Literature search in rapid reviews

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Trusted evidence.
Informed decisions.
Better health.
Aims of this session

• Considerations and recommendations on planning and conducting systematic searches for rapid reviews,
• Examples, useful software and tools
Survey

• What role do you fill at your organisation?

• What is your experience with rapid reviews?
Cochrane Rapid Review

Definition:

‘A type of evidence synthesis that brings together and summarises information from different research studies to produce evidence for people such as the public, healthcare providers, researchers, policymakers, and funders in a systematic, resource-efficient manner. This is done by speeding up the ways we plan, do and/or share the results of conventional structured (systematic) reviews, by simplifying or omitting a variety of methods that should be clearly defined by the authors.’
Rapid Review searches

abbreviate or limit the systematic literature search in some way to accelerate review production.

**Two options:**

- Reducing time spent on conducting searches
- Reducing the size of the search result
Original and updated Cochrane RR Methods guidance:


Rapid reviews methods series:

Cochrane RR Interim Methods Guidance

- Interim guidance informed by:
  - A scoping review of the underlying evidence
  - Primary methods studies conducted
  - A survey sent to 119 representatives from 20 Cochrane entities, who were asked to rate and rank RR methods across stages of review conduct
  - Discussions among RR methods experts

- Resulted in 26 RR methods recommendations for which there was a high or moderate level of agreement or scored highest in the absence of such agreement

- Fast forward (4-years) and post-COVID (cited >300 times), recognize need for continuous improvement in RR methodologies
Updated Cochrane RR Methods Guidance

- Builds upon the previously published interim guidance (foundation)
- Comprehensive literature scan to identify relevant publications related to RR methodology
- Incorporates findings from a formal evaluation that looked into aspects of adherence, comprehensibility, usability, and usefulness
  • Involved analysis of 128 RR (17 Cochrane and 111 non-Cochrane) and in-depth qualitative interviews with 20 authors
  • Critical insights into areas needing rewording or clarification for certain recommendations; message that the guidance needs to be clearer and more actionable while keeping in mind a diverse range of users, including those with varying levels of experience in systematic and RR methodologies
- Collaborated with a broader group of RR methodologists, led by the Cochrane RRMG, so modifications were well-informed and collectively endorsed
  • Resulted in the publication of a multi-part series in BMJ Evidence-Based Medicine – takes an in-depth exploration of various methodological decisions throughout the RR process
Updated Cochrane RR Methods Guidance

• Refined list of **23 recommendations**, with supporting examples, and provides best practice considerations and practical tips for RR teams to increase efficiencies

• **Key Considerations:**

  • RRs may follow **various methodological paths**; tailored based on time, resources, restrictions, and evidence (not a ‘one size fits’ all approach)
  
  • **Not all recommended restricted methods must be followed**; stricter methods can be used if feasible
  
  • Cochrane RRs should be **driven by the need for timely evidence for decision-making purposes**, including addressing urgent and emergent health issues and questions deemed high priority
  
  • RR **timelines will vary and depend several factors** (e.g., complexity of the topic, urgency of the decision-maker to meet a timeline, which are often short) (Cochrane RRs ≤ 6 months)
  
  • Despite the term “rapid” in it, **time is not the sole defining feature** of RRs (restricted SR methods used)

  • Guidance focuses on questions related to **RRs of health intervention effectiveness**
  
  • May be **adaptable for non-Cochrane RRs of effectiveness**; not yet extended to other RR question types due to unique challenges
  
  • RR author teams should consist of **individuals with expertise** in information retrieval, clinical knowledge, and SR methods
  
  • Teams should have **access to essential resources** before starting a RR including relevant electronic databases (e.g., MEDLINE, CENTRAL, CINAHL), reference management software, screening tools (e.g., Rayyan, Covidence), virtual meeting platforms, and communication tools (e.g., Slack)
Recommendation 4: Involve an information specialist to develop the search strategy, and to consider search methods, resources, and search limits

Recommendation 5: Select a small number (but at least 2) bibliographic databases that are likely to retrieve relevant literature

Recommendation 6: Use the PRESS checklist to peer review the primary search strategy

Recommendation 7: Assess the need for grey literature and supplemental searching. Justify the sources to be searched
Survey

• If you are not an information specialist, do you have access to information specialist/librarian support for your (rapid) reviews?
Searching

Recommendation 4: Involve an information specialist to develop the search strategy, and to consider search methods, resources, and search limits

- Planning the search is part of the RR protocol
- At minimum: consult information specialist (e.g. librarian) for selecting information sources and providing feedback on the primary search strategy
- Perform preliminary searches during topic refinement to help inform eligibility criteria
Recommendation 5: Select a small number (but at least 2) bibliographic databases that are likely to retrieve relevant literature

- For RRs focused on RCTs only: choose 2 of those: MEDLINE, Embase; or MEDLINE combined with e.g. study register, similar articles via PubMed, etc.

- For RR including non-randomized studies: MEDLINE and specialized databases (e.g. CINAHL, PsycInfo, ERIC)
Searching

**Recommendation 6**: Use the PRESS checklist to peer review the primary search strategy

- at minimum: double check for typographical errors, missed keywords, and overall structure

http://dx.doi.org/10.1016/j.jclinepi.2016.01.021
Recommendation 7: Assess the need for grey literature and supplemental searching. Justify the sources to be searched

- Limit to a minimum (e.g. trial registries, review SR bibliographies, reference list checking of included studies)
- Extent depends on the RR topic
Rapid reviews methods series: Guidance on literature search

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Search Recommendations

RR methods series: Guidance on literature search

- Part of an article series on behalf of the Cochrane Rapid Reviews Methods Group
- Recommendations derive from current systematic search guidance, evidence on modified search methods and practical experience conducting RRs.

- **Context:** Compatibility with overall RRMG guidance, but applicable to most RRs
- **Goal:** No one-size-fits all approach, facilitate choice of appropriate methods and understanding of limitations of modified search methods
- **Target audience:** rapid review authors, information specialists/librarians
Recommendations

16 recommendations in 5 areas, covering the whole search process

- Preparation and planning
- Information sources and search methods
- Search strategies
- Quality assurance and search strategy peer review
- Reporting and record management

⇒ Some recommendations are unchanged compared to full systematic reviews
⇒ Appendix with examples and practical considerations
**Preparation and planning**

### Recommendation for RRs

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Different form SR guidance?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involve an information specialist (eg, librarian)</td>
<td>No</td>
</tr>
<tr>
<td>Use prepared templates for planning and conducting the search</td>
<td>Maybe</td>
</tr>
<tr>
<td>Conduct scoping searches, identify a first set of potentially relevant literature</td>
<td>No</td>
</tr>
</tbody>
</table>

**Preparation is crucial:** Time can be saved by involvement of expert searchers, use of templates and standards, and scoping.
## Information sources and search methods

<table>
<thead>
<tr>
<th>Recommendation for RRs</th>
<th>Different form SR guidance?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select a small number (at least 2) of highly relevant information sources</td>
<td>Yes</td>
</tr>
<tr>
<td>Recommendations for finding RCTs</td>
<td>Yes</td>
</tr>
<tr>
<td>Assess if grey literature may be relevant for the topic</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Opportunities for „shortcuts“/restricted methods:** Choose only highly relevant sources & methods
Example: Templates, preliminary searching, choice of information sources

Limits of standardised search processes

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Informed decisions.
Better health.
On-demand rapid reviews (RRs) for hospital doctors in Lower Austria

- **Focus**: precise questions about clinical treatments
- **Standard „shortcuts“**:  
  - Few databases: Ovid MEDLINE, Cochrane Library, Epistemonikos.org  
  - Study designs: Systematic Reviews, Randomized Controlled Trials, (non randomized controlled studies)  
  - Only published literature
- **Templates** for question intake, search assignment, search strategy draft, documentation & reporting
Request: Rapid evidence inventory

Question:
What standardized (validated) instruments exist to evaluate sociability in psychiatric populations?

Standard „shortcuts“:
- Ovid MEDLINE, Cochrane Library, Epistemonikos.org
- Systematic Reviews, Randomized Controlled Trials, (non-randomized controlled studies)
- Only published literature

First step:
preliminary/scoping searches
Preliminary searching

• Conducted during the protocol phase to inform the further review process: topic refinement, identification of systematic reviews and potentially relevant primary studies, estimation of resources to perform the RR.

• Iterative: search for systematic reviews → highly precise searches to find few promising primary studies → citation-based searching

Examples: sources for electronic exploratory citation-based searching

- PubMed Similar Articles: https://pubmed.ncbi.nlm.nih.gov/help/#similar-articles
- Google Scholar (https://scholar.google.com/): cited by, related articles
- Connected Papers (https://www.connectedpapers.com/): citation-networks based on co-cited references & co-citing references
Request: Rapid evidence inventory

Question:

*What standardized (validated) instruments exist to evaluate sociability in psychiatric populations?*

Adapted search process:

- Databases for psychiatric tools: PSYNDEx Tests, APA PsycTests
- APA PsycInfo (Ebsco)
- Ovid MEDLINE: precision-focused search
- No limit to study designs or document types

RRs should use the most relevant information sources for the topic
## Search strategies

<table>
<thead>
<tr>
<th>Recommendation for RRs</th>
<th>Different form SR guidance?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use known relevant records for appropriate search terms</td>
<td>Sort of</td>
</tr>
<tr>
<td>Identify reusable search strategies/elements of search strategies</td>
<td>Sort of</td>
</tr>
<tr>
<td>Use limits and restrictions carefully</td>
<td>Sort of</td>
</tr>
<tr>
<td>When updating an existing review, assess the original search methods</td>
<td>No</td>
</tr>
</tbody>
</table>

**Opportunities to reduce the search result:** RR search strategies may focus on increasing search precision
Quality assurance and search strategy peer review

<table>
<thead>
<tr>
<th>Recommendation for RR</th>
<th>Different form SR guidance?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test if known relevant records are retrieved</td>
<td>Sort of</td>
</tr>
<tr>
<td>Review the primary search strategy</td>
<td>Sort of</td>
</tr>
<tr>
<td>Review the planned information sources and search methods</td>
<td>No</td>
</tr>
</tbody>
</table>

**Quality assurance is crucial:** Inappropriate sources/methods and errors have a greater impact in searches precision-focussed searches

Example:
Text analysis, improving precision, testing sensitivity

The many uses of known relevant records

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Sensitivity (Recall) & Precision

Systematic searches:
Goal: high sensitivity → Low precision

RR systematic searches:
may try to increase precision and accept (small) loss in sensitivity

How many retrieved items are relevant?
How many relevant items are retrieved?

Precision = \( \frac{\text{true positives}}{\text{true positives} + \text{false positives}} \)

Sensitivity/Recall = \( \frac{\text{true positives}}{\text{true positives} + \text{false negatives}} \)

CC BY-SA 4.0 Walber https://en.wikipedia.org/wiki/Precision_and_recall#/media/File:Precisionrecall.svg
Sensitivity (Recall) & Precision

Systematic searches:
Goal: high sensitivity → Low precision

RR systematic searches:
may try to increase precision and accept (small) loss in sensitivity

CC BY-SA 4.0 Walber https://en.wikipedia.org/wiki/Precision_and_recall#/media/File:Precisionrecall.svg
Request: Rapid Review

Question:

What is the effect of oral contraceptives on the exercise performance of adult women?

Found by initial preliminary search:


SRs can be further used in search development:

• Evaluation for re-use of search strategies
• Included studies as known relevant records
**Text analysis for identification of search terms**

Based on potentially relevant records found during preliminary searching

Examples of free tools:

- PubMed PubReMiner: [http://hgserver2.amc.nl/cgi-bin/miner/miner2.cgi](http://hgserver2.amc.nl/cgi-bin/miner/miner2.cgi)
  ⇒ Pubmed/Medline, word-frequency of single terms & Mesh

  ⇒ Any RIS-file, weighted word frequency of single terms and phrases

- searchbuildR: [https://github.com/IQWiG/searchbuildR](https://github.com/IQWiG/searchbuildR) (Download, R-Package with Shiny App)
  ⇒ Any RIS-file but focus on Medline: identification overrepresented terms compared to random PubMed sample
Sensitivity/Precision

- Categories of search terms based on relevance
- Known relevants to test impact of adding/removing search terms

⇒ Example: Using only definites & probables finds 24/26 known relevants, but has a much smaller search result than using all potentially relevant search terms

<table>
<thead>
<tr>
<th>#</th>
<th>Searches</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>exp Contraceptives, Oral/ (oral adj [contraceptiv* or estradiol or progesterin or progastogen or progesterone]).ti,ab,kf.</td>
<td>51105</td>
</tr>
<tr>
<td>2</td>
<td>1 or 2</td>
<td>27279</td>
</tr>
<tr>
<td>4</td>
<td>exp Athletic Performance/</td>
<td>59604</td>
</tr>
<tr>
<td>5</td>
<td>exp Physical Endurance/</td>
<td>36115</td>
</tr>
<tr>
<td>6</td>
<td>Exercise Test/</td>
<td>60882</td>
</tr>
<tr>
<td>7</td>
<td>Muscle Strength/</td>
<td>24054</td>
</tr>
<tr>
<td>8</td>
<td>(exercise adj2 [performance or response? or recovery or exhaustion or tolerance or test*]).ti,ab,kf.</td>
<td>57349</td>
</tr>
<tr>
<td>9</td>
<td>(endurance adj1 [physical or performance or test*]).ti,ab,kf.</td>
<td>3974</td>
</tr>
<tr>
<td>10</td>
<td>(fitness adj1 [physical or cardio*]).ti,ab,kf.</td>
<td>18970</td>
</tr>
<tr>
<td>11</td>
<td>or/4-10</td>
<td>176527</td>
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Result 1

<table>
<thead>
<tr>
<th>#</th>
<th>Searches</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>(peak adj4 [performance or output or capacity]).ti,ab,kf.</td>
<td>8172</td>
</tr>
<tr>
<td>14</td>
<td>[(anaerobic or aerobic] adj [capacity or power]).ti,ab,kf.</td>
<td>9049</td>
</tr>
<tr>
<td>15</td>
<td>(vo2peak or vo2max or &quot;vo2peak&quot; or &quot;vo2max&quot;).ti,ab,kf.</td>
<td>12988</td>
</tr>
<tr>
<td>16</td>
<td>((max* or peak) adj2 [muscle action? or force production]).ti,ab,kf.</td>
<td>540</td>
</tr>
<tr>
<td>17</td>
<td>(muscle adj [recovery or strength]).ti,ab,kf.</td>
<td>26673</td>
</tr>
<tr>
<td>18</td>
<td>cardiorespiratory response.ti,ab,kf.</td>
<td>360</td>
</tr>
<tr>
<td>19</td>
<td>or/13-18</td>
<td>53544</td>
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Result 2

<table>
<thead>
<tr>
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<th>Searches</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>(exercise or sport? or physical* activ*).ti,kf.</td>
<td>267</td>
</tr>
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</table>

Result 3

<table>
<thead>
<tr>
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<th>Searches</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>(&quot;316366211&quot; or &quot;316366212&quot; or &quot;30167957&quot; or &quot;28906053&quot; or &quot;28497386&quot; or &quot;27898461&quot; or &quot;25694209&quot; or &quot;25519852&quot; or &quot;24504652&quot; or &quot;23956028&quot; or &quot;22948447&quot; or &quot;22446669&quot; or &quot;22403922&quot; or &quot;21848445&quot; or &quot;21395539&quot; or &quot;20227547&quot; or &quot;18054842&quot; or &quot;17990209&quot; or &quot;17157107&quot; or &quot;16595112&quot; or &quot;15598669&quot; or &quot;15618333&quot; or &quot;14707778&quot; or &quot;12706609&quot; or &quot;12381756&quot;).ul.</td>
<td>698</td>
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Found by R1

<table>
<thead>
<tr>
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<tbody>
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<td>27</td>
<td>12 and 26</td>
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Found by R2

<table>
<thead>
<tr>
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<th>Results</th>
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</thead>
<tbody>
<tr>
<td>28</td>
<td>20 and 26</td>
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</table>

Found by R3

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>25 and 26</td>
</tr>
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</table>
## Reporting and record management

<table>
<thead>
<tr>
<th>Recommendation for RRrs</th>
<th>Different form SR guidance?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan the record managing process</td>
<td>No</td>
</tr>
<tr>
<td>Use PRISMA-S to report RR searches</td>
<td>Maybe</td>
</tr>
<tr>
<td>Use reference management software and/or SR platforms</td>
<td>No</td>
</tr>
</tbody>
</table>

**Reporting/Documentation are unchanged:** Time can be saved by involvement of expert searchers and use of templates and standards.

Free tools and templates for documentation, record management, etc.

**Tools for the entire search process:** IEBH Systematic Review Accelerator: [https://sr-accelerator.com/#/](https://sr-accelerator.com/#/)

➤ Includes tools for text analysis, PubMed search strategy refinement, search strategy translation, deduplication of search results, citation searching, writing methods section


➤ Aimed at librarians/ISs: templates for communication with systematic reviewers and planning search process

**Documentation and peer review process of database searches:** Cochrane Effective Practice and Organisation of Care (EPOC). (2021). “Search audit template excel spreadsheet.“ [https://zenodo.org/record/5106380](https://zenodo.org/record/5106380)

➤ Excel template for planning, designing, documenting database searches

**Planning reviews and searches:** ILIAS Universität Bern: Templates (Concepts Sheet, PRISMA 2020 Flow Chart, PRESS checklist, Review Protocol): [https://ilias.unibe.ch/goto_ilias3_unibe_cat_2297224.html](https://ilias.unibe.ch/goto_ilias3_unibe_cat_2297224.html)

➤ Collection of templates and checklists for the systematic review process, focused on protocol and searching
References


Discussion & questions