Evidence Based Library and Information Practice

Commentary

An Evidence Based Checklist for the Peer Review of Electronic Search Strategies (PRESS EBC)

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The quality of literature searches is extremely important, especially for health technology assessments (HTAs) and systematic reviews. High quality searches of information resources are essential components in the efforts towards accuracy and completeness of the evidence base. Ascertaining whether a high quality search has been conducted, however, can be difficult. Factors contributing to search quality include the skills set of the person (or persons) who develop/s the search strategies and conduct/s the searches, and the use of a systematic approach (McGowan & Sampson, 2005). In the past, however, there has been little consistency in and poor quality of reporting of searches, so it is often difficult to evaluate the actual searches that were conducted (Sampson, McGowan, Tetzlaff, Cogo, & Moher, 2008; Sampson & McGowan, 2006).

We received funding from the Canadian Agency for Drugs and Technologies in Health (CADTH) to identify and assess the impact of errors in the elements of electronic search strategies associated with accuracy and completeness of the evidence base and to propose enhancements in the methods used for creating and evaluating search strategies. The project was called **P**eer **R**eview of **E**lectronic **S**earch **S**trategies (PRESS). The research consisted of three main components: a systematic review of the evidence relating to quality issues and errors in electronic search strategies; a web-based survey of expert opinion on the impact of search elements on search results and the importance of these elements in the peer review of electronic search strategies; and a peer review forum to test the procedural aspects of receiving and responding to peer review requests electronically.

The systematic review was used to find out if any existing checklists could be identified, and adapted if necessary, but no validated checklists were found. We then reviewed the information retrieval literature to develop an evidence based set of elements that could be used to evaluate electronic search strategies. This draft set of items was additionally informed by expert opinion and a final set of peer review elements was developed. These peer review elements represent only those aspects of an electronic search strategy that can be demonstrated to reduce precision or recall (sensitivity) of the search if not skillfully executed. These elements, therefore, represent those aspects of the search that should be subjected to peer review.

The full report of the methods and results of this research was published by the Canadian Association for Drugs and Technology in Health (CADTH) (Sampson, McGowan, Lefebvre, Moher, & Grimshaw, 2008). Additionally, a more concise journal article summarizing the findings was published (Sampson et al., 2009).

We presented our findings to groups of librarians at meetings and workshops. It was by the dissemination and interaction with the stakeholders of this work (i.e., expert searchers / librarians) that we realized that to translate this work fully into practice a checklist with concise guidance and an active web-based forum were required. Based on this experience and the findings described above, we developed an evidence based checklist that librarians and other searchers can use to guide and inform the peer review of electronic search strategies. We present this evidence based assessment checklist here (Table 1) with an explanation of each of the elements (Table 2).

We present these two tools for use in accordance with a Creative Commons Attribution - NonCommercial - No Derivative Works 2.5 Canada License (http://creativecommons.org/). We have selected a non-commercial license to place these tools in the public domain, to be used in the spirit of indirect reciprocity or generalized reciprocity (also known as 'pay it forward') (Ohtsuki & Iwasa, 2004; "Pay it Forward", 2009). Rather than directly reciprocating the benefit of receiving peer review of one's own search, one would reciprocate by undertaking conscientious peer review of another search, not necessarily a search by the person who undertook the peer review of your search. While the evidence on peer review is mixed, if most grant applications, or most manuscripts, are peer reviewed by two reviewers, than for each submitted grant application or article, a researcher or author should be willing to undertake two peer reviews of other grant applications or articles in order to sustain the scientific community. Peer review of journal articles and grant applications is often anonymous. We suggest that if peer review of electronic search strategies were not anonymous, it might enhance the reviewer's reputation if done well. Such a gain in reputation should act as positive reinforcement for the reviewer, increasing the likelihood that their future reviews would also be of high quality (Mashima & Takahashi, 2008). Obtaining good quality peer reviews should also strengthen the sense of community among those using the PRESS

forum, by advancing community objectives of achieving the highest possible search quality (Mashima & Takahashi, 2008). We have selected a 'no derivative work' license, as the elements of the checklist are evidence based. We assert that they should be used without amendment or local adaptation. If new evidence is generated, the authors undertake to update the checklist accordingly.

Finding a suitable and willing peer reviewer is an additional challenge for anyone wishing to have their search peer reviewed. We are currently exploring a PRESS Forum where librarians/ expert searchers can submit their own searches for peer review and identify searches from other librarians/expert searchers and peer review them. A prototype forum was developed to define the important elements for an effective, interactive peer review forum. It was premised on the existence of strong community and the values of reciprocity that characterize the library and information profession. The pilot forum presaged the phenomenal rise of web-based social networking and used a programmed database as a back-end. A new PRESS Forum is being developed using newer social networking tools to ensure sustainability.

Table 1
Evidence Based Assessment Form for the Peer Review of Electronic Search Strategies (PRESS EBC)

PRESS EBC Assessment Form

1. Translation of the research question:

❑ Adequate

❑ Adequate with recommendations

❑ Needs revision Provide an explanation or example

_____

_____

2. Boolean and proximity operators:

❑ Adequate

❑ Adequate with recommendations

❑ Needs revision Provide an explanation or example

_____

_____

3. Subject headings:

❑ Adequate

❑ Adequate with recommendations

❑ Needs revision Provide an explanation or example

_____

_____

4. Natural language / free-text:

❑ Adequate

❑ Adequate with recommendations

❑ Needs revision Provide an explanation or example

_____

_____

5. Spelling, syntax and line numbers:

❑ Adequate

❑ Adequate with recommendations

❑ Needs revision Provide an explanation or example

_____

_____

6. Limits and filters:

❑ Adequate

❑ Adequate with recommendations

❑ Needs revision Provide an explanation or example

_____

_____

7. Search strategy adaptations:

❑ Adequate

❑ Adequate with recommendations

❑ Needs revision Provide an explanation or example

_____

_____

Table 2
Elements for the Peer Review of Electronic Search Strategies (PRESS EBC Elements)

Translation of the research question	✓ Has the research question been translated correctly into search concepts (e.g. PICO), i.e. does the search strategy match the research question? ✓ Are the search concepts clear? ✓ Are there 'too many' search concepts? ✓ Are any of the search concepts too narrow or too broad? ✓ Does the search appear to retrieve too many or too few records?
Boolean and proximity operators	✓ Are there any mistakes in the use of Boolean or proximity operators? ✓ Are there any mistakes in the use of nesting with brackets? ✓ If NOT is used, is this likely to result in any unintended exclusions? ✓ Could precision be improved by using proximity operators (e.g. adjacent, near, within) instead of AND. ✓ Is the width of any proximity operators correct?
Subject headings	✓ Are the subject headings relevant? ✓ Are subject headings missing? ✓ Are any subject headings too broad or too narrow? ✓ Are subject headings exploded where necessary and vice versa? ✓ Are sub-headings attached to subject headings? (Floating subheadings may be preferred.) ✓ Are sub-headings used instead of relevant subject headings and vice versa? ✓ Are both subject headings and *natural language terms* (see below) used for each concept? o If there is a reason provided for not doing so, does the reason appear sound?
Natural language (also free-text or text-word)	✓ Does the search miss any spelling variants in free-text? ✓ Does the search miss any synonyms? ✓ Does the search miss truncation or truncate at the wrong point? ✓ If an acronym or abbreviation is used, is the full term also included? ✓ Are apparently irrelevant or excessively broad natural language terms used?
Spelling, syntax and line numbers	✓ Are there any spelling errors? ✓ Are there any errors in system syntax or wrong line numbers?
Limits and filters	✓ Do any of the limits used seem unwarranted? ✓ Are any filters used appropriate for the topic? ✓ Are any potentially helpful limits or filters missing? ✓ Is starring (restrict to focus) used and if so, is there adequate justification for this?
Search strategy adaptations	✓ Does the searcher indicate that the search strategy has been adapted for additional databases and / or interfaces? ✓ Are the adaptations available for review and correct?

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