Conducting a systematic review for Researchers & HDR students Research Week 2019
Workshop overview

• What is a systematic review?
• PICO questions
• Finding systematic reviews
• Systematic reviews, protocols & documentation
• Choosing a database
• Non-database searching
• Selection & appraisal; analysis, synthesis & reporting of results
Learning outcomes

By the end of this workshop, you should:

• Understand the difference between a literature review and systematic review
• Understand the process of conducting a systematic review
• Know how to seek help from library
What is a Systematic Review?
Systematic reviews

https://www.youtube.com/watch?v=04E8JiXY2s4
Group Activity

Online poll

- [https://PollEv.com/bryanchan521](https://PollEv.com/bryanchan521)

Which of the following describe:

- Systematic reviews
- Literature reviews?
## Systematic review or Literature review?

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>SR</th>
<th>LR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examines a clearly defined topic or question</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td>May be evidence-based, but is not evidence (research)</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>Does not use an explicit search protocol or plan</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>An explicit, predetermined protocol, that specifies inclusion and exclusion criteria, is used to select studies for the review</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td>A comprehensive search is undertaken to identify all potentially relevant studies</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td>A level of evidence rating system <em>may</em> be used to &quot;grade&quot; the quality and strength of individual studies</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>When evidence is lacking, the authors make recommendations based on their opinions and experience</td>
<td>x</td>
<td>✓</td>
</tr>
</tbody>
</table>
Systematic Review guide

http://libguides.murdoch.edu.au/systematic

- What you need to know about systematic reviews, particularly the methodology
- Covers the material in this workshop

We will be referring to this frequently:

- Library homepage > Subject Guides > All Guides
- Use Library Search: see bottom of right side bar
- Murdoch University homepage: search engine
## Systematic reviews vs. Literature reviews

<table>
<thead>
<tr>
<th><strong>Systematic Review</strong></th>
<th><strong>Literature (or Narrative) Review</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Examines a clearly defined topic or question</td>
<td>- Provides an overview of a topic</td>
</tr>
<tr>
<td>- Uses an explicit search plan or protocol to minimize bias</td>
<td>- Does not use an explicit search protocol or plan</td>
</tr>
<tr>
<td>- A comprehensive search is undertaken to identify all potentially relevant studies</td>
<td>- The search process may or may not include all potentially relevant studies</td>
</tr>
<tr>
<td>- An explicit, predetermined protocol, that specifies inclusion and exclusion criteria, is used to select studies for the review</td>
<td>- An explicit, predetermined protocol is not used to select the studies that are used to support the reviewers’ recommendations</td>
</tr>
<tr>
<td>- 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 &quot;grades&quot; applied to individual studies</td>
<td>- A level of evidence rating system may be used to &quot;grade&quot; the quality and strength of individual studies</td>
</tr>
<tr>
<td>- Provides evidence (research)</td>
<td>- May be evidence-based, but is not evidence (research)</td>
</tr>
<tr>
<td>- When evidence is lacking, the authors usually recommend further research</td>
<td>- When evidence is lacking, the authors make recommendations based on their opinions and experience</td>
</tr>
</tbody>
</table>
Discuss

When/why would you conduct a systematic review?

• A systematic review is a research methodology like experimental and qualitative methods

• A literature review is not research, but has an important role in supporting the research endeavour
PICO questions
Discuss

• What is PICO? What does it stand for?
PICO question video

https://youtu.be/j5LccGp9RW8
Group Activity

• Complete Question 1 of the PICO worksheet (refer to the Systematic Review Guide)
Finding systematic reviews
Check for existing reviews

- This should be the **first step** in any systematic review!

(https://libguides.murdoch.edu.au/systematic/undertaking)
PubMed


- Free
- Automatic term mapping
- Clinical queries (includes systematic reviews)
Activity

• Go to PubMed (just Google it!)
• 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
Discuss

How does this relate to your research topic?

• Your research might not be suitable for the systematic review methodology

• If so, then the rest of this workshop will not apply to you

• There is a separate workshop for advanced ‘systematic’ searching of the literature
Break time!

- 5 min
- Feel free to leave if you are not conducting a systematic review
BREAK
Systematic reviews, protocols & documentation
Documenting a systematic review

- Defining feature of systematic reviews
- Both the search and the analysis processes need to be documented
- Aids transparency and replicability – makes the review ‘evidence’

(http://libguides.murdoch.edu.au/systematic/documenting)
Discuss

- What is a protocol?
Protocols

• “A systematic review protocol describes the rationale, hypothesis, and planned methods of the review. It should be prepared before a review is started and used as a guide to carry out the review.” (PRISMA, 2015)

http://prisma-statement.org/Protocols/
Discuss

- A protocol is often published before a review.
- Why is this important?
Choosing a database
Choosing databases

You will need to search a number of databases:

• Disciplinary vs multidisciplinary
• Citation databases
• Systematic reviews/EBP databases

Be comprehensive!
Databases

- PubMed/MedLine (biomedical)
- ProQuest (PsycINFO, ERIC, Health Collection)
- CINAHL (nursing & allied health)
- Informit (Australian content)
- Cochrane Library/Joanna Briggs Institute (systematic reviews)
- Business databases
- Scopus/Web of Science (citations)
Activity (individual)

Look for relevant databases for your topic via:

• Library website – Database page, by subject
• Subject Guides

Complete Question 7 of the PICO worksheet
Non-database searching
Non-database searching

- Citation searching
- Grey literature
- Other ways of getting literature
Citation searching

- Backwards – reference lists (on database full record)
- Forwards – [Scopus](https://www.scopus.com), Web of Science and Google Scholar
- ‘Snowballing’
Grey literature

- What is grey literature?
- Why is it important to include this in a systematic review?

https://vimeo.com/119080035

Systematic Review guide:
http://libguides.murdoch.edu.au/systematic/grey
Other techniques

Must be explicitly mentioned in SR report:

- Papers provided by colleagues/supervisors
- Search for the authors of articles you have found
- Other sources
Selection, appraisal, analysis & reporting
Selection, appraisal & analysis

- Requires domain knowledge
- Not an area of library expertise, other than to provide tools
Selection & appraisal

Includes:

• Developing and applying inclusion & exclusion criteria
• Documenting your selection process
• Critical appraisal of selected articles
• Identifying bias
• Second reviewers

http://libguides.murdoch.edu.au/systematic/appraising
Levels of evidence

- **Level I**: Systematic reviews of randomised controlled trials
- **Level II**: Randomised controlled trials
- **Level III-1**: Pseudo-randomised controlled trials
- **Level III-2**: Cohort studies, case-control studies
- **Level III-3**: Comparative studies with historical control, single-arm studies
- **Level IV**: Case series

Activity (individual)

- Complete Questions 2, 3 & 6 of the PICO worksheet
Analysis, synthesis & reporting of results

• May include meta-analysis

PRISMA Flow diagram
EndNote

- Manage your references (eg. remove duplicates)
  (Currently version X8)
Review

• What is the value of a systematic review?
• Why is a PICO question important?
• What are the key databases for your research?
• What other search techniques/sources should you use in a systematic review?
• Explain importance of documentation in systematic reviews
Conclusion
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Homework

• Q4 & Q5 of the PICO worksheet
• Refer to your Subject Librarian for assistance
Questions
Feedback

• Please complete the Research Week survey form which will be emailed to you

• Your feedback is greatly appreciated!
Need help?


- Enquiry service
- Book an appointment with your Subject Librarian

Subject Librarian’s details also on Subject Guide
Example topic

• Are school-based programs effective in reducing high-risk behaviour among Australian Indigenous teenagers?

<table>
<thead>
<tr>
<th>Component</th>
<th>Concept</th>
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<tbody>
<tr>
<td>Population</td>
<td>Australian Indigenous teenagers</td>
</tr>
<tr>
<td>Intervention</td>
<td>School-based programs</td>
</tr>
<tr>
<td>Comparison</td>
<td>None</td>
</tr>
<tr>
<td>Outcome</td>
<td>Effective in reducing high-risk behaviour</td>
</tr>
</tbody>
</table>
PubMed search strategy

((indigenous OR aboriginal) AND Australian) AND (adolescent OR teenage) AND (high risk AND behaviour) AND school