



Guidance notes on planning a systematic review

In contrast to the traditional or narrative literature review, systematic literature reviews use a more rigorous and well-defined approach to reviewing the literature in a specific subject area.

Most research starts with a literature review of some sort. However, unless a literature review is thorough and fair, it is of little scientific value. This is the main rationale for undertaking systematic reviews.

A literature review earns the adjective “systematic” if it is based on a clearly formulated question, identifies relevant studies, appraises their quality and summarizes the evidence by use of explicit methodology.

A systematic review is a means of identifying, evaluating and interpreting all available research relevant to a particular research question, or topic area, or phenomenon of interest. Individual studies contributing to a systematic review are called *primary studies*; a *systematic review is a form of secondary study*.

The advantages of systematic literature reviews are:

- Well-defined methodology makes it less likely that the results of the literature will be biased (*does not protect against publication bias in the primary studies)
- Can provide information about the effects of some phenomenon across a wide range of settings and empirical methods. If studies give consistent results, systematic reviews provide evidence that the phenomenon is robust and transferable. If the studies give inconsistent results, sources of variation can be studied.
- With quantitative studies, it is possible to combine data using meta-analytic techniques, increasing the likelihood of detecting real effects that individual smaller studies are unable to detect.

Features of a Systematic Literature Review

- Starts with a definition of the review protocol which specifies the research question being addressed and the methods that will be used to perform the review

- Based on a defined search strategy that aims to detect as much of the relevant literature as possible
- Search strategy is documented so that readers can assess its rigor and the completeness and repeatability of the process
- Requires explicit inclusion and exclusion criteria to assess each potential primary study.
- Specifies the information to be obtained from each primary study including quality criteria by which to evaluate each primary study.
- A prerequisite for quantitative meta-analysis.

Developing a review protocol – the components

- Background. The rationale for the survey. The research questions that the review is intended to answer
- The strategy that will be used to search for primary studies including search terms and resources to be searched.
- Study selection criteria. Study selection criteria are used to determine which studies are included in, or excluded from, a systematic review.
Eg. Only empirical works to be included? Or theoretical works focusing on the nature of the discourses, conceptual frameworks and models specific to the study phenomenon?

Eg. Concentration on published scholarly articles only or include commissioned reports, organizational projects and conference papers (grey literature)?

Common inclusion criteria:

- Set timeframe or publication date range
 - Language or national context
 - Main focus of the paper
 - Explicit methodology
 - Outcome measurements
- Study quality assessment checklists and procedures. The researchers should develop quality checklists to assess the individual studies. The purpose of the quality assessment will guide the development of checklists. The protocol should describe how the selection criteria will be applied e.g. how many assessors will evaluate each prospective primary study, and how disagreements among assessors will be resolved.

- Data extraction strategy. This defines how the information required from each primary study will be obtained. If the data require manipulation or assumptions and inferences to be made, the protocol should specify an appropriate validation process.
- Synthesis of the extracted data. This defines the synthesis strategy. This should clarify whether or not a formal meta-analysis is intended and if so what techniques will be used.
- Dissemination strategy.
- Project timetable. This should define the review schedule.

The 5 steps in conducting a systematic review

STEP 1. Frame the question (problem formation)

- Problem should be specified in the form of a clear, unambiguous and structured question BEFORE commencing
 - The populations
 - The interventions or exposures
 - The outcomes
 - The study designs
- Modifications only allowed on basis of alternative ways of defining the populations, interventions, outcomes, study designs become apparent or if false positives in 3rd step
- The CAMPBELL COLLABORATION **SAMPLE** framework
 - Is it **S**pecific?
 - Is it **A**nswerable?
 - Are there **M**easurable constructs?
 - Is it **P**ractical? Ie relevant for policy/practice?
 - Is it **L**ogical? Ie based on a theoretical or logical model?
 - Is it **E**mpirical? Can answers be attained using observable evidence?

STEP 2. Identify relevant works (data collection)

- Study selection criteria to be specified a priori and must flow directly from the review question
- Reasons for inclusion/exclusion criteria to be recorded
- Searches should be extensive
- Multiple resources should be searched
- No language restrictions

Methods of identifying potentially relevant studies

- Searching multiple bibliographic databases
- Scanning reference lists of existing reviews and eligible studies
- Scanning conference proceedings
- Hand-searching key journals
- Forward citation searching of seminal articles
- Contacting scholars in the area
- Searching the Internet

A central component of a quality systematic review is a comprehensive document search. A biased collection of studies will likely produce biased conclusions

- Tackle this by doing a systematic search to identify (ideally all) relevant works on a topic, ie. both published and grey literature
- Does not mean collecting studies independent of methodological quality
 - Selection for publication bias: peer-reviewed journal articles are more likely to show significant results than less formally published studies
 - Grey literature often not discovered through bibliographic databases

Document as you go

- Important to document and report on the search process as part of the broader systematic review
- Make transparent the method of identifying and collecting studies so that others can evaluate, critique and replicate your search procedures
 - Timeframe in which literature was selected
 - Methods used to evaluate and synthesize findings of the studies considered
- Classify & group articles by type and source

STEP 3. Assessing study quality (data evaluation)

- Selected studies to be subjected to a more refined quality assessment using general critical appraisal guides and design-based quality checklists
 - Indexing & summary system should capture title, author, purpose, methodology, findings and outcomes plus your own comments or key thoughts on the article (plus source and full reference)
- PQRS system: Preview, Question, Read, Summarize
- Adequate study design as a marker of quality
 - Most applicable when main source of evidence is randomized studies but these not always possible in social studies

Document evaluation

- Begin by examining the citation to determine relevance (title & abs)
 - Does it meet the criteria for the synthesis?
 - Is the methodology appropriate?
 - Is the subject within the defined scope?
 - If relevant, then examine the document itself
 - Watch also for reference to other studies not identified by your own database searches, eg. Unpublished conference papers, reports, reports of research conducted under grant, information about current research at other institutions

STEPS 4 & 5 Summarise the evidence & Interpret the findings

Structure of systematic reviews

Introduction: Include purpose & brief overview of the problem. Outline the literature sources and key search terms, search limits, etc. Comment on what was found in the literature giving the reader insight into the breadth and depth of the literature sourced and facilitating judgement of the validity of the claims being made.

Main body:

- Presents and discusses the findings from the literature
- Critically review methodologies of empirical research
- Remain objective. Reader should know that the reviewer has understood and synthesized the relevant information rather than just describing what other authors have found. Review should read like a critical evaluation of the information available on the topic, highlighting and comparing information from key sources

Conclusion: A concise summary of the findings, describing current knowledge and offering a rationale for conducting future research

Further readings

- Cooper, H. M., Hedges, L. V. and Valentine, J. C. (2009) *The handbook of research synthesis and meta-analysis*, New York: Russell Sage Foundation.
- Cronin, P., Ryan, F. and Coughlan, M. (2008) 'Undertaking a literature review: a step-by-step approach', *British Journal of Nursing (BJN)*, 17(1), 38-43.
- Khan, K. S., Kunz, R., Kleijnen, J. and Antes, G. (2003) 'Five steps to conducting a systematic review', *Journal of the Royal Society of Medicine*, 96(3), 118-121.
- Page, D. (2008) 'Systematic Literature Searching and the Bibliographic Database Haystack', *Electronic Journal of Business Research Methods*, 6(2), 171-180.
- Papaioannou, D., Sutton, A., Carroll, C., Booth, A. and Wong, R. (2010) 'Literature searching for social science systematic reviews: consideration of a range of search techniques', *Health Information & Libraries Journal*, 27, 114-122.