Searching the literature for studies for a systematic review. Part 5: Beyond the standard electronic databases

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In the past few issues, we have looked at how to construct a search for the main electronic databases. However, to get a very sensitive search and to combat publication bias, you may need to go further than looking at the standard databases. Searching the gray literature (items that are not published or published in noncommercial form) can be fruitful.[1] Citation searching, handsearching, and web searching may also retrieve articles you may not find elsewhere.[2]

GRAY LITERATURE SEARCHING

Gray literature encompasses a large range of documents including clinical study reports, theses, dissertations, conference abstracts, and others. The Open Grey service provides open access to 700,000 bibliographic records organized by subject area. More than 9,500 records are available for dentistry or related topics. A wealth of theses and dissertations are now available online. Sources include: Proquest dissertations and theses (only available via subscription); Open Access Theses and Dissertations (free to use); the British Library's EThOS database (free to use); and OpenThesis (free to use).

Conference abstracts are indexed on Embase and would be retrieved in a general search there. Web of Science includes a separate database of conference proceedings which can be searched as a stand-alone dataset. Web of Science is a very large database relating to biomedical literature and is available via subscription. The International Association for Dental Research (IADR) has a searchable archive of meeting abstracts, which can be useful in tracking unpublished studies.

Clinical study reports contain regulatory data on drugs, and an editorial at the Cochrane Library by Jeppe Schroll and Lisa Bero concluded that "searching regulatory data from the EMA [European Medicines Agency] and the FDA [U.S. Food and Drug Administration] should be part of any Cochrane Review of drug interventions."[3] This recommendation was based on research showing "that including unpublished data from regulatory agencies changed the results of the original meta-analysis." The EMA and FDA databases both contain these reports. If the drug is newly approved (within the past 5 years) or used for a new indication, these databases should be searched for an intervention review.

CITATION SEARCHING

Citation searching is increasingly important in tracking down relevant studies for systematic reviews. Finding systematic reviews on the same or a similar topic and checking the reference lists for citations can be fruitful, as can checking the reference lists of those studies that will be included in the review. If you retrieve multiple recent papers, common citations between them often highlight the more important papers in the field. The Epistemonikos database is particularly useful for this, because it allows users to search for a topic and retrieves related systematic reviews with links to their references. If there is more than one review, Epistemonikos can generate a matrix, showing the trials that have been included and excluded in each.

Google Scholar and the Scopus database both allow users to look up a known paper on a topic and find out where else it has been cited. This can be useful in identifying later reviews on the same topic, or other studies which might cite the paper. Scopus is available from Elsevier by subscription, and Google Scholar is free to use.

COMMUNICATE WITH AUTHORS AND EXPERTS

If you know of one of the great minds in a particular field, browse the papers published by that scientist. The titles of the papers often can help you find important

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works on the topic. You can also talk to academic faculty to give you a starting point for where to begin (recent papers, a systematic review, or the name of a prominent scientist who has published on that topic). If you come across a paper or study with unpublished results, it can be worth contacting the author(s) to see if they are willing to share any data for the review.

TEXT BOOKS AND HANDSEARCHING

For mature scientific topics, textbooks have been written that present an excellent introduction. Check their references to spot relevant papers or key words for future searches.

Handsearching (searching journals page by page) has been cited by a Cochrane review as being an important supplement to electronic searching.[4] However, the evidence for this is no longer current and may have changed. Many journals are now well indexed on electronic databases. However, if there is a prominent journal in the field or one that is not indexed on MEDLINE or Embase, it may be worth handsearching to find relevant studies. If handsearching is undertaken, the journal title, volumes, and publication years searched should be recorded in the review to make sure that the search is replicable.

WEB SEARCHING

General web searching is used to varying degrees for finding studies.[5] It is very difficult to search the web in a systematic way. For example, Google tends to retrieve millions of hits, which can not be downloaded, so its usefulness as a tool for systematic reviews is limited. Google also operates with the use of algorithms that are tailored to the user, so searches using Google are very difficult to replicate. I might do a search, and you might repeat that search using the same key words and retrieve very different results, depending on where you are in the world and what you have previously searched for. However, if you know of web sites that may contain studies or references that you may be interested in, it is worth searching them.

GENERAL SEARCH TIPS

Seek advice and guidance from an experienced searcher: It is recommended that systematic review authors contact a health care librarian or information specialist to find out what resources are available and for advice on the search strategy.

Searches for a systematic review should go beyond MEDLINE.

A sensitive search is preferred over a precise search to guard against publication and selection bias. Expect to screen hundreds (sometimes thousands) of records for a systematic review.

It might be helpful to get the search strategy peer reviewed by a search specialist. If this is not available to you, the PRESS (Peer Review of Electronic Search Strategies) checklist should be used to ensure that the search strategy is robust and effective.[6] The PRESS checklist was developed by expert searchers, and is a useful tool in identifying search errors and improving the selection of search terms.

RESOURCES

- Open Grey: http://www.opengrey.eu/
- Proquest dissertations and theses: https://www.proquest.com/products-services/dissertations/
- Open Access Theses and Dissertations: https://oatd.org/
- The British Library's EThOS database: https://ethos.bl.uk/
- OpenThesis: http://www.openthesis.org/
- IADR Conference Proceedings: https://iadr.abstractarchives.com/
- European Medicines Agency database: https://www.ema.europa.eu/en/medicines
- Food and Drug Administration database: https://www.fda.gov/drugs/informationondrugs/
- Epistemonikos: https://www.epistemonikos.org/
- Google Scholar: https://scholar.google.com/
- Scopus: https://www.scopus.com/

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