

# Systematic searching: Overview and guidance for searching addiction-related topics

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*This paper describes the systematic review process, laying the groundwork by providing the essentials for conducting a review. This includes the types of reviews, the sorts of well-formed questions used to start a search, and the process of determining the sources to be searched, in particular those essential to health research. Sources for guides and checklists are provided and the importance of employing best practices in searching and being accountable is emphasized. The core databases for searching ATOD (Alcohol Tobacco and other Drugs) topics include Medline / PubMed and PsycINFO. As these databases are indexed according to different controlled vocabulary terms and have unique features, strengths and limitations, as this article demonstrates, it is essential to develop different search strategies for each database, as well as other databases that are included in the review*

## Keywords

Literature reviews; Systematic reviews; Literature searching; Alcohol literature; Drug literature; Addiction literature

This paper is based on presentations by the authors on systematic searching at the SALIS 2015 conference. Karen Heskett opened with an overview on systematic searching and Sheila Lacroix focused on good practice in searching topics relating to alcohol, tobacco and other drugs (ATOD). Librarians are increasingly called to play a role in systematic reviews. In fact, some grants for funding systematic reviews now include a requirement that a librarian

conduct the literature searches. Overall, there has been an increase in expectations for accountability and rigor in research, publishing, and support for program funding. While not all librarians and information professionals are called to be involved in large complex searches, it is important to strive to employ best practices; to be consistent, accountable, and transparent; and to clearly convey search results. This includes documenting the process to ensure

transparency and reproducibility. It is also essential to keep abreast of important trends and improve competencies in evaluating literature and supporting patrons' research needs. In addition to providing a brief overview on systematic searching, this paper will also provide guidelines for searching ATOD-related topics.

## Overview and Laying the Groundwork

The systematic review process sets standards for reviewing the literature. The first step is a well-conducted and thorough search. This is where the librarian's expertise is required. However, knowing the process can be helpful for any search a librarian might perform. Systematic reviews are one type of review found in the literature. The three main types of reviews are:

- **Narrative Review:** Leads to an expert-prepared overview; may not be comprehensive; used to identify gaps in the literature.
- **Scoping Review:** Preliminary to the systematic review; often used to determine the quantity of research available; may lead to revising the topic.
- **Systematic Review:** Clearly planned; searches are fully described; methodological decisions are explained (Boland, Cherry, & Dickson, 2013).

Systematic reviews in health care cover a variety of article types including drug effectiveness reviews, rapid reviews, and technology assessments. Each has its own distinct advantage and particular sort of question to which it can respond. All employ systematic searching as a foundation.

There are obvious challenges in conducting these types of reviews, such as limits to the resources available, difficulty securing access to the various databases, and time constraints. Dealing with large search sets can also present saving and exporting challenges. Sometimes it is necessary to discuss the balance of relevant to irrelevant results with the patron and negotiate changes in the search strategy. It is never possible to

ensure that 100% of studies in a given field have been captured. In some cases, patrons will have two librarians from different institutions conduct their searches to ensure better coverage. Sometimes a peer review of the search strategy (PRESS) is helpful or required (Sampson, McGowan, Lefebvre, Moher, & Grimshaw, 2008). It is the patron or researcher who usually takes on the next steps: filtering the results with established inclusion and exclusion criteria and then analyzing and reporting on the evidence synthesized from the research that meets the criteria.

## The Search Strategy

The search strategy describes the methods used to identify the evidence as well as the details of the actual search to retrieve both the published and unpublished relevant literature specific to the topic (Boland et al., 2013). It includes not only how but where the search was conducted. Fortunately, there are standards for conducting reviews such as the well-known Cochrane Collaboration protocols and checklists such as PRISMA (please see the additional resources in the References section). The databases to be searched must be determined, which at a minimum should include Medline/PubMed, Embase, and CINAHL for medical and health topics and PsycINFO as well for ATOD topics. While some overlap exists, each database will contribute unique articles.

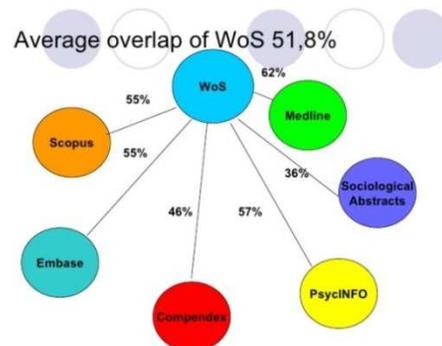


Fig 1. Average overlap of Web of Science (Iselid, 2006)

A search on the topic ‘injury prevention and safety promotion’ (IPSP) was used to demonstrate how essential it is to search more than one database, in particular for cross-disciplinary topics. A search of only one database on this topic retrieved 16.7 to 81.5% (median 43.4%) of articles on five key IPSP topics (Lawrence, 2008). When planning the actual database searches, specific features of the databases must be taken into consideration, such as controlled vocabulary, unique searchable fields, and important limitations; other strategies, such as hand searching and searching grey literature sources, and possibly search engines such as Google Scholar, should also be considered. Grey literature can be useful in counteracting the positive results bias that is found in the published scientific literature (Institute of Medicine, 2011).

One of the most important first steps is defining the research questions. This can be challenging for public health and ATOD searches because sometimes there is not an obvious population or a clear-cut intervention. As a rule of thumb, the PICO or PICOT(S) method is used: Patient, Population, Problem; Intervention; Comparison; Outcome(s); Time or Time Frame; and, sometimes, Study Types. Once this is established, one can start building the search terms for the various databases into the PICO structure. PICO is a helpful tool for any type of searching.

## **Searching ATOD topics: Good Practice**

First and foremost, it must be emphasized that many ATOD topics require searching the literature from different disciplines: medicine, allied health, public health, psychology, sociology, and even law. This is why, if available, multidisciplinary databases like Scopus and Web of Science can be very useful in casting a wider net. The downside of Web of Science and Scopus is that there is no controlled vocabulary for indexing, a challenge considering the multiple ways ATOD issues are expressed. Medline /

PubMed, herein referred to as Medline, and PsycINFO are the core databases for ATOD searches.

The focus for this section of the paper is an in-depth look into these two databases which originate from different disciplines and have evolved very differently. For Medline and PsycINFO, strengths, weaknesses and significant differences will be highlighted. Unfortunately, many patrons, in particular in medical institutions, tend to narrow in on Medline and Embase and do not recognize the value of searching PsycINFO. CINAHL is also frequently ignored by physicians and medical students.

The CAMH Library online guide, Literature Searching: Good Practice: an introductory guide for effectively and comprehensively searching for research-based literature on addiction, mental health and related issues (CAMH Library, n.d.) is a good starting point for the basics of planning and conducting a search. It also provides lists of key ATOD and mental health subject headings used in indexing Medline and PsycINFO.

One significant difference between Medline and PsycINFO are the subject headings as reflected both by the terminology and the hierarchical structures within the thesauri. For example, the thesaurus of the American Psychological Association (APA), used to index PsycINFO, places ‘substance abuse’ within the behavioral disorders tree, whereas in the National Library of Medicine’s (NLM) MeSH (Medical Subject Headings), which is used to index Medline, ‘substance abuse’ is classified under the ‘mental disorders’. APA uses headings such as addiction, drug addiction, heroin addiction, drug abuse, and alcohol abuse. MeSH terms are very different, including the broad category of substance-related disorders and narrower terms such as alcohol-related disorders, opioid-related disorders, and cocaine related disorders. APA and NLM introduced the subject heading ‘binge drinking’ as a narrower term under alcohol-related disorders (Medline) and alcohol abuse (PsycINFO) in 2013 and 2006

respectively. APA has seemed particularly in tune with the growing awareness of the need for a term to capture the concept of 'binge drinking', which can be expressed in many ways, to describe this type of consumption. Medline has subheadings which are very effective in honing in on specific issues. For example, in the substance-related disorders tree, subheadings such as 'rehabilitation', 'prevention and control', or 'nursing' can be used. In fact, more than one subheading can be applied at once. PsycINFO has the terms 'drug rehabilitation' and 'alcohol rehabilitation' to assist in searching for this concept. The above examples demonstrate how the controlled vocabulary used to index databases will impact the search strategy for Medline versus PsycINFO, as well as other databases that might be searched.

Two sample searches may help underscore the importance of searching both PsycINFO and Medline for historical coverage. A search for publications from 1950 to 1970 by Marie Nyswander, who researched treatments for opioid abusers, retrieved 17 articles, without abstracts, from Medline and 5 articles and 1 book from PsycINFO, with abstracts. The lack of abstracts provided by Medline in earlier decades limits the effectiveness of key word / key phrase searching, particularly an issue because there were fewer MeSH headings assigned in earlier decades than are usually applied today. PsycINFO provides better coverage for the *Quarterly Journal of Studies on Alcohol*. Between 1950 and 1959, Medline indexed 97 records and PsycINFO 285.

Journal coverage varies between Medline and PsycINFO. Two popular journals, *Contemporary Drug Problems* and the *Irish Journal of Psychological Medicine* have better coverage with PsycINFO. Both now index the *Harm Reduction Journal*, although NLM was slow to pick this up, only beginning to provide regular indexing in 2012. A search conducted on the relationship between cannabis use and psychosis (2012 publications, journal articles, English only) found an overlap of 40 articles, yet unique publications in both Medline and PsycINFO.

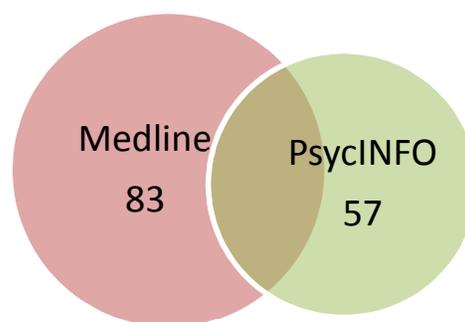


Fig 2. Cannabis & Psychosis

Finally, key journals such as *Addiction* are indexed more slowly in Medline than PsycINFO. The records may be added to the database, but cannot be searched using MeSH, only by key words / key phrases. To search for unindexed literature through Ovid Medline, one must search In Process Medline.

In summary, the above discussion provides arguments for the importance of searching both Medline and PsycINFO for ATOD topics. Both have their strengths. For Medline, strengths include in-depth indexing with MeSH, applying more subject headings than PsycINFO; subheadings for fine-tuning the search strategy; trusted 'limits' provided for randomized controlled trials (RCTs) and meta analyses; and the indexing of Cochrane Reviews. For PsycINFO, strengths include the availability of books, book chapters and dissertations; a searchable Tests and Measures field; in-depth indexing of behavioral therapies; and helpful Classification Codes, such as Forensic Psychology & Legal Issues, which can be searched by their numeric codes.

## Conclusion

This article demonstrates the importance of systematic searching, whether for a systematic review or a routine patron request for a literature review. A standard process which is documented and transparent should be followed. This involves determining the best databases and other sources to search, depending on the topic, and translating the

research question using PICO or PICOT(s), the framework for organizing the search concepts and search terms. For comprehensive reviews, it is necessary to search a variety of databases and include grey literature sources. Each database should be searched separately, taking advantage of their unique features and subject headings. Often key words and phrases must also be used to ensure topic coverage and to search for literature published before the introduction and application of specific subject headings. Terminology can be complex, discipline-specific, and affected by politics, geography, and standards. For ATOD searches, Medline

and PsycINFO are essential. Some other structured databases recommended, depending on the topic, are Embase, CINAHL, Sociological Abstracts, Gender Studies, Social Work Abstracts, and ERIC. The multidisciplinary databases Scopus and Web of Science should also be considered, particularly to ensure currency. One should also consider special library catalogues and specialized databases such as Guidelines.gov and ClinicalTrials.gov. SALIS provides a list with links (where available) on its website entitled *Alcohol, Tobacco, and Other Drugs Bibliographic Databases and Data Archives*.

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## Additional Web Resources

- CAMH Library. Literature Searching: Good Practice: an introductory guide for effectively and comprehensively searching for research-based literature on addiction, mental health and related issues. Retrieved from [http://guides.hsict.library.utoronto.ca/CAMH/LiteratureSearching\\_GoodPractice](http://guides.hsict.library.utoronto.ca/CAMH/LiteratureSearching_GoodPractice)
- SALIS. *Alcohol, Tobacco, and Other Drugs Bibliographic Databases and Data Archives*. Retrieved from [http://salis.org/resources/database\\_list.html](http://salis.org/resources/database_list.html)

## Systematic Reviews: Standards and Checklists

- Cochrane Collaboration: <http://community.cochrane.org/>. Multiple resources and publications. The most recent (2011) *Cochrane Handbook* is available, <http://handbook.cochrane.org/>
- The Campbell Collaboration: <http://www.campbellcollaboration.org/>. See the Resource Centre. Centre for Reviews and Dissemination, University of York, U.K.
- Systematic Reviews guidance: [https://www.york.ac.uk/media/crd/Systematic\\_Reviews.pdf](https://www.york.ac.uk/media/crd/Systematic_Reviews.pdf)

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta Analyses. Retrieved from <http://prisma->

[statement.org/documents/PRISMA%202009%20checklist.pdf](http://statement.org/documents/PRISMA%202009%20checklist.pdf)

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