

Systematic Review

Research ReachOut @ the Library



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Introduction

This training manual serves two purposes:

- A workbook to accompany the 'Conducting a systematic review' workshop in the Research ReachOut program run by Murdoch University Library
- A standalone resource for self-directed or librarian-assisted learning.

This document works in conjunction with the [Systematic Review Guide](https://libguides.murdoch.edu.au/systematic/SR), an online resources maintained by the Library. Relevant sections of the Guide are linked throughout this workbook, and can be referred to for more information on systematic reviews, particularly the methodology.

What is a systematic review?

<https://libguides.murdoch.edu.au/systematic/SR>

A systematic review (SR) analyses evidence from the literature in order to answer a clinical research question.

It is a specific publication type, and is not a type of literature review. The following table highlights the differences between these two types of reviews.

Systematic Review	Literature (or Narrative) Review
Examines a clearly defined topic or question	Provides an overview of a topic
Uses an explicit search plan or protocol to minimize bias	Does not use an explicit search protocol or plan
A comprehensive search is undertaken to identify all potentially relevant studies	The search process may or may not include all potentially relevant studies
An explicit, predetermined protocol, that specifies inclusion and exclusion criteria, is used to select studies for the review	An explicit, predetermined protocol is not used to select the studies that are used to support the reviewers' recommendations
The quality of individual studies is rigorously appraised in a meta-analysis and a systematic synthesis of the results of included studies is undertaken with evidence "grades" applied to individual studies	A level of evidence rating system may be used to "grade" the quality and strength of individual studies
Provides evidence (research)	May be evidence-based, but is not evidence (research)
When evidence is lacking, the authors usually recommend further research	When evidence is lacking, the authors make recommendations based on their opinions and experience

Table 1: Differences between systematic and literature reviews

When/why would you conduct a systematic review?

The systematic review process

<https://libguides.murdoch.edu.au/systematic/conducting>

1. Starting a systematic review:
 - Check existing reviews/protocols to ensure proposed study is unique
2. Developing your clinical question:
 - Develop a specific question so your search will be relevant (use PICO or PICO)
 - Devise a protocol—Determine the inclusion/exclusion and eligibility criteria for further studies
3. Finding the literature:
 - Conduct a comprehensive search (your search strategy must be explicit and reproducible)
4. Appraising your results:
 - Select studies against eligibility criteria (follow your protocol)
 - Appraise studies—assess risk of bias in each study
 - Extract relevant data for analysis
5. Documenting your review:
 - Document the search process
 - Prepare a comprehensive report on all of the steps of your systematic review and present results

Starting a systematic review

<https://libguides.murdoch.edu.au/systematic/starting>

There are four things you should do when starting your review:

- Refine your research question using PICO or some other framework
- Search for existing systematic reviews or protocols
- Write your systematic review protocol
- Document all actions taken in the review.

PICO questions

<https://libguides.murdoch.edu.au/systematic/questions>

Before you can conduct a systematic review, you first need to define your research question. PICO is one method you can use to help ensure your question is formulated in way that would suit a systematic review. PICO is used for *quantitative* studies, but **other formulations** are available for qualitative questions.

Refer to the following pages of the Systematic Review Guide for more information:

- <https://libguides.murdoch.edu.au/systematic/defining>
- <https://libguides.murdoch.edu.au/systematic/PICO>

What is PICO? What does it stand for?

What makes a good PICO question?

Activity

- Complete Question 1 of the PICO worksheet ([PDF](#)) or ([web version](#))

Finding systematic reviews

<https://libguides.murdoch.edu.au/systematic/finding>

You should always check for existing reviews before you start your own.

Activity

- Go to PubMed (Databases > P > PubMed)
- Click 'Clinical Queries' in the middle of the home page
- Search for a recent systematic review on your topic or a topic of interest
- Skim systematic review and look at its content and structure

Systematic review protocols

What is a systematic review protocol?

A protocol is often registered/published before a review. Why is this important?

Documentation

<http://libguides.murdoch.edu.au/systematic/documenting>

Rigid documentation rules are a defining feature of systematic reviews, and so you should start recording everything you do from the start.

Both the search and the analysis processes need to be documented. This aids transparency and replicability—it makes the review 'evidence'.

Searching the literature: Databases

<https://libguides.murdoch.edu.au/systematic/literature>

You will need to search a number of databases during a systematic review. The important thing is to be comprehensive!

There are different types of databases, which may or may not be useful in your review:

- Abstracting & indexing (A&I) databases
- Full-text databases
- Citation databases
- Systematic review databases.

Abstracting and indexing databases

A&I databases will be the most crucial for your review, as they are optimised for searching. They contain abstracts of articles, as well as subject headings to assist with searching and determining the relevance of articles.

Subject headings:

- Tell you what the article is about, pulling out the major and minor subjects
- Are used consistently throughout the database (the same concept will always be referred to using the same heading, regardless of the author's wording) – this is called a 'controlled vocabulary'
- Are compiled into a thesaurus which you can use as a search tool.

Some [recommended A&I databases](#) are:

- PubMed/MedLine (biomedical)
- CINAHL (nursing & allied health)
- PsycINFO (psychology)
- ERIC (education & developmental psychology)
- Business databases (eg. organisational behaviour)
- InfoRMIT (Australasian journals that may be missed by larger international databasesA).

Full-text databases

As the name suggests, full-text databases contain the full-text of articles. There are several types of full-text databases, including:

- Publisher-based – eg. ScienceDirect (Elsevier), Springer Link
- Subject-based – eg. PsycArticles, BioMed Central
- Multidisciplinary – eg. Ingenta Connect, ProQuest Central.

Systematic review databases

The key full-text publishers of systematic reviews, and other evidence-based practice (EBP) material, are:

- Cochrane Library
- Joanna Briggs Institute.

These are generally most useful for locating previously published reviews (as we did previously in PubMed).

Citation databases

The two citation databases are:

- Web of Science Core Collection
- Scopus.

We will look at these in more detail in the next section on citation searching.

Which types of database would be most useful for your systematic review?

Activity

- Complete Question 7 of the PICO worksheet

Searching the literature: Other sources

Because of the need to be exhaustive, systematic reviews generally require attempts to locate information outside traditional databases. These can be found in a number of ways.

Citation searching

Citation searching refers to growing your body of literature by including works that have cited or are cited by your current set.

This involves:

- Checking reference lists of articles (some databases provide links directly to the older articles)—this is referred to as moving ‘backwards in time’
- You can also move ‘forwards in time’—Scopus, Web of Science and some other databases track newer articles that cite the work you are looking at and provide links to those articles.

By moving backwards and forwards, you can add more documents to your review. This process is known as ‘snowballing’.

Grey literature

<http://libguides.murdoch.edu.au/systematic/grey>

What is grey literature?

Why is it important to include this in a systematic review?

Other ways of getting literature

You are allowed to use a variety of other methods as long as you mention them explicitly in your report. These include:

- Papers provided by colleagues/supervisors
- Searching for the authors of articles you have found (who might have more publications in the same research area)
- Contacting researchers directly
- Any other sources.

Selection & appraisal of articles

<http://libguides.murdoch.edu.au/systematic/appraising>

This requires domain knowledge and is not an area of library expertise. However, the Library can provide tools and advise on process.

The process includes:

- Applying inclusion & exclusion criteria
- Critical appraisal of selected articles
- Identifying bias
- Second reviewers.

Activity

- Complete Questions 2, 3 & 6 of the PICO worksheet

Analysis, synthesis & reporting of results

<https://libguides.murdoch.edu.au/systematic/documenting>

Analysis of systematic reviews may include meta-analysis as an additional step, although a meta-analysis is also considered a separate publication type.

The [PRISMA Flow diagram](#) is used to document your selection process.

Some useful tools for tracking and managing your systematic review are:

- [EndNote](#)—to help manage your references and remove duplicates
- JBI SUMARI—provides systematic review templates and helps manage the workflow (login via Ovid and create a free account).

Conclusion

How does this relate to your research topic?

Take Home Activity:

- Complete Questions 4 & 5 of the PICO worksheet (refer to [Developing a search strategy](#) page for assistance).

Further assistance

Murdoch librarians can assist you in your systematic review by offering the following:

- Guidance on the systematic review process and formulation of research questions
- Advice on locating systematic reviews and other resources
- Assistance with selection and use of databases
- Review and provide general feedback on search strategies
- Instruction on use of EndNote and other research software.

Refer to the Systematic Review Guide for more information:

<https://libguides.murdoch.edu.au/systematic/home>

Please contact your [Subject Librarian](#) for:

- Online enquiries
- One-to-one appointments.