12 Steps to a Successful Systematic Review: From Research Question to Evidence

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13:00, Zoom
12 Steps in a Systematic Review

1. Research question
2. Scoping search
3. Study design decision
4. Building a team
5. Protocol registration
6. Literature search
7. Screening of results
8. Data extraction
9. Quality assessment
10. Synthesis of research
11. Interpretation
12. Write & publish
1 Research Question

What makes a good research question?

- **The 5 Ws**: Who, What, When, Where, Why
- **FINER**: Feasible, Interesting, Novel, Ethical, Relevant

A systematic review asks for a **precise** research question

Have in mind **question formats** like PICO(T), PICo, PEO, PECO, PIRT, SPIDER, SPICE, CLIP, ECLIPSE, or others

Think like a database (i.e. in database fields and concepts)

Ask yourself: How do authors write about your topic in scientific articles
2 Scoping Search

Explore your topic

• **Quick and dirty searches** in PubMed or Google Scholar

• **Ask AI Tools** like litmaps.com, researchrabbit.app, elicit.org, consensus.app
  → [BibMed's choice of AI tools](#)

• **Check registers** for systematic reviews on the same topic:
  PROSPERO, OSF, Research Registry, Inplasy, protocols.io, JBI
3 Study Design Decision

It's not always a systematic review that best answers your research question

Choose the type of review based on your research question:
- Scoping Review
- Narrative Review
- Rapid Review
- Realist Review
- Umbrella Review
- Evidence (Gap) Map
- And many more

Source: https://unimelb.libguides.com/whichreview
4 Building a Team

Systematic Reviews should be done by more than 1 person

- Reducing bias
- Subject experts
- Methods experts
- Information specialists
- Statistician (Meta analysis)
- Writing/editing experts
5 Protocol Registration

Plan your review and let others know what you are working on

A protocol is a research plan
- BibMed's template for PROSPERO (SciFlow)
- BibMed's template for PRISMA-P (SciFlow)

Registers for protocols
- PROSPERO, OSF, Research Registry ($),
- https://inplasy.com ($), protocols.io (0-$)

Register for Scoping Review protocols
- JBI

Contact support_med.ub@unibe.ch if you wish a Word document
6 Literature Search

Find all the relevant literature for your research question

• In **databases** like PubMed, Medline, Embase, Cochrane Library, PsycInfo, Scopus, Web of Science, etc.
• In **trial registers** like clinicaltrials.gov, ICTR, and many more
• **Gray literature** (e.g. theses, booklets)

➢ Your search has to be **systematic, transparent and reproducible**
➢ For a "real" systematic review search in **at least 3 databases**
➢ **Deduplicate records**
➢ If required: **update your search before publishing**

Don't worry!
We do this for you:
7 Screening the records

Go through all the records. Based on your criteria: exclude or include them for your study

1. Import references to:
   - Screening tools (Covidence, Rayyan, PICOPortal, EPPIReview, ASReview, etc.)
   - Reference management tools (EndNote, Zotero, Mendeley, Citavi, etc.)

2. Screen titles & abstracts

3. Screen full texts

4. Data extraction

Software tools to support the Systematic Review process

Citation Management Systems

Work smarter not harder: The PICOPortal

Document process in PRISMA flow diagram
Extract the data and/or information

- Quantitative: Data and numbers (are they comparable?)
- Qualitative: Information
- Sources (Study ID, author ID)
- Outcomes
- Study design
- Number of participants (and their characteristics)
- Results
- Etc.
- Excel, Word (Template from Cochrane), Covidence
9 Quality Assessment / Appraisal

How reliable are the investigated studies?

- **Risk of Bias** (Randomization of participants, outcome data, knowledge of assessor)
- **Relevance of studies** and data in relation to populations, interventions, outcome
- **Fidelity** of the implementation of interventions

**Tools & checklists:**

- RoB 2, AMSTAR, CATMAKER, BMJ Checklist, CASP, CEBM, GRADE, ICAHE, ROBINS-I, SIGN
Synthesis is a process of bringing together data from a set of included studies with the aim of drawing conclusions about a body of evidence. This will include synthesis of study characteristics and, potentially, statistical synthesis of study findings.

Useful frameworks: PICO (and other question schemes)

Cochrane Handbook Chapter 9
11 Interpretation

What do the results mean?

• Are they applicable, generalizable, valid and transferable?
• What are the conclusions?

Cochrane Handbook Chapter 15
12 Write/Report the Review

- Background
- Methods
- Results
- Discussion
- Conclusion
- Summary of Findings
- Tables

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Questions & Discussion

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