However, the researcher must have an active role in this process, using his or her experience to guide strategy formulation.

Evaluating the quality of reporting in systematic reviews reveals challenges related to language restrictions, which require the inclusion of researchers proficient in several languages in order to improve the selection of studies. Additionally, obtaining translations of documents for analysis can significantly increase the cost and logistical complexity of the project^{3,4}.

It is important to realize that limitations on the resources available for searching may require pragmatic decisions about what types of information are required. Search methods differ in their effectiveness depending on the type of information desired. For example, a search in scientific databases is usually more efficient for finding peer-reviewed articles, while a search in grey literature, such as technical reports and dissertations, can take longer and require more resources due to their lower level of standardization and more difficult access^{19,20}.

Thus, developing the search strategy requires a greater level of specificity in the research question, involving an increase in the number of thematic groups, which contributes to the complexity of the strategy's development. The researcher must formulate a sufficiently clear question, but at the same time provide enough information to create a consistent strategy. The probability of retrieving information decreases as the number of descriptors between the Boolean operator AND increases²¹.

In addition, it is essential to recognize that there are frequent errors in the strategy, including typing mistakes, inappropriate use of Boolean operators, and omission of relevant synonyms³. Therefore, careful attention to the formulation of the research question and the selection of descriptors, synonyms, and keywords is essential to avoid such errors and improve the search strategy effectiveness.

Based on these considerations, we offer a structured proposal grounded in consensus between existing methodologies and best practices for the development of a search strategy, using an eight-step process.

Stages for developing the search strategy

Step 1: Previous reading on the theme

In order to begin the search strategy design, researchers must first have sufficiently read about the subject, carefully checking the keywords and terms used in these studies to define the research question.

Thus, the preliminary review of the literature related to the subject in question aims to identify 'mother articles', *i.e.* fundamental and relevant studies that will provide a basis for the development of the new study. In-depth reading of these key articles provides valuable information on previous approaches, identification of new search terms, and the logical formulation of the strategy, providing a solid basis for construction of new knowledge^{3,4}.

Step 2: Defining the problem

The precise definition of the research problem is a fundamental step in the process of preparing systematized review methods, guided by the objectives of the review and by the research question to be answered⁴. For the literature review method, this definition must be clear and objective, involving key terms related to the topic under study²¹. The formulation of the research question is essential; it guides the investigation and relevant key terms^{9,21}.

Preliminary analysis of the literature contributes to identifying gaps in knowledge and areas of uncertainty⁹. The research question must be appropriately formulated for the proposed review method, broad enough to cover all relevant studies, with adequate specificity to guide the search strategy⁹. A common approach to organizing these questions is the PICO model (P: Patient, Problem or Population; I: Intervention; C: Comparison; O: Outcome), which provides a logical structure to outline the essential elements of the research question and facilitate the construction of an effective search strategy.^{14,21,22}

Adapting the PICO model to the specific details of each study is crucial to guaranteeing the relevance and comprehensiveness of the search strategy. Variations such as PECO (Population, Exposure, Comparator, Outcome), PIO (Population, Intervention, Outcome), PCC (Population, Concept, Context), SPICE (Setting, Perspective, Intervention, Comparison, Evaluation), SPIDER (Sample, Phenomenon of Interest, Design, Evaluation, Research type), among others, can be used to better adapt to the particular nature of certain research questions^{14,22}. These conceptual models not only provide an organized structure, promoting clarity and consistency regarding the development of the research question, but also contribute to the overall quality of the study. Thus, a well-designed definition of the research problem is essential for an efficient search strategy and identification of relevant studies²³.

Step 3: Identifying terms and keywords

The search strategy begins by identifying relevant terms and keywords, based on the objective of the study and the elements of the chosen acronym⁸. Recommendations suggest that when using the PICO model, the strategy should begin with the Population (P) and Intervention (I) components^{4,12}. It is important to note that the terms related to Comparison and/or Results are generally not incorporated initially, as they can be neglected in titles and abstracts, and are not often included as controlled terms²⁴.

The decision on whether to include the terms for Outcomes (O) should be carefully analyzed by researchers during the development of the search strategy, considering that a very restrictive approach can limit the retrieval of relevant studies¹². A broader search strategy with a subsequent selection of relevant studies may be a better alternative. Therefore, testing each component of the search strategy is an important approach to support decision-making regarding the terms used in the search.

Ensuring a proper balance between comprehensiveness (sensitivity of the search) and relevance (precision of the search) is essential to achieve an effective search. A sensitive search should capture all articles related to the topic, while specificity is necessary to avoid irrelevant results. This balancing between sensitivity and precision is essential in order to find as many relevant studies as possible without overwhelming the researcher with unnecessary information^{3,8,18}.

Once the main terms have been identified, the next step is to cluster them, whenever possible, into categories of similarity. This organization enables easier visualization and development of the search strategy⁸.

Step 4: Search for term in thesauruses in the databases

The next step in the process of constructing the search strategy involves consulting the thesauruses (controlled vocabulary that helps to standardize and expand the search for related terms and synonyms, ensuring a more comprehensive and accurate representation of relevant literature) of the main databases, such as Descriptors in Health Sciences of the Virtual Health Library (DeCS), indicated for searches in Latin American and Caribbean databases, Medical Subject Headings (MeSH) for Medline/Pubmed, Subject Headings of the Cumulative Index to Nursing and Allied Health Literature (CINAHL of EBSCO), Emtree in Embase, among others. The aim is to identify controlled terms and relevant synonyms. A balanced combination of controlled and alternative terms along with keywords is essential, as each type of term plays a specific role in the search^{4,22}. The idea is to develop a unique strategy, adapted to the particularities of each database selected, considering the specific features and functionalities of each platform. This includes the use of thesauruses such as MeSH in PubMed or Emtree in Embase, the appropriate application of Boolean operators, as well as truncation and filters to optimize the search according to the resources available in each database.

The health terms that constitute the descriptors are part of a controlled vocabulary, which is essential for delimiting the topics in each database. When a term does not have an official descriptor in a database, it is advisable to use free terms, along with their synonyms^{3,4}. The inclusion of keywords is particularly valuable in emerging areas or when terms are not present in database thesauruses. When identifying subject definers, variations in the indexing terms of each database are essential, such as MeSH in Medline/PubMed and Emtree in Embase. In addition, the incorporation of keywords is absolutely essential, as not all concepts will have an indexer¹². Figure 1 shows examples of the controlled terms and their synonyms in DeCS/MeSH and MeSH.

The search strategy is finalized by using the same search terms and keywords in all databases, ensuring that the search is comprehensive. Although it is essential to maintain consistency, small variations may be necessary due to the peculiarities of each database, and it is important that the researcher justifies these variations¹⁶. A practical example is the search strategy outlined in the national databases, where the researcher must include terms in at least three languages spoken in Latin America: Portuguese, English and Spanish²⁵. The search for combined words and terms must be comprehensive, including all synonyms, plurals, and alternative spellings to avoid losing evidence. Competent researchers have the ability to improve the effectiveness of the search by expanding the strategy with spelling variations and synonyms. The intention is to ensure that no study relevant to the research question is missed during identification.

The beginning of the search for terms in DeCS/MeSH proves to be a valuable practice for new researchers in knowledge synthesis methods, as it enables the identification of terms in English that will guide the subsequent consultation using MeSH in Medline/PubMed. A notepad, the reviewer's best tool, plays a vital role in the review process, as it facilitates copying and pasting information without including marks from the internet. This resource is essential for maintaining the integrity and clarity of the data collected, ensuring that the evidence is compiled accurately and free from external interference.

Step 5: Combine terms and keywords with Boolean operators

The development of an efficient search strategy requires understanding and proper use of Boolean connectors, also known as Boolean operators. The next step in this process is to identify which Boolean operators will be used and correctly apply them to the terms identified in the previous readings and searches in the thesauruses of the chosen databases.

Thesaurus	Demonstration										
DeCS/ MeSH	Details Tree Structures Concepts <table> <tr> <td>Descriptor English:</td><td>Subject Headings</td></tr> <tr> <td>Descriptor Spanish:</td><td>Descriptores</td></tr> <tr> <td>Descriptor Portuguese:</td><td>Descritores</td></tr> <tr> <td>Descriptor French:</td><td>Vedettes-matière</td></tr> </table> <i>DESCRIPTORS IN 3 LANGUAGES</i> <table> <tr> <td>Entry term(s):</td><td> Descriptor Descriptors Heading, Subject Headings, Subject Keyword Keywords Subject Heading </td></tr> </table> <i>SYNONYMS</i> Tree number(s): L01.462.750.245.945.700 RDF Unique Identifier: https://id.nlm.nih.gov/mesh/D013358 DEFINITION Scope note: Terms or expressions which provide the major means of access by subject to the bibliographic unit.	Descriptor English:	Subject Headings	Descriptor Spanish:	Descriptores	Descriptor Portuguese:	Descritores	Descriptor French:	Vedettes-matière	Entry term(s):	Descriptor Descriptors Heading, Subject Headings, Subject Keyword Keywords Subject Heading
Descriptor English:	Subject Headings										
Descriptor Spanish:	Descriptores										
Descriptor Portuguese:	Descritores										
Descriptor French:	Vedettes-matière										
Entry term(s):	Descriptor Descriptors Heading, Subject Headings, Subject Keyword Keywords Subject Heading										
MeSH	Subject Headings ← <i>DESCRIPTOR</i> Terms or expressions which provide the major means of access by subject to the bibliographic unit. <i>DEFINITION</i> PubMed search builder options ☐ Restrict to MeSH Major Topic. ☐ Do not include MeSH terms found below this term in the MeSH hierarchy. Tree Number(s): L01.462.750.245.945.700 MeSH Unique ID: D013358 Entry Terms: • Heading, Subject • Headings, Subject • Subject Heading ✓ • Descriptors ✓ • Descriptor ✓ <i>SYNONYMS</i> → <i>NOTE: IN THIS CASE, TERMS WITH COMMAS SHOULD BE OMITTED</i>										

Figure 1 – Example of a controlled term and its synonyms in DeCS/MeSH and MeSH.
Source: the authors

Boolean operators, which originate from Boolean algebra, are fundamental tools for combining terms in any database to limit or expand search results⁸. The “AND” connector is appropriate when it is necessary to associate different concepts, such as the components of the PICOT question, and its use restricts the search to studies that contain both terms combined. The Boolean connector “OR” is generally used to expand the search by including the search terms in the list of results, as they are synonyms^{3,16}.

The use of “AND” searches for an associated term, while “OR” searches for one term or another and is generally used between synonymous or approximate terms (Figure 2). On the other hand, the Boolean exclusion operator “NOT” is used to remove the association of one term with another, or the exclusion of a term. However, “NOT” should not be used in knowledge synthesis methods, as it can result in the exclusion of relevant studies⁸.

When combining groups of similar terms connected by the “OR” operator, it is essential to include each group in brackets to ensure that all the terms contained within them are crossed with all the terms in the other group when they are combined by “AND”⁸.

Each searching system has its own unique method of combining terms, for example by typing in the Booleans “AND” or “OR” or by offering the facility of clicking on a “combine” option and

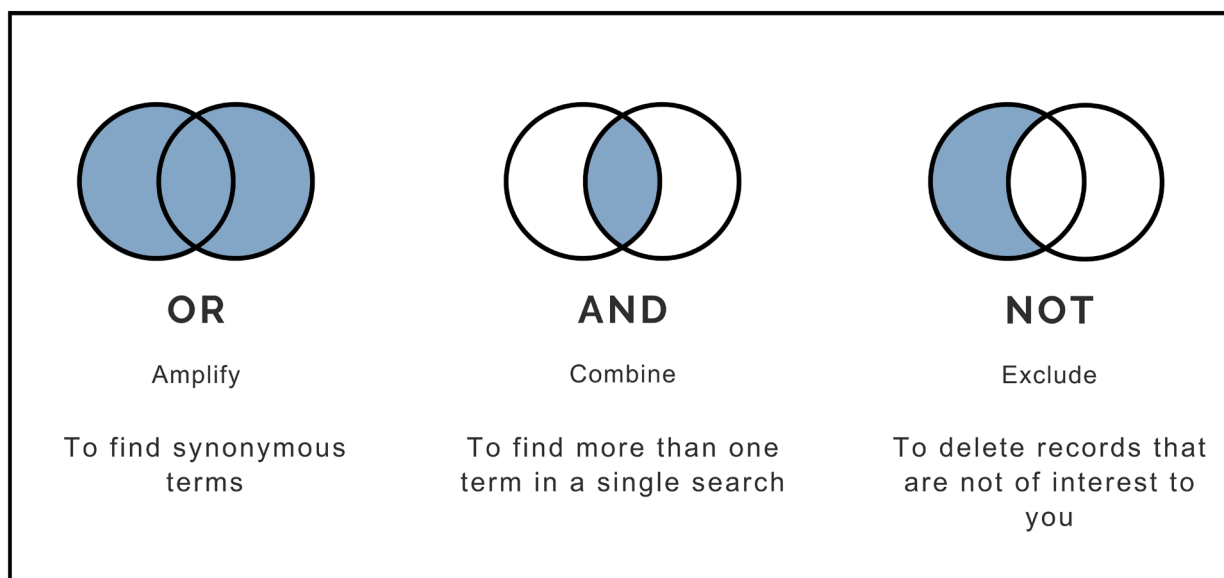


Figure 2 – Boolean operators used to delimit subjects during the literature search.

Source: Adapted from¹⁶.

specifying the correct connector¹⁶. The Boolean operators need to be in capital letters (OR, AND), as some databases do not accept Booleans in lowercase letters, at the risk of confusing search results^{8,18}. The proper use of quotation marks is necessary to ensure that the search is conducted exactly as the terms were typed, generally used for compound words⁸. Chart 1 illustrates a search strategy.

Thus, accessing the help section of databases and relying on the guidance of librarians can be fundamental in determining the appropriate search strategy¹⁶.

Step 6: Adapting the search strategy for other databases

Once the terms have been combined with the Boolean operators and according to the acronym selected, it is necessary to adapt the search strategy to all the information sources selected in the study. The implementation of a robust search strategy for different sources is a relevant stage in the review process, requiring a careful and adaptive approach. Consistency in search terms is essential to preserve the integrity of the research, while flexibility is fundamental to meet the peculiarities of each platform^{3,9}.

When accessing databases such as Medline/PubMed, where MeSH terms play a significant role in indexing, maintaining this structure is essential. Taking the controlled descriptor “Nursing” as an example, the search strategy should be as follows: “Nursing”[Mesh] OR “Nursing” OR “Nursings”. By repeating the controlled descriptor “Nursing”[Mesh], without indicating the MeSH, the search will prioritize the indexed terms and will also extend to all fields (“Nursing”[MeSH Terms] OR “Nursing”[All Fields] OR “Nursings”[All Fields]), if some kind of limiter is not used. Thus, including MeSH terms in the search of this database provides standardized categorization that facilitates the retrieval of relevant studies. Adaptation in this context involves not only incorporating these controlled terms, but also understanding how the database interprets and relates the concepts^{26,27}.

It is imperative to recognize that each database operates with different nuances. Some platforms may have limited search functionality, which requires additional adaptations to the strategy, such as reducing the number of terms or performing multiple searches with different combinations of words^{8,12}. It will probably be necessary to repeatedly test the strategies, improving them as the results obtained from each database are analyzed.

Chart 1 – Example of literature search according to DeCS controlled terms and synonyms for the LILACS database search.

Question: What are the main databases (Intervention) used by nurses (Population) to identify relevant evidence in perioperative nursing (Context)?

Elements of the PICO acronym

Population: (“Enfermagem” OR “Nursing” OR “Enfermería” OR “Enfermeiras e Enfermeiros” OR “Nurses” OR “Enfermeras y Enfermeros” OR “Enfermeira” OR “Enfermeira Registrada” OR “Enfermeira e Enfermeiro” OR “Enfermeiras” OR “Enfermeiras Registradas” OR “Enfermeiro Registrado” OR “Enfermeiro e Enfermeira” OR “Enfermeiros Registrados” OR “Enfermeiros e Enfermeiras” OR “Nurse” OR “Nursing Personnel” OR “Registered Nurse” OR “Registered Nurses” OR “Enfermera” OR “Enfermera Registrada” OR “Enfermera y Enfermero” OR “Enfermeras” OR “Enfermeras Registradas” OR “Enfermero Registrado” OR “Enfermero y Enfermera” OR “Enfermeros Registrados” OR “Enfermeros y Enfermeras”)

Intervention: (“Base de Dados” OR “Database” OR “Base de Datos” OR “Banco de Dados” OR “Data Base” OR “Ferramenta de Busca” OR “Search Engine” OR “Motor de Búsqueda” OR “Buscador” OR “Motor de Busca” OR “Search Engines” OR “Fonte de Informação” OR “Information Sources” OR “Fuentes de Información” OR “Fonte de Dados” OR “Fonte de Informações” OR “Fontes de Dados” OR “Fontes de Informação” OR “Fontes de Informações” OR “Fontes dos Dados” OR “Fuente de Información” OR “Data Source” OR “Data Sources” OR “Information Source” OR “Source of Information” OR “Sources of Information” OR “Fuente de Datos” OR “Fuente de Información” OR “Fuentes de Datos”)

Context: (“Período Perioperatório” OR “Perioperative Period” OR “Periodo Perioperatorio” OR “Assistência Perioperatória” OR “Perioperative Care” OR “Atención Perioperativa” OR “Assistência na Fase Perioperatória” OR “Assistência no Período Perioperatório” OR “Cuidados Perioperatórios” OR “Cuidados Perioperatorios” OR “Cuidados Peroperatorios”)

Final search strategy

((“Enfermagem” OR “Nursing” OR “Enfermería” OR “Enfermeiras e Enfermeiros” OR “Nurses” OR “Enfermeras y Enfermeros” OR “Enfermeira” OR “Enfermeira Registrada” OR “Enfermeira e Enfermeiro” OR “Enfermeiras” OR “Enfermeiras Registradas” OR “Enfermeiro Registrado” OR “Enfermeiro e Enfermeira” OR “Enfermeiros Registrados” OR “Enfermeiros e Enfermeiras” OR “Nurse” OR “Nursing Personnel” OR “Registered Nurse” OR “Registered Nurses” OR “Enfermera” OR “Enfermera Registrada” OR “Enfermera y Enfermero” OR “Enfermeras” OR “Enfermeras Registradas” OR “Enfermero Registrado” OR “Enfermero y Enfermera” OR “Enfermeros Registrados” OR “Enfermeros y Enfermeras”)) AND ((“Base de Dados” OR “Database” OR “Base de Datos” OR “Banco de Dados” OR “Data Base” OR “Ferramenta de Busca” OR “Search Engine” OR “Motor de Búsqueda” OR “Buscador” OR “Motor de Busca” OR “Search Engines” OR “Fonte de Informação” OR “Information Sources” OR “Fuentes de Información” OR “Fonte de Dados” OR “Fonte de Informações” OR “Fontes de Dados” OR “Fontes de Informação” OR “Fontes de Informações” OR “Fontes dos Dados” OR “Fuente de Información” OR “Data Source” OR “Data Sources” OR “Information Source” OR “Source of Information” OR “Sources of Information” OR “Fuente de Datos” OR “Fuente de Información” OR “Fuentes de Datos”)) AND ((“Período Perioperatório” OR “Perioperative Period” OR “Periodo Perioperatorio” OR “Assistência Perioperatória” OR “Perioperative Care” OR “Atención Perioperativa” OR “Assistência na Fase Perioperatória” OR “Assistência no Período Perioperatório” OR “Cuidados Perioperatórios” OR “Cuidados Perioperatorios” OR “Cuidados Peroperatorios”))

Source: the authors.

In this context, the researcher's experience plays a key role. An in-depth understanding of the particularities of each database, combined with interactive testing, enables continuous refinement of the strategy. Collaborating with librarians and exploring the specific help resources of each platform are recommended practices to optimize the adaptation of the search strategy, guaranteeing a comprehensive and accurate search amidst the diversity of information sources^{3,8,12}.

When dealing with grey literature sources (documents not published in conventional sources, such as theses, dissertations and documents from government agencies and organizations), the approach may require more specific adjustments. In these instances, where the formalities of MeSH terms may not be universally applicable, the search strategy may need to simplify or restrict the terms. The unconventional nature of these sources demands a more flexible and creative approach to the selection and combination of terms and keywords^{19,20}.

Step 7: Conducting the pilot test

Before formalizing and registering the review protocol, it is important to conduct a pilot for the search strategy. This stage is essential to assess the effectiveness and sensitivity of the strategy before implementing it definitively, providing a valuable opportunity to identify possible gaps and adjust the parameters as necessary^{9,28}.

During the pilot, the search strategy is implemented on one or more databases relevant to the research topic. The objective is to assess the sensitivity and effectiveness of the strategy, identify possible problems, adjust parameters and, if necessary, include or exclude specific terms. In addition, this stage tests the combination of Boolean operators, verifies the applicability of subject descriptors and observes how the results align with the objectives of the review¹³.

By conducting a pilot search, researchers are able to test the sensitivity of the strategy in retrieving relevant studies and, at the same time, assess its accuracy in excluding irrelevant studies. This contributes significantly to refining the strategy, ensuring that it is sensitive enough to capture all relevant studies and, at the same time, sufficiently specific to avoid unnecessary results^{13,14}.

Identifying new terms or information during the pilot search is an essential advantage of this process. Sometimes new descriptors or synonyms can emerge, providing a more comprehensive and accurate understanding of the theme. In addition, it ensures familiarity with the specific characteristics of each database, contributing to specific adaptations that increase the effectiveness of the strategy^{14,21}.

The pilot test not only improves the accuracy of the search, but also saves time in the subsequent stage, when the strategy is definitively implemented. This is a primary principle in the review methodology, widely recognized by leading researchers and research organizations^{12,28,29}.

In addition to the pilot test, a peer review of the literature search strategy is essential to improve quality, comprehensiveness, and the correct application of the "AND" or "OR" connectors, and to reduce errors, including misspelled words³. Therefore, peer review is a fundamental process for improving the quality and comprehensiveness of the search, avoiding syntax errors and ensuring the correct implementation of the connectors¹³.

Validating the strategy with a research partner is an additional and valuable step. This collaboration not only ensures the reproducibility of the search, but also guarantees that the strategy comprehensively captures the focus of the search strategy. The exchange of ideas and perspectives contributes to further refinements and strengthens the robustness of the strategy. So, after developing an effective strategy, with satisfactory results in the databases, the next step is to document the process.

Step 8: Documenting the stages of the development of the search strategy

Throughout the review process, each phase of the search needs to be meticulously documented in order to report and update requirements. The search report must be presented in such a way that each study can be reproduced or at least properly evaluated. Such tools as the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) checklist³⁰ and the PRISMA-S Statement for Reporting Literature Searches in Systematic Reviews¹³ are useful for this.

To ensure reproducibility, it is essential to provide the search report exactly as it was recorded in the information sources and databases¹³. It is recommended to copy and paste the search strategy into a Word document after it has been inserted into each database. In addition, searches should be described in narrative form, detailing limiting factors applied and reasons behind decisions¹⁸.

Researchers can make a printout or capture images of the search history from all information sources for later replication. Maintaining uniformity in the search approach ensures the consistent use of keywords, descriptors and alternative terms identified in all databases¹⁶.

Developing a search strategy that balances sensitivity and specificity is challenging and demands practice¹⁴. Systematic searching should be incorporated as a practice, avoiding disorganized approaches to searching for evidence¹⁶.

The importance of registration is associated with several fundamental aspects, as highlighted in Chart 2.

At the end of this section, a figure summarizes these steps, to facilitate visualization and understanding by the reader (Figure 3).

Chart 2 – Fundamental aspects of detailed recording of the search strategy.

Fundamental aspects for recording the search strategy	
Reproducibility and Transparency	A precise record of the search strategy enables other researchers to reproduce exactly the same process, guaranteeing transparency and reproducibility. This is essential for validating and verifying the findings.
Peer Review	When submitting the study for peer review, detailed registration facilitates critical analysis of the search strategy. Reviewers can assess the logic, comprehensiveness and sensitivity of the search, identifying possible flaws or areas for improvement.
Adaptation for Other Reviews	The record serves as a guide for future revisions or updates to the search. This is particularly useful when you want to expand or adjust the search strategy to incorporate new terms, databases or inclusion criteria.
Error Identification and Improvement	During the review of the record, it is possible to identify misspelled words, syntax errors or even possible mistakes in the application of Boolean operators. This detailed review helps to improve the quality of the strategy.
Compliance with Standards and Guidelines	In many fields, there are specific guidelines, such as PRISMA and PRISMA-S, which require the transparent presentation of the search strategy. Proper documentation ensures compliance with these standards, strengthening the credibility of the review.
Performance Analysis	By documenting the steps of the strategy, researchers can analyze the performance of the search, including the number of results obtained, sensitivity and specificity. This analysis is valuable tool for adjusting the strategy and optimizing the findings.

Source: Adapted from 13,23,30.

KNOWLEDGE SYNTHESIS METHODS



Figure 3 – Steps for developing the search strategy in knowledge synthesis methods.

Source: The authors.

FINAL CONSIDERATIONS

Recognizing that developing a search strategy is a complex, repetitive and continuous process is essential, especially in the area of nursing, where evidence-based practice plays a central role in the quality of care. This process requires patience, dedication and constant improvement. Regular practice combined with in-depth reading is indispensable for developing skills in identifying and selecting relevant terms. Adopting a collaborative approach that integrates the expertise of the researcher with the knowledge of the specialist in scientific information is fundamental to overcoming challenges inherent in this process.

The proposal presented in this study consists of eight steps, and offers a structured guideline that standardizes best practices in the development of search strategies, helping to address challenges in an organized and effective way. Unlike fragmented guides or scattered guidelines, the strategy provides a clear path from problem definition to detailed search documentation, promoting efficient integration of key steps. A relevant feature of this proposal is the emphasis on adapting the strategy to different databases, considering the specificities of each to optimize the findings, which is particularly important for nursing, which includes a wide range of topics and approaches.

By providing a practical and applicable framework, the guideline not only improves the quality and effectiveness of evidence synthesis, but also methodologically advances the field of nursing by enabling researchers to conduct more precise and comprehensive searches. This systematic approach, centered on collaboration and continuous practice, represents a differentiator that can transform literature search practices, promoting high-quality knowledge syntheses capable of responding effectively to health and nursing research needs and questions.

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NOTES

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