

Systematic searching: Reporting the search

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This presentation highlighted the findings from a review of how search strategies and results are documented and reported in the published literature. By investigating a sample of systematic reviews, single studies, Cochrane reviews, and grey literature reports from the tobacco, alcohol and substance use literature, the presenter reviewed how search strategies and results are reported in narrative form (such as in the methodology section of a report), how the detailed search strategy is reported (such as in an appendix to the report), and standards and best practices for reporting the search strategy. It was expected that the audience would gain an increased understanding of the different methods and ways of documenting and reporting search strategies, learn about the importance of standardization for reporting search strategies and discover tools and resources for learning more about documenting the search strategy and methodology.

Keywords

Literature search; Systematic reviews; Standards; Best practices

After providing a brief introduction to the Canadian Centre on Substance Abuse (CCSA) and acknowledging fellow colleague Chad Dubeau who was not present, an overview of the objectives for the session was given. The objectives were modified slightly from those submitted in the original abstract for the presentation and are as follows:

- To understand why it is important to document the literature search.
 - To learn about standards for documenting the search.
 - To see examples of how the literature search is reported in published studies.
- Key aspects of the search function were then highlighted. A literature search that is

conducted for a systematic review or other review articles should be: comprehensive, organized, relevant, and replicable. It is undertaken in support of the research function – which, in turn, may guide or inform program, practice, policy, and decision-making. Results of a literature search may help to identify gaps in the literature, provide justification for further research, and support evidence-based practices. Standardized documentation should be in place for reporting purposes. It is important to remember that the quality of the search affects the validity of the findings. It is critical that relevant literature be identified in a methodical, orderly, and organized manner. As mentioned by Sheila Lacroix in her presentation, librarians play a key role with their expertise in identifying which database to use for a particular search and in understanding the differences in search functionality for each database. Librarians have knowledge of methods for developing and refining a search (e.g., they know when to use automated vs. manual searching; they know how/when to apply index terms, keywords, and phrase searching).

Reporting on the search in the published article is important for a number of reasons, which include (but are not limited to): helping to support transparency and validity of research findings; providing clarity as to how the search was conducted (especially for more complex searches), allowing for replication; allowing for consistency if a publication is updated; identifying gaps or limitations (which may be used to support research funding proposals); allowing for evaluation of the quality of the search; serving as a starting point for other searches; and offering a learning tool for librarians.

Guidelines

During the search for this paper, several guidelines of interest to librarians and information professionals were discovered. Key among them are the PRISMA and PRISMA-P guidelines and checklists which have been developed specifically for authors

of systematic review articles. Although developed specifically for systematic reviews, both sets of guidelines contain items that address the literature search and could be used as a standard for all literature searches whether or not they are conducted for systematic reviews.

The PRISMA checklist (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) includes 27 items organized around seven sections that provide a brief description of how they are to be captured in a review article. The guidelines provide more detailed descriptions for each section. Of specific interest to those involved in conducting the literature search are items 7. *Information sources* and 8. *Search* (both in the 'Methods' section of the checklist).

The PRISMA-P checklist guides authors preparing a protocol for a planned systematic review. It is important for the librarian or information professional conducting the search to be involved during this phase of a systematic review. This checklist contains 17 items which are based on the PRISMA. Items 9. *Information sources* and 10. *Search strategy* are of specific relevance and require identification of information sources (databases) used, along with dates of coverage and a draft search strategy for at least one of the information sources.

In addition, the PRESS checklist and guidelines, developed by librarians at the Canadian Agency for Drugs and Technology in Health (CADTH), is an open access tool that can be copied and used for non-commercial purposes (with attribution). There are 10 items on the checklist along with a set of guidelines that have been developed for using the checklist. A key benefit of peer reviewing a search strategy is to help ensure that a high quality search of information sources has been conducted. As part of the reporting, it may be a requirement to indicate whether or not a peer review of the search strategy was completed.

Acronym	Description	Source	Hyperlink
PICO	Population – Intervention (or Exposure) – Comparison – Outcomes – method for developing an efficient search strategy – for quantitative research questions in the healthcare field.	Health Evidence and Peel Health	PICO Search Terms Table http://www.healthevidence.org/practice-tools.aspx#PT2
PRESS	Peer Review of Electronic Search Strategies – evidence-based scale for peer review of electronic search strategies.	Canadian Agency for Drugs and Technologies in Health (CADTH)	Report https://www.cadth.ca/sites/default/files/pdf/477_PRESS-Peer-Review-Electronic-Search-Strategies_tr_e.pdf
PRESS EBC	Peer Review of Electronic Search Strategies Evidence Based Checklist - identifies elements to aid in the assessment of electronic database search strategies; recommended for use by librarians undertaking the peer review of search strategies.	Canadian Agency for Drugs and Technologies in Health (CADTH)	Checklist https://www.cadth.ca/sites/default/files/is/Peer_review/CADTH%20Peer%20Review%20Checklist%20for%20Search%20Strategies_e.pdf
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta Analyses – to help authors improve the reporting of systematic reviews and meta-analyses and critical appraisal of published systematic reviews; there is a checklist of 27 items.	PRISMA: Transparent reporting of systematic reviews and meta-analyses	Statement http://www.plosmedicine.org/article/fetchObject.action?uri=info:doi/10.1371/journal.pmed.1000097&representation=PDF Explanation and elaboration http://www.plosmedicine.org/article/fetchObject.action?uri=info:doi/10.1371/journal.pmed.1000100&representation=PDF Checklist http://prisma-statement.org/documents/PRISMA%202009%20checklist.pdf
PRISMA-P	Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocol - guides authors preparing a protocol for a planned systematic review; this is a requirement to register the protocol in the PROSPERO database; includes checklist of 17 items based on the PRISMA.	PRISMA-P Group	Statement http://www.systematicreviewsjournal.com/content/pdf/2046-4053-4-1.pdf Elaboration and explanation http://www.bmj.com/content/bmj/349/bmj.g7647.full.pdf Checklist http://prisma-statement.org/documents/PRISMA-P-checklist.pdf
PROSPERO	International Prospective Register of Systematic Reviews - database of prospectively registered systematic reviews in health and social care	University of York, Centre for Reviews and Dissemination	Database home page http://www.crd.york.ac.uk/prospéro/prospéro.asp
QUOROM	Quality of Reporting of Meta-analyses – predecessor to the PRISMA guidelines	QUORUM Group	Statement (abstract only) http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(99)04149-5.pdf

Table 1. List of acronyms

What to document

Based on the 18 review articles identified, the components of a search have been placed into the six categories described below. Not all published reviews include each

component. Cochrane review articles and Campbell Collaboration review articles tended to have the most comprehensive reporting on the literature search. Each of the six components are described below.

Summary/abstract

This section comprises a very general summary statement about the literature search. An example is a list of databases used to conduct the search, or a general overview of the search methods that were employed. Sometimes, very general search criteria are mentioned.

Methods

The methods section in a published review provides more specific details as to how the search was undertaken including, in narrative form, details about the sources used and the search strategy, how the search strategy was developed, and a general overview of search terms used and how they were adjusted according to each database. The names of the databases used were listed, as well as where the search results were stored (i.e., what software application was used). Often, a reference to an appendix with the detailed search strategy would be referenced. Sometimes, you will see a chart or table of the search strategies or search terms used in this section rather than an appendix.

Also in this section, the search methods that were employed to identify studies are described. Examples include electronic database searching, Internet searching for grey literature, and manual searching (of references, conference proceedings/abstracts or individual journals). The scope of the search outside of electronic databases may include personal communication with experts, authors, other investigators, or organizations – sometimes to identify unpublished or ongoing studies. A list of the web sites searched may also be reported here.

Results

This section indicates the total number of studies identified according to the source. A flow diagram of the search screening process may also be included here. Of interest for the librarian or information professional conducting the search is to review the flow

diagram that would indicate the number of studies excluded from a particular set of results, which could potentially be helpful for conducting follow-up or related searches or for other purposes.

Potential biases/limitations related to the search

Although biases and limitations may also be mentioned specifically related to the studies themselves, if there is a specific bias or limitation related to the search (language or date) it would be included here (or in the methods section). Sometimes biases, limitations, gaps, barriers or disclaimers related to the search may also be reported in the Discussion section of an article.

Appendices

An article may or may not include an appendix of the search strategies. The appendix serves to document the detailed search strategy using a flow chart or table according to each searched database, the date searched or date range, and the platform used.

Acknowledgements

Reports on author contributions, name, or position of who conducted the search are mentioned in this section. If a peer review of the search strategy was completed, it may also be mentioned here.

Highlights

The following points were highlighted as key takeaways for librarians and information professionals involved in literature searching:

- It is important to document your search strategy using consistent methods for transparency, replication and reporting purposes. It is also important to determine from the start the reporting requirements of the authors.
- As a standard practice, include a narrative summary of the search strategy along with the search results submitted to the author.

- Use the PRISMA checklist as a guide to help in creating standards for documenting your search.
- Establish consistent recording and reporting practices within your organization and/or team.
- Manage the search results through their life cycle (capture, organize, use, share, dispose). Determine what information you will keep and how long will you keep it for – until the research has been published, or longer?
- Develop standards within your organization (for consistency in documenting and reporting). Continue to learn and improve practice to become an expert searcher.

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