Principles of writing reviews

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What Is a Review?

- Reviews do not present new data but do provide an assessment of what has already been published or presented
- Two standard types of reviews: narrative reviews, also known as traditional or non-systematic reviews; and systematic reviews, which may or may not be followed by a meta-analysis

Narrative review

- Non-systematic summation and analysis of available literature on specific topic
- No acknowledged formal guidelines for writing narrative reviews
- Usually used for topics for which systematic review format is unsuitable or better covered as a narrative review; e.g., historical perspectives, reviews of research involving various animal models and reviews of patient data from routine (uncontrolled) clinical practice are all considered narrative reviews

Systematic reviews

- More rigorous approach to ‘‘reviewing” literature in a well-defined way
- More likely to have considered bias in a methodical way
- Generally considered to represent a better evidence-based source of information than narrative reviews
- Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement has provided well-recognized, standardized guidelines for authors writing systematic reviews since 2009

Narrative versus systematic reviews

Narrative	Systematic
Question: broad (er)	*Question*: specific
Source: not usually specified	*Source*: comprehensive; explicit search approach
Selection: potentially biased	*Selection*: criterion-based; uniformly applied
Evaluation: variable	*Evaluation*: rigorous and critical
Synthesis: often qualitative	*Synthesis*: generally quantitative
Inferences: sometimes evidence-based	*Inferences*: usually evidence-based

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Meta-analysis

- Generally an extension of a systematic review
- Data from several, similar studies on essentially the same subject are combined and analyzed, using standardized statistical techniques
- Helpful when smaller sample sizes can be grouped together for a greater chance of a statistically (and hopefully, clinically) significant result

Overview of reviews

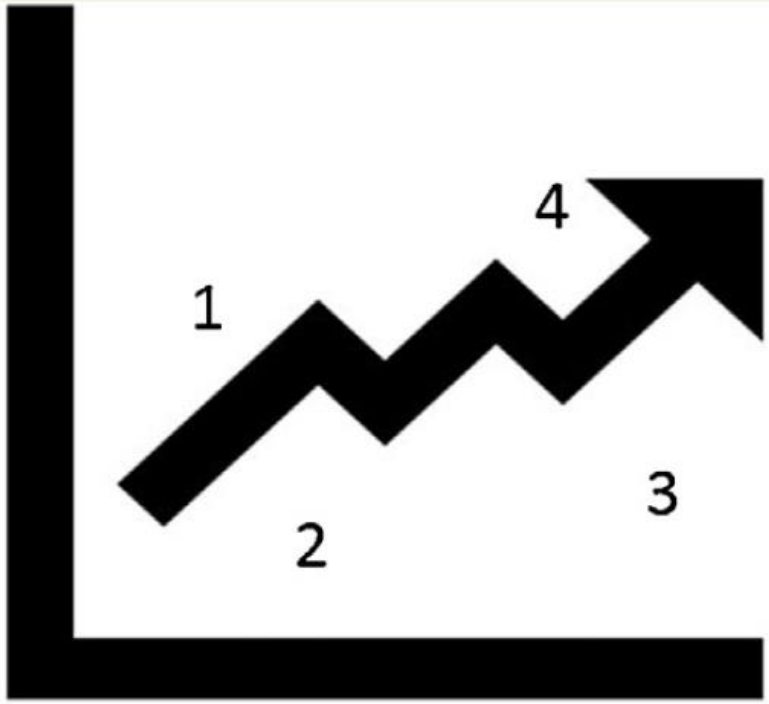
- Historically had narrative reviews, then systematic (evidence-based medicine)
- Currently both types of reviews are done, depending on the circumstances
- For clinicians, efficient way of retrieving condensed and ‘‘filtered” information
- For students, current review is likely more up-to-date than a textbook
- For researchers, can assist in refining a study hypothesis and in identifying pitfalls to avoid in the conduct of trials.
- Critical reviews can yield new insights and justify future research directions
- In general, reduce information overload
- Attract many citations, boost journal impact factors

When and what review is appropriate?

- Need to know literature, both original research and literature reviews
- Much published research, no substantive reviews, review is indicated
- If not much research, may need to identify pertinent original research questions rather than conduct a review.
- Much research and many reviews, perhaps a review of reviews!

Schematic overview

Published Research



Literature Reviews

1. Need for a literature review
2. Need to identify research questions
3. Need for a review to point out need for more research
4. Need for a review of reviews!

* *From Pautasso M. PLOS Comput Biol 2013; 9(7):e1003149.*

Steps in writing a review

- Overall, 5 steps
- First 4 steps are specific for narrative and systematic reviews
- Step 5 is common for both
- Begin with a narrative review

Step 1: Define topic and audience

- Select a topic of contemporary interest to others
- Ensure that there is enough literature, but not overwhelming
- Avoid too broad of a topic; refine it as needed

Step 2: Search and re-search the literature

- Identify the most relevant literature in your selected topic area
- Keyword searches on relevant databases, including PubMed, EMBASE and the Cochrane Database of Systematic Reviews
- Combine keywords with Boolean operators (‘‘AND”, ‘‘OR” and ‘‘NOT”)
- The most recent literature is likely the most relevant (last 5–10 years)
- If you find similar published reviews, may change focus of narrative review
- Be aware of different spellings (e.g., estrogen versus oestrogen)

Databases

On-line Medical Literature Databases — some examples

PubMed	A service of the US National Library of Medicine; indexes journal articles listed in MEDLINE
EMBASE	A biomedical on-line service of the publisher Elsevier; indexes mainly European and non-English literature sources
Cochrane	Database of Systematic Reviews
DARE	Database of Abstracts of and Reviews of Effectiveness
CINAHL	Cumulative Index to Nursing and Allied Health Literature

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Step 3: Be critical

- Avoid just a summary (‘‘reviewing the literature is not stamp collecting”)
- Summarize, analyze, critically discuss, identify methodological problems or knowledge gaps (needs to be novel)
- Make notes, record key words, results, outcomes, thoughts (enable you to retrace your steps)

Step 4: Find a logical structure

- Introduction, body and conclusion
- Structure of body can be thematic, chronological, order of complexity, etc.
- Start with critical information, write point-by-point, paragraph-by-paragraph
- Aim for clarity, avoid ambiguity and lack of order or flow
- Make an outline, create diagrams or figures to communicate information
- Make your points clearly and efficiently
- Abstract, summary of background, review aim, literature search strategy, and key messages are generally written last
- Keywords can help your work to be retrieved and cited

Writing a systematic review?

- Step-wise process is similar to a narrative review
- Generally more ‘‘ordered” from start to finish

Step 1: Frame a research question

- PICO
- – What **Person** or **Patient** does this relate to?
- – What is the relevant **Intervention** or cause?
- – Is there something with which to **Compare** the intervention?
- – What is the **Outcome** of interest?
- Must identify a topic of interest with sufficient literature to review
- Preliminary ‘‘scoping” review can assess available literature
- Avoid a question that yields either too much or not enough data

Step 2: Search and re-search the literature

- Identify relevant literature to be summarized and analyzed, generally via a keyword search on electronic databases ± grey (‘‘unpublished”) literature
- Usually seeking to present a comprehensive and unbiased coverage of highly reliable, updated information
- Usually search **at least** 2 or 3 reliable databases
- Devise a systematic review protocol that specifies study selection criteria *a priori* from the systematic, review question, with stated reasons for inclusion and exclusion, before conducting the literature search(es)
- Protocol includes specifying minimal acceptable study design
- Register your review (e.g., Cochrane Collaboration or The International Prospective Register of Systematic Reviews (PROSPERO)
- Verify no other systemic reviews on your topic are underway

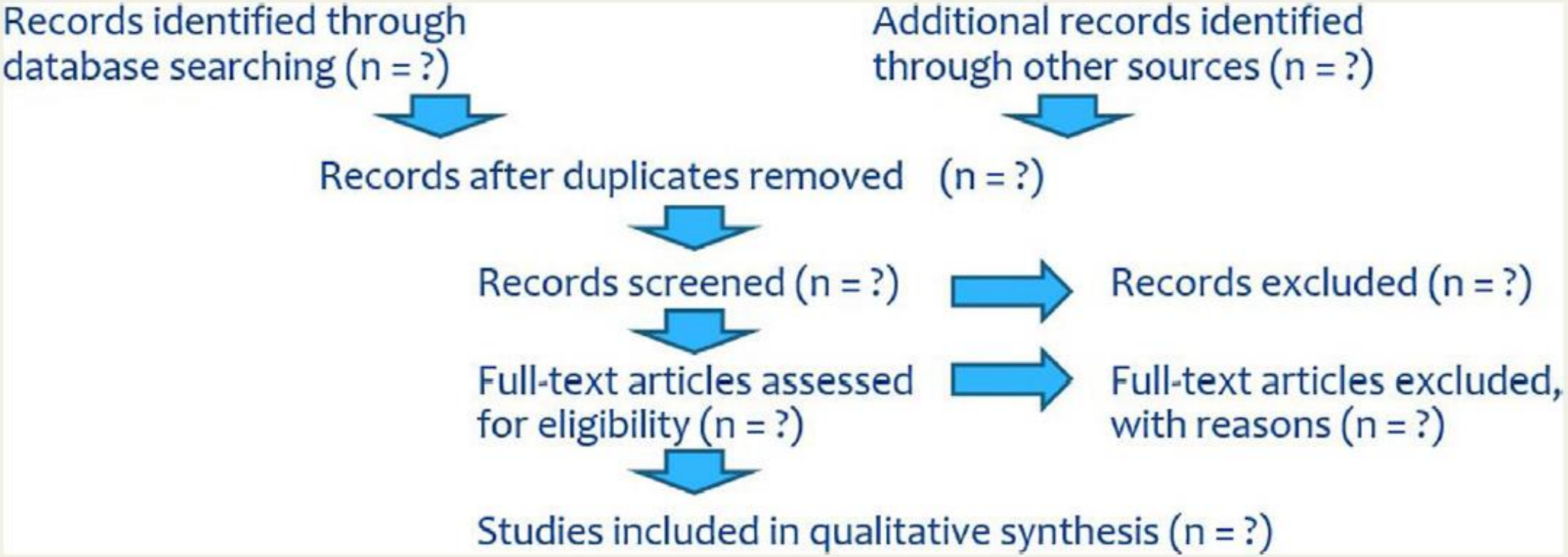
Step 3: Be critical

- Summarize the literature in a critical way, to identify bias, and to make a useful recommendations based on your analysis
- Closely follow the PRISMA Statement guidelines
- Design-based quality checklists and critical appraisal guides can help to work out which identified studies carry more weight in making recommendations or may be suitable for meta-analysis
- Data synthesis involves tabulating study characteristics, study quality and outcomes, and risks of publication and other biases in each study
- Simply summarizing is unlikely to be publishable (lack of novelty)

Step 4: Find a logical structure

- Structure is often simpler than a narrative review; usually IMRAD (Introduction, Methods, Results and Discussion) format.
- **Introduction**: describe the research question
- **Methods**: sufficient detail to replicate (databases, years searched, keywords, inclusion and exclusion criteria)
- **Results**: report information in a logical, organized, logical grouping, e.g., by similar findings or by level of evidence
- **Discussion**: emphasize what your work adds, strengths and limitations
- Use tables, boxes and diagrams (e.g., PRISMA Flow Diagram)
- Ensure everything is in the correct section
- Avoid conclusions not related to included material

PRISMA Flow diagram



PRISMA Flow Diagram [5].

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Step 5: Reviewing your review

- Seek feedback and use it to guide your revision
- Read your review aloud to yourself and others, including a non-expert
- DO NOT submit your manuscript without review and revision

Choosing a title

- Clear titles or those that include ‘‘systematic review” are recommended
- Titles posed as questions can be appropriate
- Titles that convey a specific and accurate description of manuscript content are more likely to be cited

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