EPPI-Centre Evidence Tools, Products, and Projects

A series of webisodes from the Evidence for Policy and Practice Information and Co-ordinating (EPPI) Centre

Hosted by AIR’s Center on Knowledge Translation for Disability and Rehabilitation Research (KTDRR)
EPPI-Centre tools for collecting and using data

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Outline

• Data throughout the lifecycle of a review
• Data at specific stages of the review
  – Identifying and selecting studies
  – Capturing data about studies
  – Synthesising study findings
• Further ahead: what tools will be available in the future?
  – Automation technologies
The common stages of a systematic review

1. Form review team (involve ‘users’)
2. Formulate review question, conceptual framework and inclusion criteria (develop ‘protocol’)
3. Search for and identify relevant studies
4. Describe studies
5. Appraise included studies
6. Synthesise and appraise findings
7. Communicate and engage

Map

Synthesis
COLLECTING DATA
Searching

• Many resources for searching, e.g.
  – Bibliographic databases
  – Citation ‘trails’

• Important to keep track of all potentially relevant records
Recording each search that is run
Standardised code sets

This screen allows you to select single CodeSets to import into your review. You can select a CodeSet from the list below and see it displayed in the centre column. The CodeSets that are already in your review are displayed in the third column.

Available CodeSets:
- Screen on Title & Abstract
- Screen on Full Text
- Retrieval status
- Allocations
- Risk Of Bias (Cochrane)
- Data extraction (Home Office review guidelines)
- Screening
- Allocations and Admin
- Data Extraction
- NICE Quality appraisal checklist – qualitative studies
- NICE Quality Appraisal Checklist – quantitative intervention studies
- CASP: 10 questions to help you make sense of qualita
- AMSTAR
- QUADAS 2
- ROBIS: ROB In Systematic Reviews
- Countries
- Screening tool

Copy this CodeSet!

Exit
<- Back

CodeSet Preview (source):
- NICE Quality Appraisal Checklist – quantitative intervention studies
  - Section 1. Population
  - Section 2. Method of allocation to intervention (or comparison)
  - Section 3. Outcomes
    - 3.1 Were outcome measures reliable?
    - 3.2 Were all outcome measurement complete?
    - 3.3 Were all important outcomes assessed?
    - 3.4 Were outcomes relevant?
    - 3.5 Were there similar follow-up times in exposure and corr
    - 3.6 Was follow-up time meaningful?
  - Section 4. Analyses
    - 4.1 Were exposure and comparison groups similar at baseline?
    - 4.2 Was intention to treat (ITT) analysis conducted?
    - 4.3 Was the study sufficiently powered to detect an interve
    - 4.4 Were estimates of effect size given or calculable?
    - 4.5 Were the analytical methods appropriate?
    - 4.6 Was the precision of intervention effects given or calcul
  - Section 5. Summary
  - OVERALL RATING

Codesets in this review:
- Screen on title & abstract
- Screen on full report
- Data extraction tool
- Allocation codes
- Retrieval status
- Report sets

e.g. tool to assess quality of qualitative studies

- EPPI-Centre Health promotion keywording strategy
- Mapping Coding Tool
- Mapping tool allocations
- Surveys n=100
- Jeff 3.1 check
- YP tobacco sources - Data Extraction and QA
  - Data Extraction (All studies)
  - Quality Assessment (Surveys) = QAS
  - Quality Assessment (Qualitative) = QAQ
    - QAQ1. Were steps taken to strengthen rigour in the sampling?
    - QAQ2. Were steps taken to strengthen rigour in the data collected?
    - QAQ3. Were steps taken to strengthen the rigour of the analysis of data?
    - QAQ4. Were the findings of the study grounded in / supported by the data?
    - QAQ5. Please rate the findings of the study in terms of their breadth and depth
    - QAQ6. Privileges YP perspectives/experiences?
    - QAQ7. Reliability
    - QAQ8. - Overall how relevant is the study for this review?
    - QAQ9. Usefulness
- Inductive coding
- Intervention Map
Coding studies

Background
The range of different methods for synthesising qualitative research has been growing over recent years [1,2], alongside an increasing interest in qualitative synthesis to inform health-related policy and practice [3]. While the terms ‘meta-analysis’ (a statistical method to combine the results of primary studies), or sometimes ‘narrative synthesis’, are frequently used to describe how quantitative research is synthesised, far more terms are used to describe the synthesis of qualitative research. This profusion of terms can mask some of the basic similarities in approach that the different methods share, and also lead to some confusion regarding which method is most appropriate in a given situation. This paper does not argue that the various nomenclatures are unnecessary, but rather seeks to draw together and review the full range of methods of synthesis available to assist future reviewers in selecting a method that is fit for their purpose. It also represents an attempt to guide the reader through some of the varied terminology to spring up around qualitative synthesis. Other helpful reviews of synthesis methods have been undertaken in recent years with slightly different foci to this paper. Two recent studies have focused on describing and critiquing methods for the integration of qualitative research with quantitative [4,5] rather than exclusively examining the detail and rationale of methods for the synthesis of qualitative research. Two other significant pieces of work give practical advice for conducting the synthesis of qualitative research, but do not discuss the full range of methods available [6,7]. We begin our Discussion by outlining each method of synthesis in turn, before comparing and contrasting characteristics of these different methods across a range of dimensions. Readers who are more familiar with the synthesis methods described here may
ANALYSING DATA
Mapping research activity

Interactive database of DFID programmes relating to the Strategic Vision for Girls and Women and Empowerment and Accountability

DFID’s theory of change for citizen empowerment and governance:
- Social accountability through increased engagement
- Political accountability through citizen involvement
- Economic empowerment through lowering barriers, etc.

Projects promoting social or political accountability, or both, account for more than 81% of the projects in the evaluation period.

R Code (Metafor):

```r
if ( (!require(metafor)) ) {
  # install.packages("src/metaforMin.zip", lib = ".", repos = NULL, verbose = TRUE)

  library(metafor, lib.loc=".", verbose=TRUE)
}

res <- rma(yi, sei=sei, data=data, measure="OR", slab=studylabels, level=95, digits=4,
  verbose=TRUE, method="VE")

Main_Summary <- capture.output(res)

Fit_Statistics <- capture.output(res)

boxplot(dat$yi)

qqnorm(res)

funnel(res, yaxis='yinv', main='Small Study Effects')

funnel(res, yaxis='sinv', main='Small Study Effects')

funnel(res, yaxis='vi', main='Small Study Effects')

funnel(res, main='Standard Error')

forest(res, transf=exp)

These results are provided by the function above.

```
AUTOMATION IN EPPI-CENTRE TOOLS
Citation screening

- Has received most R&D attention
- Diverse evidence base; difficult to compare evaluations
- ‘semi-automated’ approaches are the most common
- Possible reductions in workload in excess of 30% (and up to 97%)

Summary of conclusions

- Screening prioritisation
  - ‘safe to use’
- Machine as a ‘second screener’
  - Use with care
- Automatic study exclusion
  - Highly promising in many areas, but performance varies significantly depending on the domain of literature being screened

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How the machine learns...

1. Database searches
   Citations entered into database

2. Manual screening
   Initial set of relevant and irrelevant studies is identified from a random sample of citations

3. Machine learning
   Machine is 'trained', learning from the manually screened citations
   List of studies to be screened manually in subsequent step is generated

4. Manual screening
   The list of studies generated in previous step is screened manually
   If the stopping criterion has not yet been reached, the previous step is re-run, incorporating the new screening decisions

5. Screening complete
   Classifier automatically assigns unscreened citations as being included or excluded

And it can work quite well...
Does it work? e.g. reviews from Cochrane Heart Group

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Finding RCTs...

- A machine learning RCT classifier was built using more than 280,000 records from Cochrane Crowd
- 60% of the studies have scores < 0.1
- If we trust the machine, and automatically exclude these citations, we’re left with 99.897% of the RCTs (i.e. we lose 0.1%)
- Is that good enough?
- Systematic review community needs to discuss appropriate uses of automation
Using the classifiers in EPPI-Reviewer
Extraction of data from graphs
Thank you

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