Literature search methods for an overview of reviews ('umbrella' reviews or 'review of reviews')

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A simple search?

Searches for systematic reviews can be straightforward

But, if reviewer also wants to ‘back track’ to get the primary studies out of reviews, it can get complicated….

Image: Complexity by Mark Skipper  [https://www.flickr.com/photos/bitterjug/7670055210](https://www.flickr.com/photos/bitterjug/7670055210)  (CC BY 2.0)
Session overview

- Definitions
- Attractions of overviews of systematic reviews
- Search methods for finding SRs – DEMO
- Overview methods unravelling
- Example of CBT reviews
- Search methods for tracking primary studies
- Comparison of search methods for overviews of reviews
• **Cochrane Overviews of reviews** (Cochrane Overviews) are Cochrane reviews designed to compile evidence from multiple systematic reviews of interventions into one accessible and usable document.\(^{(1)}\)

• **Umbrella review** specifically refers to review compiling evidence from multiple reviews into one accessible and usable document. Focuses on broad condition or problem for which there are competing interventions and highlights reviews that address these interventions and their results. \(^{(2)}\)
Overview of reviews terms

CBT examples


- Effective elements of school health promotion across behavioral domains: a systematic **review of reviews**. (BMC Public Health. 9:182, 2009)

- Pharmacological treatment of dementia: a scoping **review of systematic reviews**. (Dement Geriatr Cogn Disord. 36(3-4):211-28, 2013)

Steps for an overview of systematic reviews

Search
- Identify existing systematic review or meta-analyses

Select
- Use pre-determined inclusion criteria
- Quality assess methods e.g. AMSTAR

Synthesize
- Pool final results of systematic reviews?
- Narrative synthesis of final results
Attractions of an overview of reviews??

- Avoids duplicating review work (exhaustive searches, rigorous selection, painstaking data extraction, analysis….)

- Gives a more statistically significant answer (more studies are combined)

- Can reveal gaps where reviews are needed

- Answers a broader question (useful for decision makers). Gives an overview of a wide subject and integrates several interventions e.g. different diet and physical interventions for weight loss.
Finding overviews of systematic reviews
Lunny C et al. 2016 (3)

MEDLINE Sensitivity-and-precision maximizing strategy (83% Sen. 17% Pre)

((overview$ or review or synthesis or summary or Cochrane or analysis) and (reviews or meta-analyses or articles or umbrella)).ti. or “umbrella review”.ab. or (meta-review or metareview).ti,ab.

MEDLINE Sensitivity-maximizing strategy (99% Sen. 4% Pre)

1 ((overview$ or review or synthesis or summary or Cochrane or analysis) and (reviews or meta-analyses or articles or umbrella)).ti. or “umbrella review”.ab. or (meta-review or metareview).ti,ab.

2 (overview$ or reviews) and (systematic or cochrane).ti.

3 (reviews adj2 meta).ab.

4 (reviews adj2 (published or quality or included or summar$)).ab.

5 “cochrane reviews”.ab.

6 (evidence and (reviews or meta-analyses)).ti.

7 or/2-6

8 1 or 7
Finding systematic reviews

- **SR Database e.g. Cochrane Library**
- **Topic only search: CBT**
- **Database with SR filter / limit e.g. PubMed**
  - CBT + Systematic Review limit
- **Database with no SR filter / limit e.g. Medline HDAS**
  - CBT + (review search string)
### Systematic Review database sources – a selection

<table>
<thead>
<tr>
<th>Database</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campbell Library (Search example)</td>
<td>Social interventions in crime &amp; justice, education, international development, and social welfare.</td>
</tr>
<tr>
<td>Cochrane Database of Systematic Reviews</td>
<td>Interventions and diagnostic tests in health care</td>
</tr>
<tr>
<td>DARE (CRD)</td>
<td>Health and social care interventions (to March-15)</td>
</tr>
<tr>
<td>Epistemonikos</td>
<td>Health care (multi-lingual)</td>
</tr>
<tr>
<td>Health Systems Evidence</td>
<td>Health systems (governance, finance, service delivery, implementation)</td>
</tr>
<tr>
<td>HTA database (CRD)</td>
<td>Completed and ongoing health technology assessments</td>
</tr>
<tr>
<td>Database of Promoting Health Effectiveness Reviews (ePPI)</td>
<td>Health promotion and public health</td>
</tr>
<tr>
<td>3ie Systematic Reviews</td>
<td>Social and economic interventions in low- and middle- income countries</td>
</tr>
</tbody>
</table>
Databases containing reviews

• ‘Portals’ allow quick filtering to systematic reviews

NHS evidence search

• Choose major databases appropriate to your topic
  – E.g. Medline, Cinahl, PsycInfo
Finding systematic reviews with filters / limits

• Bradley 2010 recommended PubMed search as most up to date & reliable database filter \(^{(4)}\)

• Lack of consistency in performance of filters available in different databases and platforms \(^{(4)}\)

• PubMed filter last updated in 2016 – is this the best?

• Lee E et al. 2012 compared systematic review filters with their own (McMaster health-evidence.ca) – which proved best \(^{(5)}\).

MEDLINE.tw OR systematic review.tw OR meta-analysis.pt OR intervention$.ti

(89.9% sensitivity, 1.4% precision, 71.4 NNR)
PubMed search

- Search as systematic [sb] e.g. cbt AND systematic [sb]
- Or use Article types = Systematic Review

AND

NOT
(letter [pt] OR newspaper article [pt])
Ovid – publication type or clinical query?

Use **Additional Limits** for publication type or clinical queries limits

Ovid Publication Type Systematic Review = PubMed systematic [sb]?
HDAS? – no SR limit, make your own

• Adapt Lee et al.\(^{(5)}\) or PubMed strategies?

MEDLINE.tw
OR
systematic review.tw
OR
meta-analysis.pt
OR
intervention$.ti
Next step
Quality assessment

- AMSTAR. A Measurement Tool to Assess Systematic Reviews
- Index of the Scientific Quality of Research Overviews (ISQRO) (Pre-AMSTAR)
- Quality Assessment Tool for Reviews (Effective Public Health Practice Project)
- Methodology Checklist 1: Systematic Reviews and Meta-Analyses. (The Scottish Intercollegiate Guidelines Network-SIGN)
- CASP Systematic Review Checklist
- PRISMA ??? 😞
Effectiveness of CBT (Cognitive Behavioural Therapy) Example

Lots of research
• 10’s overviews
• 100’s reviews
• 1000’s / 10 000’s trials published.

Looking at specific variant forms of CBT, for different populations, different conditions.

Question remains: For which problems, subgroups and formats is CBT clinically effective?

What conclusions can we safely generalise?
The decision to backtrack to primary studies

- Individual trial data not fully reported in review
  - meta-analysis and detailed sub-group analysis not possible
  - Lack of safety data and selective outcomes reviewed (6)

- Low quality review methods
  - don’t want to propagate errors, but opportunity to re-do analysis with its primary studies

- Double counting (same trial in multiple reviews)

- If reviews results disagree with each other, primary study data helps check why

- But - can be very complex and time consuming (7)
‘New’ searches needed for primary studies?

- If review searches lacked rigour (e.g. ‘best’ CBT overview may have missed 75% relevant literature)*
- Search date ranges
  - assume previous reviews found all studies (despite different searches)
  - Last search is old? 50% are out of date if over 5.5 yrs old (8)
- Terms used
  - e.g. behavior not ‘behaviour’. Missing abbreviations ‘CBT’
- Databases searched
  - only PubMed? only Cochrane? (20% CBT reviews in Hoffman overview were Cochrane)
- Gaps where reviews don’t cover important therapy for overview

*based on comparing in-house targeted search for CBT reviews published in 2010 compared to 2010 reviews listed in Hoffman Overview
Planning an overview that includes primary studies. Questions…

- Existing overviews – what are their limitations?
- Estimate size of search results for reviews, what % relevant?
- Can we limit our overview to Cochrane reviews?
- How can avoid missing relevant evidence?

- How much time/cost to estimate for an Information Specialist to do the searches if we
  - Search for overviews, then extract reviews, then extract trials
  - Search for reviews (Cochrane & non-Cochrane), then extract trials
  - Just search for trials
Primary study data from Cochrane reviews

- If access to Cochrane Archie/Review group, may get batch file of titles, abstracts, data extracted.

- If not part of Cochrane Collaboration – download references one-by-one from web page via CrossRef or WoS links
Getting primary study records (title & abstract) from non-Cochrane reviews

Search for systematic reviews
Select relevant reviews

For each review download title & abstract of all included study citations

In Web of Science? *abstracts!
In Scopus?
Reference list available in e-article?

Check which are included studies
Manually find included studies in paper copy

Find one-by-one in PubMed / Google

Database of Primary Studies
Remove duplicates
Find missing abstracts (Reference Update tool)

Import into EndNote

Remove ‘background references
Keep included studies

Import citations in bulk into EndNote

Records ready for use!
Considerations

• Included studies are a sub-section of those in the bibliography. Lots of cross checking needed with included study tables

• Some reviews report included studies bibliography in a separate file

• Some reference records are incorrect and untraceable

• Ideally want to download abstract with the reference as it will be screened later
Download Abstracts! 😊

Check records that don’t import – search for these separately
- Success for 80% of refs in 3 overviews, 86.5% of 4 reviews.
- Finding last15-20% takes long time 😞
Scopus may have electronic records of some studies that WoS didn’t.

Check, check, check that the references you download refer to the included references in the review.
Meta-analysis Comparing Different Behavioral Treatments for Late-Life Anxiety

Steven R. Thorp, Ph.D., Catherine R. Ayers, Ph.D., Roberto Nunez, Ph.D., Jill A. Stoddard, Ph.D., John T. Sorrell, Ph.D., and Julie Loebach Wetherell, Ph.D.

Steps:

1. Check which refs are included studies
2. Go to PubMed links
3. Save citation to clipboard
4. Import to EndNote in bulk

References


Comparing search costings – CBT example

Reviews & backtracking search

Search
• 5 databases, ~5500 review records
• 5 days IS

Screen
• ~100 Cochrane & ~2060 eligible non-Cochrane CBT reviews
• Reviewer Time? (some full text screening needed)

Download review citations
• Cochrane studies download (Archie). 2 days IS?
• non-Cochrane reviews. 183 days IS*

10 months IS
~5000 trials to screen

Primary search + overviews backtracking

Search
• 5 databases, 10 000 + trials records, 70 overviews
• 2 weeks IS

Screen
• Reviewer Time?
• Automated screening?
• # Trials?
• 15 eligible overviews
• Further screen ~400 reviews from 15 overviews

Download overview & review citations
• Cochrane studies download (Archie). 2 days IS?
• non-Cochrane reviews. 38 days IS*

2.5 months IS
12 000 ? trials to screen

*based on 40 mins per review and ave. 11.1 trials per CBT review (duplicates & non-trials removed)
Questions ??

• How serious are the methodological concerns of overviews?
• Should primary studies be sought? Pieper et al 2012 reported 5% overviews searches for primary studies \(^{(8)}\)
• Are searches in overviews being fully reported?
  – How common is it to go back to primary studies in reviews?
  – How common are supplementary searches for recent/ongoing data?
• How reliable/unreliable are reference lists in e journals & databases?
• At what point is it more efficient to search for primary studies and treat is as new, large, complex review rather than track included studies back through their reviews?
Summary

• Many overviews of systematic reviews use the results of systematic reviews only in their analysis
• Searches are straightforward using SR databases, and SR search filters
• Search beyond Cochrane CDSR for wider set of reviews
• But, re-use of SRs to gain efficiency is not a foregone conclusion (9)
• Backtracking from SRs to their primary studies could be effective where number SRs and number of their included studies is small.
• Proceed with caution and prior-testing
References

1. Chapter 22: Overviews of reviews Authors: Lorne A Becker and Andrew D Oxman
3. Lunny C, McKenzie JE, McDonald S. Retrieval of overviews of systematic reviews in MEDLINE was improved by the development of an objectively derived and validated search strategy. Journal of clinical epidemiology. 2015 Dec 23.

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