Managing the literature in systematic reviews

Marshall Dozier
What are we talking about?

• What makes a literature review ‘systematic’?

• What’s the difference between a systematic review and meta-analysis?

• There’s plenty of debate about systematic review methods – see reading list
PRISMA 2009 Flow Diagram

Records identified through database searching (n = )

Additional records identified through other sources (n = )

Records after duplicates removed (n = )

Records screened (n = )

Records excluded (n = )

Full-text articles assessed for eligibility (n = )

Full-text articles excluded, with reasons (n = )

Studies included in qualitative synthesis (n = )

Studies included in quantitative synthesis (meta-analysis) (n = )


For more information, visit www.prisma-statement.org.
Topics for this session

• What about avoiding bias?
• Where do you start?
• Your search strategy might include...
• How do you keep track of everything?
• How do you describe your search methods?
• Some detailed techniques...
What about avoiding bias?

• Publication bias – mitigate by using grey literature, looking for unpublished studies usually via research registers and contacting experts.
• Database bias – mitigate by search regional specialist databases like the Global Health Library
• Language bias – avoid limits that aren’t directly linked to inclusion criteria congruent with your research question
• Multiple publication bias – mitigate by noting studies with common authors, equal numbers of participants and common grant numbers.
• Reviewer bias – mitigate by sticking to your clearly stated question and your inclusion/exclusion criteria.
Supporting the principles of the SR

• Minimise bias
  – e.g. search should allow positive and negative findings

• Include all comparable data
  – e.g. include unpublished studies

• Methods are explicit
  – Like a laboratory experiment

• “Reproducible”
  – Record all activities and report explicitly
Where do you start?

Initial scoping search…
- Has a review already been done?
- Informs almost every aspect of the protocol

For the review proper…
- Make a strategic selection of literature databases, organisation websites and expert contacts
- Get ideas for your search terms by looking at prior reviews and known relevant studies
- Develop your search in one core database, then adapt that for other databases

Is the database search good enough?
- Test your search to see if known relevant papers are retrieved
Your search strategy might include...

- Literature databases (like Medline, Web of Science)
- Grey literature (not commercially published)
  - Theses/Dissertations (special databases)
  - Reports (specific web sites, or Google with format limit)
- Key organisations’ websites
- Unpublished studies
  - Search trials registers
- Contact experts in field
- Citation tracking
- Hand-searching
How do you keep track of everything?

• Download database results to work on selection process. If you select directly from database results sets,
  – Results sets change when databases are updated
  – More likely to spend time on duplicate records
• Save your search histories on the database platform if possible, or on local computer files (e.g. word doc) if needed
• Record dates of downloads, and year coverage of search
More

How do you keep track of everything?

• EndNote or similar to de-duplicate results
  – Don’t waste time rejecting the same record more than once!

• EndNote (or similar) can also be used to manage process of selection and feed directly into PRISMA flow diagram
How do you describe your search methods?

• Be transparent in describing your methods
• Give enough detail for someone else to reproduce your methods
• For each database searched, report
  – platform used
  – date of download
  – span of years searched
  – search history
Some detailed techniques...
Formulating the search queries

• PICOS / SPIDER framework as appropriate
• Reverse engineer from ideal data
• Identify synonyms, alternative spellings, related terms
• Link to criteria for relevance
• Not all essential concepts are good search terms – may work better as selection criteria
• Adapt the queries to best suit the resource
PICOS
• Patient/population/problem
• Intervention/exposure
• Comparison/control
• Outcome
• Study design

SPIDER
• Sample
• Phenomenon of Interest
• Design
• Evaluation
• Research type
Reverse engineering...

• What kind(s) of data are appropriate?
• How are those data generated?
  – Instruments
• What types of study designs are valid?
  – Not sure? See e.g. www.cebm.net/index.aspx?o=1039
• Criteria for generalisability
  – e.g. age, sex, co-morbidities, health infrastructure, health policy, cultural requirements
Boolean combining operators

**AND** for the different essential topics

**OR** for synonymous topics

**NOT** to exclude a topic (use with caution!)
Water Purification OR Diarrhea OR Waterborne infection

Could be… Other PICO element e.g. Population Comparison Methodology filter Etc.
Recent advances in educational theory and methodology have made it possible to teach medical interviewing with as much rigor as other clinical skills. We describe a first-semester, first-year medical student course that effectively teaches basic interviewing skills. This course provides faculty development, small group learning, detailed faculty and student coursebooks, and an interview checklist that delineates specific interviewing skills and content areas, serving as a template for teaching, practice, and feedback. Students have many opportunities for practice in role play and with patients, followed by feedback by self, peers, and faculty. Use of audiotape and videotape reviews enhances the learning experience. This article describes our course, suggests educational principles and standards for the teaching of medical interviewing, and presents educational research demonstrating significant gains in students' skills associated with improvement in standardized patient satisfaction.
Testing a systematic search

Check to see if known papers are retrieved by your search. If not, look closely at the database record and adjust your search. *(image from OvidSP Medline)*

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Citation Tracking

Find more recent/additional research in same area

Example ‘starter’ paper:
Cited Reference Search

Find the articles that cite a person's work.

Step 1: Enter information about the cited work. Fields are combined with the Boolean AND operator.

* Note: Entering the title, volume, issue, or page in combination with other fields may reduce the number of cited reference variants found.

Novack D*

Cited Author

Example: J Comp* Appl* Math*

Cited Work

1992

Cited Year(s)

Search

View abbreviation list

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1. **The Group Objective Structured Clinical Experience: Building communication skills in the clinical reasoning context**
   
   By: Konopasek, Lyuba; Kelly, Kevin V.; Bylund, Carma L.; et al.  
   PATIENT EDUCATION AND COUNSELING Volume: 96 Issue: 1  
   Pages: 79-85  
   Published: JUL 2014  
   
   [find@edinburgh](#)  
   [View Abstract](#)

2. **Training Students with Patient Actors Improves Communication: A Pilot Study**
   
   By: Anderson, Heather A.; Young, Jack; Marrelli, Danica; et al.  
   OPTOMETRY AND VISION SCIENCE Volume: 91 Issue: 1  
   Pages: 121-128  
   Published: JAN 2014  
   
   [find@edinburgh](#)  
   [View Abstract](#)

3. **Treating the whole patient: passing time-honoured skills for building doctor-patient relationships on to generations of doctors**
   
   By: Branch, William T., Jr.  
   MEDICAL EDUCATION Volume: 43 Issue: 1  
   Pages: 93-94  
   
   [find@edinburgh](#)  
   [View Abstract](#)
Did you mean: "communication skills" OR "interpersonal skills" "medical students" OR "nursing students" curriculum OR curricula OR curriculum OR "course design"

Teaching communication skills to medical students, a challenge in the curriculum? M Deveugele, A Derese, SD Maeschalck... - Patient Education and ..., 2005 - Elsevier
INTRODUCTION:: As communication skills become more and more important in medical practice, the new medical curriculum at Ghent University (1999) implemented a communication in curriculum. METHOD:: Communication training or experiences in 'real life' ...
Cited by 84 - Related articles - All 12 versions

The influence of the New Pathway curriculum on Harvard medical students GT Moore, SD Block, CB Style, R Mitchell - Academic Medicine, 1994 - nihb.nih.gov
The Influence of the New Pathway Curriculum on Harvard Medical Students GORDON T. MOORE, MD. ... NPIRF), used Likert rat- ing scales to measure five dimensions: communication skills, empathy, use ... 68.21 36 19.12 60.93 15 14.29 -If Observer-rated interpersonal skills w ?c ...
Cited by 190 - Related articles - BL Direct - All 9 versions

Assessing the development of communication skills in undergraduate medical students GM Humphris, S Kaney - Medical education, 2001 - Wiley Online Library
... between knowledge of interaction skills at an early stage of the curriculum and later ... Rating scales have been utilized extensively in the area of assessing interpersonal skills. 26 The use of simulated patients in assessing medical students' communication skills is well accepted. ...
Cited by 61 - Related articles - BL Direct - All 7 versions

Care at the end of life: a novel curriculum module implemented by medical students JW Magnani, MA Minor, JM Aldrich - Academic Medicine, 2002 - journals.lww.com
... The module provides students with opportunities to practice communication skills and to assess their ... Of List 1 shows the six open-ended questions graduating medical students received. We simultaneously reviewed Stanford School of Medicine's preclinical curriculum for content ...
Cited by 27 - Related articles - BL Direct - All 4 versions

Comparing self-reported communication skills of medical students in traditional and integrated
Theory/Jargon 1

- **Boolean Operator** AND, OR and NOT are ‘logical operators’ that search software uses to combine search terms.
- **Controlled index or thesaurus** A controlled thesaurus is a list of standard subject terms from which indexers select subject headings to describe the content of articles or other publications in a consistent manner.
- **Free-text search** A search that will look for a word or phrase in all available fields of the database records, regardless of contextual meaning.
- **Methodology filter** A ‘ready-made’ search of terms that will retrieve specific types of reports, e.g. cohort studies, controlled trials, diagnostic use, etc. Filters are not usually subject specific – they are meant to be applicable to any subject search.
Theory/Jargon 2

- **Sensitivity** When referring to a literature search, means inclusive, so that you get more hits, and may get some irrelevant ones. Synonymous with ‘recall’.
- **Specificity** When referring to a literature search, means exclusive, so that you get fewer hits to sift through, but may miss some relevant information. Synonymous with ‘precision’.
- **Subject heading** A term used to describe the content of a publication – usually derived from a Controlled thesaurus.
- **Truncation** (or wildcard searching) is the substitution of a character to retrieve variations in spelling and word ending. It cannot be utilised with the set terms of a controlled vocabulary, but is a powerful aid in improving the sensitivity of free text searches.