Systematic Reviews

Cindy Logan
clogan@k-state.edu
Livia Olsen
livia@k-state.edu
Kendra Spahr
kspahr@k-state.edu

Literature review
• General discussion of topic; specific question not required
• How studies were selected/excluded for review is not described
• Thorough search not required
• Differences in study design or study quality not addressed
• Review author bias probable

Systematic review
• Must start with a very specific question
• Specific inclusion/exclusion criteria are established before searching begins
• Systematic, rigorous, documented search is required; search for unpublished research
• Identify level of evidence and bias that may exist
• Potential for review author bias removed

Steps of a Systematic Review
• Clearly formulated, very specific question
• Decide on inclusion and exclusion criteria
• Systematic and explicit methods to identify relevant research
• Critically appraise selected research
  – Determine level of evidence
  – Determine where bias may have entered the study
• Analyze and interpret results
Clearly formulated, very specific question

- Very, very well thought out and specific
- In healthcare this is called a clinical question, could be considered the research question
- Healthcare uses a P I C O format for the question
- Poor examples of a specific question:
  - Does a baby aspirin a day help prevent heart attacks?
  - Will Pesticide X prevent alfalfa weevils in alfalfa?

Decide on inclusion and exclusion criteria

- Inclusion criteria defines the elements of the research that MUST be found in a study
  - Examples: Synonyms, location, language
- Exclusion criteria are the elements that will eliminate a study from being reviewed/considered
  - Examples: Broad synonyms, location, language, age, time frame
Systematic and explicit methods to identify relevant research

- Strict procedure
- All possible databases searched; noting the years of coverage for the database; noting the date the review author searched the databases
- Scan the references of selected articles to include those references
- Articles of experts in the area are included
- Search for gray literature
- An exhaustive search must be conducted and documented

Documenting articles selected

- Total the number of articles from databases and other sources = note that number
- Number of duplicates removed = note that number
- Number of articles excluded BY TITLE AND BY ABSTRACT following application of inclusion/exclusion criteria = note that number

Have an odd number of reviewers to resolve ties, differing opinions
Critically appraise selected articles

- Create a table that lists the basics of information: author(s), publication title and date, article title and information regarding subjects
- Determine the level of evidence
- Determine where bias could have entered the study

Analyze and interpret results

- Qualitative or quantitative
- Quantitative includes the meta-analysis (using statistical techniques to synthesize the data from several studies into a quantitative estimate or summary effect. Not just looking at clinical significance but the strength of the relationship)

Guiding Entities

- PRISMA – Provides flow diagram and checklist
- PRESS: Peer Review of Electronic Search Strategies (2015 Guideline explanation and Elaboration)
- Prospero – Repository for systematic reviews ongoing/done
- Cochrane Collaboration – Non-profit, international organization that promotes, supports, disseminates systematic reviews and meta-analyses.
- Campbell Collaboration – Social sciences focus (policy and practice)
- ROSES - RepOrting standards for Systematic Evidence Syntheses in environmental research
- CEE – Collaboration for Environmental Evidence
Interesting statistics

• Studies have shown that a typical SR takes an average of 1,139 hours to complete. [almost 48 24-hour days; almost 114 10-hour days; almost 3 months of doing nothing but work on the SR]

• The time from the date of the last search to SR publication is commonly over one year.

• Median time from the publication of a primary research study until a SR featuring that research is published has been between 2.5 to 6.5 years.

What are some other “review” options?

Without transparent reporting, even well-designed reviews will fail to show their methodological strengths, undermining their utility in decision-making contexts (Pussegoda et al. 2017)

Cindy Logan – clogan@k-state.edu
Livia Olsen - livia@k-state.edu
Kendra Spahr - kspahr@k-state.edu

Where to find your librarian: https://www.lib.k-state.edu/library-contacts