Conducting Systematic & Scoping Reviews: An Overview

Updated: Dec. 9, 2021
Overview

• Differences between scoping and systematic reviews
• Selecting a review (indicators)
• The review process
• Reporting guidelines and protocol development

GalterGuides

• Systematic Reviews
• Scoping Reviews
• Reporting Research and Evaluating Studies
• Rayyan

Classes

• Conducting a Systematic Review: Part 1 - Planning the Process
• Conducting a Systematic Review: Part 2 - Tools & Resources
• Conducting a Scoping Review
• EndNote
# Systematic Reviews vs Scoping Reviews

What are the differences?

<table>
<thead>
<tr>
<th><strong>Systematic Review</strong></th>
<th><strong>Scoping Review</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Attempts to <strong>identify</strong>, <strong>appraise</strong> and <strong>synthesize</strong> all the empirical evidence to answer a <strong>specific [and focused] research question</strong>.</td>
<td>Follows a systematic approach to <strong>map</strong> evidence on a topic and <strong>identify main concepts</strong>, <strong>theories</strong>, <strong>sources</strong>, and <strong>knowledge gaps</strong>.</td>
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</tbody>
</table>
Scoping Reviews vs Systematic Reviews

What are the differences?

<table>
<thead>
<tr>
<th></th>
<th>Scoping Reviews</th>
<th>Systematic Reviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authors</td>
<td>One or more authors</td>
<td>Team-based (multiple authors)</td>
</tr>
<tr>
<td>Research question</td>
<td>Focus or broad question(s)</td>
<td>Focused question</td>
</tr>
<tr>
<td>Eligibility criteria</td>
<td>Flexible</td>
<td>Set/Fixed/Developed a priori</td>
</tr>
<tr>
<td>Search strategy</td>
<td>Iterative, revisions acceptable</td>
<td>Set/Fixed/Developed a priori</td>
</tr>
<tr>
<td>Results</td>
<td>“Larger” result sets</td>
<td>“Fewer” results</td>
</tr>
<tr>
<td>Appraisal</td>
<td>Optional</td>
<td>Required</td>
</tr>
<tr>
<td>Protocol &amp;</td>
<td>PRISMA-ScR</td>
<td>PRISMA-P</td>
</tr>
<tr>
<td>reporting guideline</td>
<td></td>
<td>PRISMA 2020</td>
</tr>
<tr>
<td>Analysis</td>
<td>Overview and thematic</td>
<td>Critically appraised formal synthesis</td>
</tr>
</tbody>
</table>
When to Consider a Systematic Review

What are key indicators that a systematic review might be right for you?

Aim is to answer a *focused*, clinical question

- **Too specific**
  - Insufficient literature

- **Just right**

- **Too broad**
  - Over-abundance of literature
When to Consider a Systematic Review

What are key indicators that a systematic review might be right for you?

Consider conducting a systematic review if you hope to achieve any of the following goals:

- Confirm current practice/ address any variation/ identify new practices
- Address the **feasibility, appropriateness, meaningfulness or effectiveness of a certain treatment or practice**
- Identify and investigate conflicting results
- Produce statements to guide decision-making

When to Consider a Scoping Review

What are indicators that a scoping review might be right for you?

• Research question
  • Broad research question or topic
  • Multiple (broad) research questions
  • Multi-part research question

• Clarify or examine key concepts, topics or areas

• Conduct a landscape/environmental scan

• Identify knowledge gaps
When to Consider a Scoping Review

What are indicators that a scoping review might be right for you?

• A precursor to a systematic review
• Impractical to conduct risk of bias assessments
• Incorporate multiple study designs
The Review Process

Key sources

**Cochrane handbook for systematic reviews of interventions**

**Scoping studies: towards a methodological framework**

**JBI Manual for Evidence Synthesis**
The Review Process

1. Identify the research question
2. Identify relevant studies
3. Study selection
4. Extract/chart the data
5. Collate, summarize and report results
Step 1 – Identifying the Research Question

The research question(s) shapes all aspects of the review

**PICO**
- **Patient, population, problem,**
- **Intervention or exposure**
- **Comparator,**
- **Outcome(s)**

*Framework commonly used for systematic reviews*

**PCC**
- **Patient, population, problem**
- **Concept**
- **Context**

"PCC is recommended as a guide to construct a clear and meaningful title and inclusion criteria for a scoping review" - JBI
Look for Existing Reviews

Are there already published or in progress reviews on your topic?

• Search these databases:
  • Cochrane Database of Systematic Reviews
  • PubMed
  • PROSPERO
Step 2 – Identifying Relevant Studies

Identify relevant studies with a comprehensive search strategy

**Review Search Strategy**

- Comprehensive
- Consider multiple databases
- Consider various types of evidence
- Iterative
  - revisions accepted for scoping reviews
- Document

See Galter’s Information Sources page for more databases.
Step 3 – Study Selection

Select relevant studies based on your eligibility criteria

Screening tools
- Covidence
- Rayyan

<table>
<thead>
<tr>
<th>Sample PICO</th>
<th>Eligibility criteria</th>
</tr>
</thead>
</table>
| **P**: Adults with acute pancreatitis | • Adults > 18 years of age  
  • Hospitalized with mild, moderate or severe acute pancreatitis |
| **I**: Early feeding | • Enteral nutrition can be described as oral, nasogastric or post-pyloric nasojejunal feeding  
  • Feeding initiated promptly (within 48 hours) without regard for laboratory features. |
| **C**: Delayed feeding (standard procedure) | • Enteral feeding... instituted after a predefined time (>48 hours) or laboratory parameter is met. |
| **O**: Hospital length of stay, healthcare costs, symptoms, clinical outcomes | • Main outcome(s): Length of hospital stay, readmissions and mortality  
  • Secondary outcomes may include, but are not limited to, the following:  
    1. Time to feeding. This is defined as the time from hospitalization to tolerance of oral feeding.  
    2. Gastrointestinal symptoms. This must be defined by the authors and may include nausea, vomiting, transitional (or worsening) abdominal distention, or transitional (or worsening) abdominal pain.... |
Screening in Rayyan

Rayyan GalterGuide

Rayyan is not supported by Galter Library or NU
Step 4 – Charting/Extracting the Data

- Data extraction process
- No standardized chart or form
  - [Data Extraction Form adapted from the Cochrane Collaboration](Opens to a PDF)
- Forms should be individualized
- Pilot the form
- Refine as needed

<table>
<thead>
<tr>
<th>JBI template source of evidence details, characteristics and results extraction instrument [scoping reviews]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scoping Review Details</strong></td>
</tr>
<tr>
<td>Scoping Review title:</td>
</tr>
<tr>
<td>Review objective/s:</td>
</tr>
<tr>
<td>Review question/s:</td>
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<tr>
<td><strong>Inclusion/Exclusion Criteria</strong></td>
</tr>
<tr>
<td>Population</td>
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<tr>
<td>Concept</td>
</tr>
<tr>
<td>Context</td>
</tr>
<tr>
<td><strong>Types of evidence source</strong></td>
</tr>
<tr>
<td>Evidence source Details and Characteristics</td>
</tr>
<tr>
<td>Citation details (e.g. author/s, date, title, journal, volume, issue, pages)</td>
</tr>
<tr>
<td>Country</td>
</tr>
<tr>
<td>Context</td>
</tr>
<tr>
<td>Participants (details e.g. age/sex and number)</td>
</tr>
<tr>
<td><strong>Details/Results extracted from source of evidence (in relation to the concept of the scoping review)</strong></td>
</tr>
<tr>
<td>E.g. Quality of Life Domains assessed</td>
</tr>
<tr>
<td>E.g. Number of items in tool</td>
</tr>
<tr>
<td>E.g. details of psychometric validation of tool</td>
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</table>
Risk of Bias Assessment

If done, describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis.

- Risk of bias checklists
  - No standardized form for collection
  - The Cochrane Collaboration’s [tool](#) for assessing risk of bias

Step 5 – Collate, Summarize, and Report Results

Synthesize the data extracted during the charting process to present an overview of the literature

What to include:

• Report extracted data and analyses
  • Data that align with the objective(s)
  • Data that address research questions(s)
  • Includes the PCC or PICO elements

• Confidence in cumulative estimate report [systematic reviews]
  • Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach (BMJ Clinical Evidence. (2015). What is GRADE?)
Step 5 – Collate, Summarize, and Report Results

Synthesize the data extracted during the charting process to present an overview of the literature

About the searches:
• Search results
• Results of the selection process

About the sources:
• Description of included sources with references
• The PCC/PICO may be helpful in guiding the format

Presentation options:
• Descriptive text
• Diagrams
• Tables
  • Table of Included Source of Evidence Characteristics
Step 5 – Collate, Summarize, and Report Results

PRISMA Flow Diagram

Depicts the flow of information through the different phases of a systematic review.

http://www.prisma-statement.org/PRISMAStatement/FlowDiagram
## Step 5 – Collate, Summarize, and Report Results

### Table 1: Characteristics of included interventional studies

Excerpt from: [Post-stroke fatigue: a scoping review](#)

<table>
<thead>
<tr>
<th>Study name</th>
<th>Country</th>
<th>Design</th>
<th>No. of participants</th>
<th>Stroke type</th>
<th>Time after stroke</th>
<th>Interventions</th>
<th>Duration of intervention</th>
<th>Delivered by</th>
<th>Delivery mode</th>
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<tbody>
<tr>
<td>Chen et al., 2016</td>
<td>Taiwan</td>
<td>RCT</td>
<td>41</td>
<td>With CHF</td>
<td>64.95±53.07 D</td>
<td>Inspiratory Muscle Training + TAU v. TAU</td>
<td>10 W (5 D/W)</td>
<td>Respiratory Therapist</td>
<td>NR</td>
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<tr>
<td>Chen et al., 2019</td>
<td>Taiwan</td>
<td>RCT</td>
<td>72</td>
<td>Ischemic</td>
<td>NR</td>
<td>Mind-Body Exercise (Qigong) + TAU v. TAU</td>
<td>10 D</td>
<td>Researchers</td>
<td>Individual</td>
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<tr>
<td>Delva 2019</td>
<td>Ukraine</td>
<td>CCT</td>
<td>39</td>
<td>Ischemic/TIA</td>
<td>≥3 M</td>
<td>Acetylsalicylic Acid (Low Dose v. High Dose)</td>
<td>3 M</td>
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# PRISMA 2020 [Systematic Reviews]

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<thead>
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</thead>
<tbody>
<tr>
<td>Abstract</td>
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<tr>
<td>Introduction</td>
<td>3</td>
<td>Rationale</td>
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<td>4</td>
<td>Objectives</td>
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<td>Methods</td>
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<td>Eligibility criteria</td>
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<td>Information sources</td>
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<td></td>
<td>7</td>
<td>Search strategy</td>
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<td></td>
<td>8</td>
<td>Selection process</td>
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<td>Data collection process</td>
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<td></td>
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<td>Data items</td>
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<td></td>
<td>11</td>
<td>Study risk of bias assessment</td>
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<td>Effect measures</td>
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<td>Reporting bias assessment</td>
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<td>Certainty assessment</td>
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<td>Other Information</td>
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<td>Registration and protocol</td>
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<td>Support</td>
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<td></td>
<td>26</td>
<td>Competing interests</td>
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<tr>
<td></td>
<td>27</td>
<td>Availability of data, code and other materials</td>
</tr>
</tbody>
</table>
PRISMA for Scoping Reviews (PRISMA-ScR)

- 22-item checklist
- Captures key elements of a scoping review
- Use to develop a protocol
  - Report Items 1, 3-13

See the [statement paper](#) and [tip sheets](#) for descriptions and examples of each item.

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<td>Eligibility criteria</td>
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<td>Information sources</td>
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<td>8</td>
<td>Search</td>
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<td></td>
<td>9</td>
<td>Selection of sources of evidence</td>
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<tr>
<td></td>
<td>10</td>
<td>Data charting process</td>
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<td></td>
<td>11</td>
<td>Data items</td>
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<td></td>
<td>12</td>
<td>Critical appraisal of individual sources of evidence (if appropriate)</td>
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<td></td>
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<td>Synthesis of results</td>
</tr>
<tr>
<td>Results</td>
<td>14</td>
<td>Selection of sources of evidence</td>
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<tr>
<td></td>
<td>15</td>
<td>Characteristics of sources of evidence</td>
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<tr>
<td></td>
<td>16</td>
<td>Critical appraisal within sources of evidence</td>
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<td>Results of individual sources of evidence</td>
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<td>Synthesis of results</td>
</tr>
<tr>
<td>Discussion</td>
<td>19</td>
<td>Summary of evidence</td>
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<tr>
<td></td>
<td>20</td>
<td>Limitations</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>Conclusions</td>
</tr>
<tr>
<td>Funding</td>
<td>22</td>
<td>Funding</td>
</tr>
</tbody>
</table>
Registering Your Protocol

Why register?
• Transparency
• “Claim” your topic
• Prevent competing reviews
• Item on the PRISMA checklists

Places to register includes:
• Northwestern’s DigitalHub
• PROSPERO
• Open Science Framework
• Systematic Reviews
• BMJ Open
• JBI Evidence Synthesis

Note: PROSPERO does not accept protocols for scoping review
Steps in the Process and Library Support

Librarian as co-author/full-collaboration model

As co-author, your librarian can assist your review team with many tasks in the process.

1. formulate review question
   - Decide on the research question of the review.

2. find previous SR
   - Search for SR that answers the same question.

3. write the protocol
   - Provide an objective, reproducible, sound methodology for peer review.

4. devise search strategy
   - Decide on databases and keywords to find all relevant trials.

5. search
   - Aim to find all relevant citations even if many irrelevant ones included.

6. de-duplicate
   - Remove identical citations.

7. screen abstracts
   - Based on titles and abstracts, remove definitely-irrelevant trials.

8. obtain full text
   - Download, request copies from authors, inter-library loans, etc.

9. screen full text
   - Exclude irrelevant trials.

10. snowball
    - Follow citations from included trials to find additional trials.

11. extract data
    - Extract outcome numbers and associate with trial arm.

12. synthesize data
    - Convert extracted data to common representation (usually average and SD).

13. re-check literature
    - Repeat the search to find new literature published since the initial search.

14. meta analyze
    - Statistically combine the results from all included trials.

15. write up review
    - Produce and publish the final report.

12.5. quality assessment
   - Assess the overall body of evidence.
References


• **BMJ Clinical Evidence. (2015). What is GRADE?**


• Booth, A., Noyes, J., Flemming, K., Moore, G., Tunçalp, Ö., & Shakibazadeh, E. (2019). Formulating questions to explore complex interventions within qualitative evidence synthesis. BMJ global health, 4 (Suppl 1) [See online supplementary file 1 for 38 question formulation frameworks].


Thank You
Questions?