

ORIGINAL ARTICLE

Abbreviated literature searches were viable alternatives to comprehensive searches: a meta-epidemiological study

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Abstract

Objective: To assess the effects of abbreviated literature searches on evidence syntheses conclusions.

Study design and setting: We randomly selected 60 Cochrane reviews of clinical interventions and repeated literature searches using 14 abbreviated approaches (combinations of MEDLINE, Embase, CENTRAL with and without searches of reference lists). If abbreviated searches missed included studies, we recalculated meta-analyses. Cochrane authors determined whether the new evidence base would change conclusions. We assessed the noninferiority of abbreviated searches allowing for a maximum of 10% changed conclusions.

Results: We conducted 840 abbreviated literature searches. Noninferiority varied based on the definition of “changed conclusion”. When the reduction of the certainty of a conclusion was of concern, all abbreviated searches were inferior. Searching Embase only rendered the greatest proportion of changed conclusions (27%, 95% confidence interval [CI]: 16%–40%); combining MEDLINE, Embase, CENTRAL with searches of references lists the lowest (8%, 95% CI 3%–18%). When falsely reaching an opposite conclusion was of concern, combining one database with another or with searches of reference lists was noninferior to comprehensive searches (2%, 95% CI: 0%–9%).

Conclusion: If decision-makers are willing to accept less certainty and a small risk for opposite conclusions, some abbreviated searches are viable options for rapid evidence syntheses. Decisions demanding high certainty require comprehensive searches. © 2018 Elsevier Inc. All rights reserved.

Keywords: Literature search; Rapid reviews; Systematic reviews; Abbreviated; Limited; Databases

1. Introduction

High-quality systematic reviews are the best option to inform and guide decision-making in health care because they employ high methodological standards in searching, selecting, appraising, and synthesizing primary research. Ensuring methodological rigor, however, is time- and labor-intensive and can result in systematic reviews taking up to 24 months to be completed [1,2]. Such long production times often do not meet the time-sensitive needs of

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What is new?

Key findings

- Abbreviated literature searches are inferior to comprehensive systematic literature searches when decision-makers seek conclusions with the greatest possible certainty.
- If decision-makers are willing to accept less certainty along with a small risk that conclusions may be false, several abbreviated literature searches are noninferior to comprehensive literature searches.
- Combining either a single database with a review of reference lists or combining two separate databases may suffice to reliably determine the direction of conclusions.
- Abbreviated searches are more robust in reviews of pharmacological than nonpharmacological interventions, and in reviews including 10 or more studies.

What this adds to what is known?

- This study is the first to assess the effect of abbreviated literature searches on conclusions of clinical intervention evidence syntheses. It provides comparative information on the validity of 14 different abbreviated search approaches.

What is the implication, what should change now?

- Decisions requiring the greatest possible certainty should be based on comprehensive searches of the literature including specialized literature databases. Investigators conducting rapid reviews need to employ searches of at least two electronic databases or combine a search of a single database with a review of reference lists to ensure that the direction of a conclusion is accurate. Searching only a single electronic database is never a reliable method for any evidence synthesis and should be avoided for rapid reviews.

decision-makers. As a consequence, rapid reviews have become a pragmatic alternative to systematic reviews. They are accelerated knowledge syntheses that make results available to decision-makers in a shorter time frame (within a few weeks to a few months) by streamlining certain methodological aspects of systematic reviews. One potential trade-off of rapid reviews, however, is that they might have less reliable results than systematic reviews. Case studies comparing individual rapid reviews with systematic reviews report mixed results concerning the consistency of conclusions [3–6].

Methodological shortcuts in rapid reviews usually address time-consuming processes such as screening and selection of studies [7,8], data extraction, critical appraisal of the risk of bias, evidence synthesis [9], and literature searches [10]. Abbreviated search approaches as used in rapid reviews are diverse and limit the sources (e.g., the number of electronic databases) or specifications of the search (e.g., publication year, languages, or study types) [7]. For example, searching only the most relevant electronic databases without searches of gray literature, trial registries, and reference lists, substantially reduces the time and effort spent on the search itself and reduces the number of records retrieved. This in turn reduces the time spent on record screening. Usually, abbreviated searches do not detect all relevant studies that a comprehensive literature search would identify [11–15]. The impact of missed studies on the results and conclusions of a systematic review, however, remains unclear. Studies on abbreviated search approaches for reviews on therapeutic interventions concluded that not finding all studies did not markedly change the meta-analysis results [15,16]. A study focusing mainly on observational studies concluded that searching only one electronic database was not sufficient to identify all relevant studies in a research area [17].

These three studies focused mainly on recall and precision of searches and the impact of missed studies on results of meta-analyses but not on the impact on overall conclusions of the evidence syntheses. To date, no sufficiently powered study has investigated, across a range of different clinical topics, the impact of abbreviated literature searches (i.e., limiting the number of sources searched) on the conclusions of evidence syntheses. Therefore, the aim of our study was to assess the effect of various abbreviated search approaches on the overall conclusions of evidence syntheses of clinical interventions. Specifically, our research question was “Do bodies of evidence that are based on abbreviated literature searches lead to different conclusions about benefits and harms of interventions compared with bodies of evidence that are based on comprehensive, systematic literature searches?”

2. Materials and methods

A detailed description of the methods of our study has been published elsewhere [18]. We summarize the most important methodological steps in the following sections.

2.1. Identification of Cochrane reviews

We systematically searched the Cochrane Library from January 2012 to June 2016 using “quality of evidence” OR “summary of findings” as search terms to focus on reviews with summary-of-findings tables. One researcher screened 882 identified reviews in random order and determined the eligibility; a second reviewer verified the inclusions. Disagreements were resolved mutually by both

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