



Are MEDLINE searches sufficient for systematic reviews and meta-analyses of the diagnostic accuracy of depression screening tools? A review of meta-analyses



Danielle B. Rice ^{a,b}, Lorie A. Kloda ^c, Brooke Levis ^{a,d}, Bill Qi ^a, Emily Kingsland ^e, Brett D. Thombs ^{a,b,d,f,g,h,*}

^a Lady Davis Institute for Medical Research, Jewish General Hospital, Montreal, Quebec, Canada

^b Department of Psychology, McGill University, Montreal, Quebec, Canada

^c Library, Concordia University, Montreal, Quebec, Canada

^d Department of Epidemiology, Biostatistics, and Occupational Health, McGill University, Montreal, Quebec, Canada

^e Library, McGill University, Montreal, Canada

^f Department of Medicine, McGill University, Montreal, Quebec, Canada

^g Department of Educational and Counselling Psychology, McGill University, Montreal, Quebec, Canada

^h Department of Psychiatry, McGill University, Montreal, Quebec, Canada

ARTICLE INFO

Article history:

Received 2 April 2016

Received in revised form 31 May 2016

Accepted 4 June 2016

Available online xxxx

Keywords:

Depression screening
Diagnostic test accuracy
Meta-analyses
Search strategies
MEDLINE

ABSTRACT

Objective: Database searches for studies of diagnostic test accuracy are notoriously difficult to filter, highly resource-intensive, and a potential barrier to quality evidence synthesis. We examined published meta-analyses of depression screening tool accuracy to evaluate the (1) proportion of included primary studies found in any online database in the original meta-analyses that were indexed in MEDLINE; (2) the proportion of patients from MEDLINE-indexed studies; and (3) the proportion of depression cases from studies indexed in MEDLINE.

Methods: MEDLINE and PsycINFO were searched from January 1, 2005 through October 31, 2014 for meta-analyses in any language on the accuracy of depression screening tools.

Results: We identified 16 eligible meta-analyses that included 398 primary study citations, which had been identified via an online database in the original meta-analyses, including 257 unique citations and 234 unique patient samples. The 234 unique patient samples included 69,957 total patients and 11,867 depression cases. Of these, 220 samples (94%) were from studies indexed in MEDLINE, including 97% of all patients and 96% of all depression cases. When applying a peer-reviewed search strategy in MEDLINE, 91% of all samples, 96% of patients and 95% of depression cases were retrieved. Results were similar for total and unique citations.

Conclusions: Restricting searches to MEDLINE may capture almost all eligible studies, patients and depression cases. Although not examined in the present study, MEDLINE may not be indexed as quickly as other databases. Thus, MEDLINE searches should be complemented by date-limited searches of other databases for recent citations.

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1. Introduction

Meta-analyses of diagnostic test accuracy (DTA) quantitatively synthesize results of individual diagnostic accuracy studies and provide information about the quality of primary studies [1]. One key component that determines the quality of a meta-analysis is the degree to which database searches are sufficiently comprehensive to ensure that all relevant studies are identified for inclusion [2].

The process of gathering relevant literature and identifying publications that fit inclusion criteria can be time-consuming and costly. Searching for DTA studies is even more complex and resource-intensive

than other study designs, including randomized controlled trials, and may be a barrier to conducting quality systematic reviews and meta-analyses [3]. Thus, finding a balance between having a manageable number of citations from databases to evaluate, while being as complete as possible is an important consideration [1]. Search strategies are typically designed with the goal of finding all available references that can help answer a research question [4]. However, failing to find all studies does not necessarily influence summary estimates meaningfully [1]. A recent study, for instance, reported that restricting searches for DTA studies to only MEDLINE did not influence summary estimates of meta-analyses reviewed [5]. That is, across published meta-analyses, it was the case that there were few eligible studies listed in databases other than MEDLINE, the studies that were listed in non-MEDLINE databases generated similar results to those in MEDLINE, or studies in non-

* Corresponding author.

E-mail address: brett.thombs@mcgill.ca (B.D. Thombs).

MEDLINE databases included samples of too few patients to influence meta-analysis results.

Systematic reviews and meta-analyses of the diagnostic test accuracy of depression screening tools can often involve scrutinizing very large numbers of citations from searched databases [6,7]. No research, however, has evaluated the proportion of studies on depression screening tools that would be identified if only MEDLINE were searched. Thus, the objectives of this study were to evaluate meta-analyses on the diagnostic accuracy of depression screening tools to determine (1) the proportion of included primary studies found in any online database in original meta-analyses that were indexed in MEDLINE; (2) the proportion of patients from primary studies found in any database that were from studies indexed in MEDLINE; and (3) the proportion of cases of depression from primary studies found in any database that were from studies indexed in MEDLINE.

2. Methods

2.1. Identification of meta-analyses on the diagnostic accuracy of depression screening tools

We searched MEDLINE and PsycINFO (both on the OvidSP platform) from January 1, 2005 through October 31, 2014 for meta-analyses in any language on the diagnostic accuracy of depression screening tools. A peer reviewed search strategy originally designed to identify primary studies on the diagnostic accuracy of depression screening tools was used [8], and adapted by a librarian to restrict the results to meta-analyses. The complete search strategy for MEDLINE can be found in Appendix A. The strategy was adapted by the librarian for PsycINFO.

We included publications of meta-analyses, but not systematic reviews without meta-analyses, in order to focus only on relatively commonly used screening tools, which are more likely to be included in systematic reviews with meta-analyses. Eligible publications had to include one or more meta-analyses that: (1) included a documented systematic review of the literature using at least one electronic database; (2) statistically combined results from ≥ 2 primary studies; and (3) reported measures of diagnostic accuracy (e.g., sensitivity, specificity, diagnostic odds ratio) of one or more depression screening tools compared to a reference standard diagnosis of depression based on a clinical interview or validated diagnostic interview. We excluded meta-analyses of only measurement properties other than diagnostic accuracy (e.g., general validity, reliability). Publications that included meta-analyses of diagnostic accuracy and other measurement characteristics were included, but only results related to diagnostic accuracy were extracted. Similarly, publications that included meta-analyses of the diagnostic accuracy of screening tools for depression and for other disorders, such as anxiety disorders, were included, but only results for screening for depression were reviewed.

Search results were initially downloaded into the citation management database RefWorks (RefWorks, RefWorks-COS, Bethesda, MD, USA) and transferred into the systematic review program DistillerSR (Evidence Partners, Ottawa, Canada). DistillerSR was used to identify duplicate citations and to track results of the review process. Two investigators independently reviewed citations for eligibility. If either reviewer deemed a meta-analysis potentially eligible based on a review of the title and abstract, we carried out a full text review of the article. Any disagreement between reviewers after full-text evaluation was resolved by consensus after consultation with an independent third reviewer.

2.2. Data extraction

2.2.1. Meta-analyses

One investigator independently extracted data from each included meta-analysis publication into a standardized database. Data extraction was checked by a second reviewer and any disagreements were resolved by consensus. For each meta-analysis publication, we extracted author,

year of publication, journal, and journal impact factor for 2014. Some publications included results from more than one meta-analysis. In these publications, for each meta-analysis, separately, we extracted the name of the screening tool(s) evaluated, patients or setting, the number of primary depression screening accuracy studies from which data were meta-analyzed, and the number of unique patient samples from those studies.

2.2.2. Primary studies

For each primary study included in the meta-analyses we reviewed, we extracted the screening tool(s) evaluated, study population, the number of patients included in analyses, the number of depression cases included in analyses, and whether or not the primary study was from a publication indexed in MEDLINE. We did this by means of a known-item search, using the OvidSP platform. We conducted this search based on information in the full reference (title, author, year of publication, or other metadata) that was extracted from each primary study. For each primary study found in MEDLINE, we recorded its PubMed identification number. In addition, for all studies listed in MEDLINE, we checked whether the study would be retrieved using a previously published peer-reviewed search [9]. All data were extracted by one reviewer and validated by a second reviewer. Discrepancies were resolved by consensus.

For any primary studies not found in MEDLINE, we searched a core set of electronic databases in the health sciences (PsycINFO, Scopus, EMBASE, Web of Science, and CINAHL) using a similar approach to attempt to find the study. If the primary study was not indexed in any of these core databases, we then searched all additional databases that were searched in the original meta-analysis to determine the source database. If publications were still not found, Google Scholar was searched in an attempt to locate the database where the primary study was indexed. We recorded the database where the studies were located. If not located in any of our core databases or the original meta-analysis databases, we concluded that the study was not retrievable from the databases and had been identified via other methods in the original meta-analyses.

Of primary studies included in each included meta-analysis, we only extracted data for primary studies that compared a depression screening tool to a clinical interview or validated diagnostic interview to diagnose depression. We excluded from consideration primary studies where a depression screening tool was compared to a score on a rating scale (e.g. Hamilton Rating Scale for Depression), but not a diagnosis of depression, even if these were included in the meta-analyses.

When there were multiple publications from the same patient sample listed in a meta-analysis, we extracted data for each publication separately since a purpose of the present study was to ascertain the degree to which a MEDLINE search alone would identify all potentially relevant publications. However, we also identified publications that reported on the same or overlapping patient samples so that we could calculate the proportion of unique samples, patients, and depression cases that could have been found in MEDLINE.

If the number of depression cases for a primary study was not reported in the meta-analysis, we extracted the largest number of depression cases available from the primary study. For instance, if the primary study reported both number of major depression cases and number of patients with any depressive disorder, we extracted the larger number.

2.3. Comprehensiveness of searches of meta-analyses

To assess the comprehensiveness of the search used for each included meta-analysis, we identified (1) the number of electronic databases searched and the names of each database included with the platform used; (2) whether additional methods (e.g., reference lists of other reviews, reference lists of included primary studies, expert contacts, known-author searches, manual journal searches, forward citation searches of included primary studies, domain specific conference abstracts) were used and, if any, which were used (see Appendix B); (3) the years covered by the search; and (4) whether the search included a search filter, and if so, which one(s). We evaluated each component of

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