

Systematic Literature Review

This document is not a detailed manual on how to write a systematic literature review. There are many books and websites that can help you with that.¹ The purpose of this document is to explain the methodology and pinpoint the possible role of the library within the process.

What is a systematic literature review?

The method was developed within the field of medicine to synthesize the vast growing number of knowledge. Each year an enormous amount of research papers are published, often enough conflicting with each other, which makes it difficult to formulate guidelines and best practices. A systematic review therefore wants to obtain a complete overview of all the existing research within a certain subject, make a critical evaluation and formulate a general conclusion. The method is now being used in other disciplines as well.

A systematic review is a completely new piece of research on its own, albeit a secondary one, with the aim to gain new insights. Just like with any other research it therefore has a research question, a methodology, an analysis, As you can conclude from its name, having a systematic approach to all this is essential, which means you need to work objectively and transparently based on a predefined, detailed strategy, making the research reproducible. Guidelines like those of the Cochrane Collaboration are often used for this aim.

Different steps in a systematic literature review

The key building blocks of a systematic review are: a research question, a reproducible search strategy, clearly stated selection criteria, an assessment of the validity of the findings, a systematic analysis and a conclusion. By and large, these components also make up the different steps in your own research process.

1) Research question

Your research question must be clear, specific and answerable. Not “How can diabetes be treated?”, but “Is X an effective treatment for Diabetes Melitus type 2?”. Don’t forget to start with a thorough investigation on whether your research has already been done.



Before you start, it is a good idea to register a systematic review protocol, which immediately makes your work visible to other researchers so they don’t start with the same research. The protocol serves as a kind of road map and gives a detailed description of which methods will be used: which selection criteria for inclusion or exclusion, which databases, which search terms, You can register your protocol at PROSPERO, the Cochrane Collaboration or the Campbell Collaboration for example.

Your research question will also deliver you your first research terms. Based on your own knowledge and by reading through the existing literature, you can expand this list with as many alternatives as possible.. Think of MeSH or other subject terms, synonyms, abbreviations, derivatives, broader or narrower terms, The more terms you have, the better, because you need to make your search as exhaustive as possible to find all the relevant literature. Think of it as a funnel: first you want to find as many studies as possible to make sure you have everything, so you can then filter out all the relevant studies bases on your predefined selection criteria.

2) Search strategy

To find published studies you will need to consult bibliographical databases. Make sure you use as many relevant databases as possible (for medicine for example this would be PubMed, Medline, Web of Science, Scopus, Cochrane Library, ...). Each database differs in content and search options, so you might have to adjust your search query each time.

¹ For a detailed manual within the field of medicine, you can use: Gebruers, Nick & Meeus, Mira. (2016). Health literacy: from reference to review, Acco, Leuven. For the social sciences, the following book might be useful: Peticrew, M., & Roberts, H. (2006). Systematic Reviews in the Social Sciences: A Practical Guide, Blackwell Pub.



Unpublished studies and “grey literature” are important too however. These can be conference papers, doctoral theses, government reports, ..., which you can find through colleagues and other researchers in your field, via Open Access repositories, Google Scholar,

To compose a good search syntax you will have to combine search terms with boolean and proximity operators, using wildcards and brackets as well. Often enough databases will allow you to use a specific search field that includes all field which might relate to a subject, but the choice for a specific search field depends on the options in that database. Filters like publication date, age category, document type, ..., might enable you to implement some of your selection criteria right away, either before or after searching.

Once you are happy with your search, you can export the results to bibliographical software such as Endnote or Mendeley.



Keep track of what you have already done: save your search history in the databases after registering for a personal account.

3) Selection criteria

Just like your search terms, you have made a detailed list of inclusion and exclusion criteria beforehand. These criteria relate to your subject of course and need to be well substantiated.

Once you have performed your searches in the databases and exported the literature into bibliographical software, you can start with the screening process. This can take up quite some time. A first screening is based on the titles and abstracts of the studies found: those where exclusion criteria are clearly mentioned in the title or abstract can be safely removed. The remaining studies can then be screened in more detail by reading the full text. If you have searched bibliographical databases, you will only have found the references of the studies and not the full text itself. So at this time you will have to try to get the full text of the remaining studies. In this second screening you will also have to give detailed arguments for each study on why you retained it or not.



Keep track of what you have done: never just delete references but systematically place them in different folders in your bibliographical software. This way you can always calculate how many studies have been included and excluded during the selection process.



Special apps exist to help you go through the studies and apply the selection criteria correctly. Rayyan is one example (<http://rayyan.qcri.org>). To report on the selection process in a systematic way, flowcharts are often used, describing the different steps in the process one by one. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) supplies a useful model for this.

4) Quality assessment

Apart from whether a study is relevant to your research, there is also the question of quality: is it without methodical errors and can the findings be considered trustworthy? Is there any risk of bias? Each study you include in your research should be assessed in this way.

There is no consensus on how to do this, but there are multiple tools available, mostly in the form of detailed checklists or scales. Depending on the sort of study and its research question different tools exist.² No matter which method you use, you should always clearly document on how you performed your assessment.

5) Analysis / results

² For example those offered by Cochrane: <https://methods.cochrane.org/bias/resources>.



In your analysis you first introduce the results of your research so far: which studies have been selected, what data you have obtained from them and what their quality assessment was.

Then you will have to bring all the data together. In most cases this will be via a quantitative analysis or meta-analysis, that is: looking at the data from the studies in a numerical, statistical way. Another possibility is a qualitative analysis which involves a more narrative approach, summarizing the conclusions verbally. This last approach might be necessary when there is too much diversity in the studies and the data is not comparable.

6) Conclusion

In your conclusion you would first try to summarize the results of the analysis. Whereas you will have represented them in an objective and 'sec' manner in the analysis itself, you can now place them in context and formulate your own critical findings.

There is a much more comprehensive checklist on the PRISMA website, listing and describing all the steps and components of a systematic review in detail.

How can the library help?

Because the UAntwerp library does not have reference librarians with detailed knowledge of the separate disciplines, the library's input is limited to the first stages of a systematic review (the research question, search terms and search strategy). But here we can contribute on several levels.

- Suggest relevant databases
- Improve your knowledge of the databases
- Help build or check your search syntax
- Learn you how to use bibliographical software like Endnote
- Help you locate the full text for articles
- ...

So do contact the library before, during or after you are going through these first stages (for example via helpdesk@library.uantwerpen.be), and we will be happy to see where we can help.

References and websites used

Gebruers, N. & Meeus, M. (2016). Health literacy: from reference to review, Acco, Leuven.

Petticrew, M., & Roberts, H. (2006). Systematic Reviews in the Social Sciences: A Practical Guide, Blackwell Pub.

Centre for Reviews and Dissemination (2009). Systematic Reviews. CRD's guidance for undertaking reviews in health care, University of York.

<https://methods.cochrane.org/bias/resources>

<http://prisma-statement.org/>