

Systematic literature search for writing a review

The ability to carry out a competent literature review is an essential skill for a researcher.

A review of the literature is important because you acquire an understanding of your topic, by reviewing the content of previous related research, how it has been researched, and what the key issues are. In short, it is a written overview and appraisal of the existing knowledge on a topic.

A systematic literature search is most commonly used for writing a review at the start of a PhD trajectory. Systematic means to search for relevant literature in the field of a well-defined topic in an ordered way, by doing it according to a systematic plan. In a comprehensive definition of Arlene Fink (1988): “research literature review is a systematic, explicit and reproducible method for identifying, evaluating and synthesizing the existing body of completed and recorded work produced by researchers, scholars and practitioners”.

A wide range of free and commercial tools to tackle single tasks within the systematic review process (such as Rayyan, RobotReviewer and SWIFT-Review) are available to support the process of searching and reviewing literature. A community-driven web-based catalogue of systematic review tools is available via the [Systematic Review Toolbox](#).

The following steps are essential in the process of finding relevant literature for your review:

1. EXPLORE, CHOOSE, FOCUS YOUR TOPIC

Explore the variety of approaches and focus on the specific aspect that you want to write about, based on an interest to a topic of your essay in the broadest sense. Often your research topic will start as a question. Formulate an answerable research question. The research question provides the structure for the literature review. It leads to the relevant literature.

Examples of well-defined research questions:

- What is the development of radioactive waste policy in the Benelux from 1980 to 1995?
- Is a short versus a standard duration of antibiotic therapy for urinary tract infection in children more effective?

2. IDENTIFY MAIN CONCEPTS AND SEARCH TERMS/KEYWORDS

Break down your research question, statement or topic into its main concepts. Formulate search terms reflecting (aspects of) these concepts. Use imagination, foreknowledge, and brainstorming and make use of dictionaries, encyclopedias and handbooks to add more relevant search terms.

Why? The words that you choose to describe your topic might be different from those used by an author or by the database you are searching in. You will therefore want to come up with some alternative words. Think about any synonyms, plural words, narrower or broader terms, related concepts etc.

If available, include keywords used in key articles published in the field of your topic.

Make use of a visual thesaurus like [Visualthesaurus](#) or [Visuwords](#). For biomedical themes the [Coremine medical](#) mind map tool can help you.

Use the [Search Planning Form](#) to structure your search with key concepts and search terms.

3. SELECT RELEVANT SOURCES

Select the databases or bibliographies most suitable for your research topic via the link [databases](#) in the Online Library. Although each database or bibliography is subject related, there is an overlap in content. Therefore, it is recommended to search in several databases.

Consult guides, tutorials and manuals via the [More info & support](#) button of each database.

For each database, create a personnel account for saving your search history!

Start your search with words related to your subject. Next to that, if available, use the database’s controlled vocabulary (thesaurus or subject index). The controlled vocabulary keywords identify topics central to the article. A great advantage of using controlled keywords is that articles on the same topic are indexed with the same term, even if authors use different terms.

Add those controlled terms to your [Search Planning Form](#).

Remember that when you search in different databases, you may need to use other search terms/keywords/controlled vocabulary.

4. CONSTRUCT THE SEARCH

Search within “all fields” or more specific within title and abstract using the words of your first concept. If available, also use the controlled terms in the search. Repeat this for the second concept of your research topic, and so on.

Make use of your Search History (if available) to combine the separate searches in the database. Via your Search History, you can also save, retrieve and re-use your searches.

Use the Boolean operators AND/OR/NOT and if available truncation * to improve your search results. First, combine the separate searches with OR for similar keywords. The result will be to find more articles about the similar topic. Next, connect those combined searches with AND for the different words/keywords/key concepts. The result will be to find less articles but on all the topics referring to your words/keywords/key concepts.

Date of Search: 17-01-2016

Your research question:
 What is the development of radioactive waste policy in the Benelux from 1980-1995?

	Concept 1	AND	Concept 2	AND	Concept 3	AND	Concept 4
Synonyms / different spellings/ Alternative -/ Controlled keywords	radioactive		waste		policy		Benelux
	Search terms		Search terms		Search terms		Search terms
	radioact*		waste		polic*		Benelux
	OR		OR		OR		OR
	radiation		disposal*		polit*		Netherlands
	OR		OR		OR		OR
	atomic		storage*				Belgium
	OR		OR		OR		OR
	nuclear						Luxemburg
	OR		OR		OR		OR
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Make use of the limiters as language, age, time span, research methodology etc If available in the database.

A systematic search is an iterative process. Constantly evaluate, validate, or verify your search results, and revise and re-run the searches if necessary.

Make sure that you are confident about you search query in one database before starting to search in another database.

5. RECORD THE SEARCH

Keep track of which information sources you have used how you have searched them and what results you have obtained. Keep good record of all the steps taken in your search. You may need to go back to an earlier step and adjust your search terms. Your search or search history might also be required to be part of the methods section of your manuscript .

Save your search strategy and the inclusion/exclusion criteria. If you want to re-run searches at a future date, use the save facilities within the database by creating a personal account. Save your queries within your personal account.

Use a bibliographic reference tool as [EndNote](#) to manage your references. After finishing your search in a database, export all articles selected to your EndNote library. Repeat this if you searched in multiple databases.

Check the button **More info & support** > Guides within the database for more information about exporting references to EndNote.

6. OVERVIEW THE SEARCH

How much literature do you need to look at, how far back do you need to go? If you want to find all relevant publications on a certain topic, you need a broad and sensitive search. Include as much of the relevant search terms and search within multiple databases.

However, the risk is getting (a lot of) non-relevant articles in your selection.

If you just want the key articles on the topic perform a restricted search strategy using just the most relevant search terms is sufficient. However, there is a risk of missing relevant articles.

Rule of thumb: your search is near completion when you discover that new articles only bring familiar findings.

7. IMPROVING YOUR SEARCH

If you retrieve too many citations use more specific (narrower) search terms, add search terms or use the 'limits' feature to restrict citations.

In case of retrieving too few citations search again with alternative search terms, use more general (broader) search terms or explore related articles, reference lists or thesaurus.

Make sure that key publications (that you are aware of) are included in your search results!

There are further steps to find articles that might have been missed. Examine the reference list in the relevant articles for cited references, especially for recent articles. Otherwise, search more specific in relevant scientific journals. A citing reference search is also possible: which studies or articles point to a relevant article in your list.


Watch the [video](#) (7.17 min) from the Medical Library at Yale University for more information.

8. KEEP UPDATED

After finishing your searches new articles could have been published. To stay informed of new published articles make use of e-alerting services or re-run the saved searches automatically within your personal account of the database.

9. REVIEW THE SELECTION

Before starting reading abstracts of the selected articles, remove duplicates from your selected references in your EndNote library by selecting References > Find Duplicates. Check the EndNote help for more information.

Import the PDFs of the articles in your EndNote library via the button . If the articles are available via the UM, the PDF's are added to your selection.

To get the most out of this extra service, you have to enter several settings when using EndNote on your own computer: Manual (in PDF) on [Finding Full text with EndNote](#). Be aware: this is not a fool proof mechanism but can help to import PDF documents into EndNote.

For the references you selected, you have to decide which articles are appropriate for inclusion in your review. By reading the abstracts you have to decide which articles are relevant or not. Define exclusion reasons/criteria and label those articles as not relevant for your review. Use the [PRISMA flow diagram](#) for this selection process.