Quality assessing data collection

Using Quality Assessment tools as a checklist for your systematic search

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Health Research Board

Research. Evidence. Action.

Outline

- Quality/Critical assessment tools for *SR* include QA of Search Strategy
  - Current guidance – Cochrane Handbook, Cochrane MECIR, and CRD
  - AMSTAR 2
  - JBI
  - CASP
  - Practical Exercise – *grade this search!*
- Guidance for *Rapid Reviews* & *Scoping Reviews*
- PRISMA-S reporting tool (not QA)
- PRESS Peer review tool (not QA)
- Poor Reporting

Guidance (1/3) Cochrane Handbook

- Chapter 4: Searching for and selecting studies
  - 4.1 Introduction
  - 4.2 General issues
  - 4.3 Sources to search
    - 4.3.1 Bibliographic databases
    - 4.3.2 Ongoing studies and unpublished data sources
    - 4.3.3 Trials registers and trials results registers
    - 4.3.4 Regulatory agency sources and clinical study reports
    - 4.3.5 Other sources

C36: Documenting the search process (**Mandatory**)

Document the search process in enough detail to ensure that it can be reported correctly in the review.

The search process (including the sources searched, when, by whom, and using which terms) needs to be do
throughout the proce
reported correctly in t
all the searches of all
reproducible.

Guidance (2/3) (MECIR)

MECIR Box 4.3.e Relevant expectations for conduct of intervention reviews

↑ Scroll to see more ↑

C28: Searching for grey literature (**Highly desirable**)

Search relevant grey literature sources such as reports, dissertations, theses and conference abstracts.	Searches for studies should be as extensive as possible in order to reduce the risk of publication bias and to identify as much relevant evidence as possible.

C29: Searching within other reviews (**Highly desirable**)

Search within previous reviews on the same topic.	Searches for studies should be as extensive as possible in order to reduce the risk of publication bias and to identify as much relevant evidence as possible.

C30: Searching reference lists (**Mandatory**)

Check reference lists in included studies and any relevant systematic reviews identified.	Searches for studies should be as extensive as possible in order to reduce the risk of publication bias and to identify as much relevant evidence as possible.

C28	*Searching for grey literature*	***Highly desirable***	
	Search relevant grey literature sources such as reports, dissertations, theses and conference abstracts.	Searches for studies should be as extensive as possible in order to reduce the risk of publication bias and to identify as much relevant evidence as possible.	See *Handbook* Section 4.3.5

Guidance (3/3) CRD's Guidance for Undertaking Reviews in Health Care

Summary: Identifying research evidence for systematic reviews

- The search for studies should be comprehensive.
- The extent of searching is determined by the research question and the resources available to the research team.
- Thorough searching is best achieved by using a variety of search methods (electronic and manual) and by searching multiple, possibly overlapping resources.
- Most of the searching is likely to take place at the beginning of the review with an update search towards the end.
- Using bibliographic software to record and manage references will help in documenting the process, streamline document management and make the production of reference lists for reports and journal papers easier.
- The search process should be documented in full or details provided of where the strategy can be obtained.

AMSTAR 2 (1/5)

- AMSTAR 2 (A MeaSurement Tool to Assess systematic Reviews)

AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both

1. Did the research questions and inclusion criteria for the review include the components of PICO?

For Yes:
- ☐ Population
- ☐ Intervention
- ☐ Comparator group
- ☐ Outcome

Optional (recommended)
- ☐ Timeframe for follow-up

- ☐ Yes
- ☐ No

2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?

For Partial Yes:
The authors state that they had a written protocol or guide that included ALL the following:

For Yes:
As for partial yes, plus the protocol should be registered and should also have specified:

- ☐ Yes

AMSTAR 2 (2/5) : a critical appraisal tool for systematic reviews that include randomised or nonrandomised studies of healthcare interventions, or both

4. Did the review authors use a comprehensive literature search strategy?

For Partial Yes (all the following):

- ☐ searched at least 2 databases (relevant to research question)
- ☐ provided key word and/or search strategy
- ☐ justified publication restrictions (e.g. language)

- ☐ Yes
- ☐ Partial Yes
- ☐ No

AMSTAR 2 (3/5) : a critical appraisal tool for systematic reviews that include randomised or nonrandomised studies of healthcare interventions, or both

4. Did the review authors use a comprehensive literature search strategy?

For Yes, should also have (all the following):

- ☐ searched the reference lists / bibliographies of included studies
- ☐ searched trial/study registries
- ☐ included/consulted content experts in the field
- ☐ where relevant, searched for grey literature
- ☐ conducted search within 24 months of completion of the review

- ☐ Yes
- ☐ Partial Yes
- ☐ No

AMSTAR 2 (4/5) : Q4 Did the review authors use a comprehensive literature search strategy?

For Partial Yes (all the following):

1. searched at least 2 databases (relevant to research question)
2. provided key word and/or search strategy
3. justified publication restrictions (e.g. language)

AMSTAR 2 (5/5) : Q4 Did the review authors use a comprehensive literature search strategy?

For Full Yes, a study should also have all the following:

4. searched the reference lists / bibliographies of included studies

5. searched trial/study registries

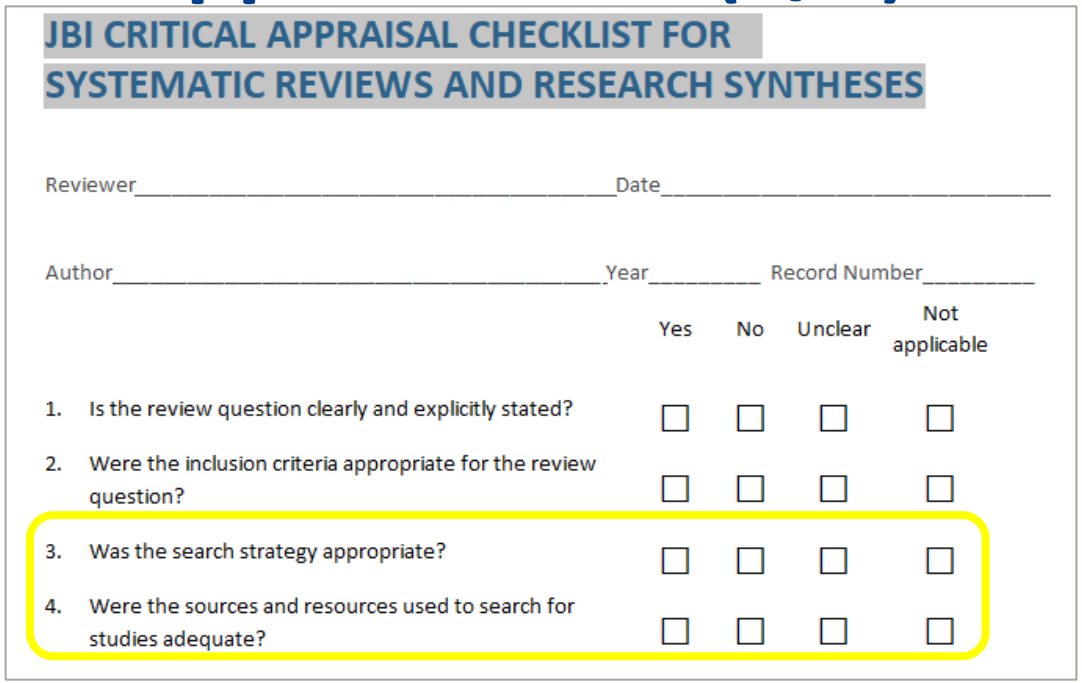
6. included/consulted content experts in the field

7. where relevant, searched for grey literature

8. conduct search within 24 months prior of completion of the review

JBI Critical Appraisal Tool (1/3)

https://jbi.global/critical-appraisal-tools



JBI CRITICAL APPRAISAL CHECKLIST FOR SYSTEMATIC REVIEWS AND RESEARCH SYNTHESES

Reviewer_____Date_____

Author_____Year_____ Record Number_____

	Yes	No	Unclear	Not applicable
1. Is the review question clearly and explicitly stated?	☐	☐	☐	☐
2. Were the inclusion criteria appropriate for the review question?	☐	☐	☐	☐
3. Was the search strategy appropriate?	☐	☐	☐	☐
4. Were the sources and resources used to search for studies adequate?	☐	☐	☐	☐

JBI (2/3):Q3 “Was the search strategy appropriate?”

1. evidence of the search strategy
2. search strategy addresses each of the identifiable PICO components
3. describe approach to searching - how search terms were derived
4. evidence of logical and relevant keywords and terms, Subject Headings and Indexing terms
5. limits –and their impact - should also be considered

JBI (3/3):Q4 “Were the sources and resources used to search for studies adequate?”

5. evidence of a comprehensive search strategy

6. search multiple major bibliographic citation databases such as MEDLINE and CINAHL

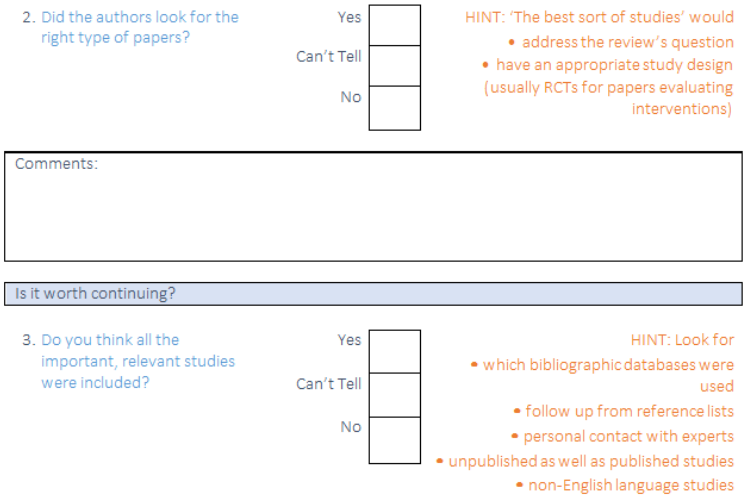
7. search other databases that are relevant to the review question

8. reviews of effectiveness should aim to search trial registries.

9. search for grey literature, or “unpublished” studies

CASP Checklist: 10 questions to help you make sense of a Systematic Review

https://casp-uk.net/casp-tools-checklists/



2. Did the authors look for the right type of papers?

Yes ☐
Can't Tell ☐
No ☐

HINT: 'The best sort of studies' would
- address the review's question
- have an appropriate study design (usually RCTs for papers evaluating interventions)

Comments:

Is it worth continuing?

3. Do you think all the important, relevant studies were included?

Yes ☐
Can't Tell ☐
No ☐

HINT: Look for
- which bibliographic databases were used
- follow up from reference lists
- personal contact with experts
- unpublished as well as published studies
- non-English language studies

Practical Work: assess these studies!

10 minutes, 2 systematic reviews,

2 Quality Assessment tools!

Grade each search strategy

Would you exclude or include

this systematic review based on

the search strategy and data collection?

Guidance on literature search of Rapid Reviews (Klerings et al., 2023) (1/2)

Research methods and reporting

Table 1 Recommendations for rapid review literature searching

Recommendation for rapid review (RR) searching		Potential differences with systematic review (SR) searching	Additional information (appendix)
Preparation and planning	Involve an information specialist (eg, librarian), ideally from the start of the project. At a minimum, an information specialist should assess the information sources, search methods, and the primary database search strategy.	None. However, information specialist involvement can speed up the further steps of the search process.	Online supplemental appendix C 1.1
	Consider using PRISMA-S[11] and prepared templates for planning and conducting the search to ensure the search process is thoroughly planned.	PRISMA-S and general templates might need to be adapted to the chosen RR approach.	Online supplemental appendix B
	Conduct preliminary or scoping searches to identify a first set of potentially relevant literature, which will aid in topic refinement, selection of information sources and selection of search terms.	None. This is a crucial step for any systematic search.	Online supplemental appendix C 1.2–3
Information sources and search methods	Select a small number (at least 2) of information sources that are likely to retrieve relevant literature.	SRs generally use a larger number of information sources to ensure sensitivity.	Online supplemental appendix C 2.1–4
	For RRs based on RCTs, use, at a minimum, a combination of two of these databases: MEDLINE, CENTRAL, Embase. In some cases, combining one of these databases (in particular MEDLINE) with an appropriate supplementary search method (eg, similar articles, study register searching) may suffice.	Both bibliographic databases and grey trial registers have to be searched. E.g.,MECIR[9] requires searching MEDLINE, CENTRAL, Embase, linicalTrials.gov, and the WHO International Clinical Trials Registry Platform (ICTRP) to identify RCTs.	Online supplemental appendix C 2.2
	Use the findings of preliminary searches to assess if grey literature may be relevant for a topic and what types (eg, clinical trial registrations, preprints, theses).	SRs generally include grey literature searches independent of the topic.	Online supplemental appendix B and C 2.1
Search strategies	Review the abstracts and subject headings of known relevant records for appropriate search terms.	SR search strategies generally aim to maximise sensitivity. RR searches may aim to increase precision to reduce the search result.	Online supplemental appendix B,C 3.1–2
	Identify SRs on the same or a similar topic and review the search strategies for elements that could be reused (eg, population, intervention).	Most SRs searches are developed de novo for a particular review.	Online supplemental appendix C 3.1–2
	Use limits and restrictions appropriately and with caution.	SRs should not restrict searches to languages, publication dates, etc.	Online supplemental appendix C 3.4–5
	When updating an existing review, assess the original search methods and adapt as necessary.	None. Consider utilising guidance for updating SRs.[39]	
Quality assurance and search strategy peer review	Validate the primary search strategy by testing if known relevant records are retrieved.	None. However, SR searches generally aim to find all known relevant records, while in precision-focused RR searches, a reduced sensitivity might be acceptable.	Online supplemental appendix C 4.1
	Use the PRESS checklist[42] to peer review the primary search strategy. If full peer review is not possible, check the primary search strategy for errors of spelling, operator usage, and line number combinations.	Full PRESS peer review is recommended for all SRs.	Online supplemental appendix C 4.2
	Review the appropriateness of planned information sources and search methods.	None. However, this is particularly important if few information sources and search methods are used.	Online supplemental appendix C 4.2
Reporting and record management	Decide on systems and processes for managing records early in the review planning stage.	None. However, appropriate planning can save time throughout the process.	Online supplemental appendix C 5.1–3
	Consider using PRISMA-S[11] as reporting standard for RR searches.	PRISMA-S has been developed for SR searches. It might need to be adapted to the chosen RR approach .	Online supplemental appendix B and C 5.1
	Use reference management software (eg, EndNote, Zotero) and/or SR platforms (eg, Covidence, Systematic Review Data Repository Plus) to track search results throughout the review process.	None. However, the appropriate use of these tools can save time throughout the process.	Online supplemental appendix C 5.2–3

MECIR, Methodological Expectations of Cochrane Intervention Reviews; PRESS, Peer Review of Electronic Search Strategies; PRISMA-S, Preferred Reporting Items for Systematic Reviews and Meta-Analyses literature search extension; RCT, randomised controlled trial; RR, rapid review.

Guidance on literature search of Rapid Reviews (Klerings et al., 2023) (2/2)

	Search strategy	Trial registers	Database (2+) ; Subject database	Grey Lit.	w/24 months	Consult with experts	Show search strategy develop.	Ref and cite search	Justified limits e.g. date, language	Show the impacts of limits	Search for PICO	IS or MedLib-led search
Klerings et al.	Yes + (i) updating search strategy; (ii) Search should be interface/ database specific (iii) Validate search strategy	Y	Specifies 2 of 3: MEDLINE, EMBASE, and CENTRAL OR 1 + supp. search method	y		y	y	y	y	n	y	Yes + (i)PRESS; (ii) PRISMA-S to report search (iii) Ref mgt software + SR mgt software

Scoping Review

Scoping Methodological quality, guidance, and tools in scoping reviews: a scoping **review protocol** Pollock et al, 2022 DOI: 10.11124/JBIES-20-00570

Scoping studies: towards a methodological framework (Arksey & O'Malley, 2003)

“There are a number of issues researchers need to consider before undertaking this important stage of the process such as: which databases to search; what kinds of related terms might be appropriate to search for, in addition to key concepts; piloting the search strategy to allow for refinement; whether any technical searching skills are available to assist with the searches; and what the potential costs are of online access to electronic databases, inter-library loans and photocopying full articles that are available locally.” Source: https://doi.org/10.1080/1364557032000119616

Comparison of data collection CA tools

	Search strategy	Trial registers	Database (2+) ; Subject database	Grey Lit.	w/24 months	Consult with experts	Show search strategy deve/dev of concepts	Ref and cite search	Justified limits e.g. date, language	Show the impacts of limits	Search for each element of the PICO	IS or MedLib-led search
AMSTAR 2	X	X	X	X	X	X	X	X	X			
JBI	X	X	X	X			X		X	X	X	
Rapid Review (not CA)	X	X	X	X			X		X			X
CASP	X		X	X		X		X				

PRISMA-S and PRESS

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PRESS and PRISMA-S

PRESS: Peer Review of Electronic Search Strategies (McGowan *et al. 2015*)

PRISMA-S: an extension to the PRISMA Statement for Reporting Literature Searches in Systematic Reviews (Rethlefsen *et al. 2021*)

PRESS

- Peer-review checklist of the **search process** itself
- Quality approach / good practice
- PRESS Peer Review of Electronic Search Strategies: 2015 Guideline Statement (McGowan et al, 2016)

PRISMA-S

- **PRISMA-S** tells you how to **report** the search
- **PRISMA-S Checklist**: https://osf.io/y765x/
- Critically appraising systematic review search strategies using PRISMA. Carrie Price (2023): https://youtu.be/xceIA23Fncc?si=Ez_BQMOziQAB_1RM

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PRESS

GUIDELINE STATEMENT

PRESS Peer Review of Electronic Search Strategies: 2015 Guideline Statement

Jessie McGowan[a,b,*], Margaret Sampson[c], Douglas M. Salzwedel[d], Elise Cogo[e], Vicki Foerster[f], Carol Lefebvre[b,g]

PRESS Checklist: Six core elements

- The translation of the research question into PICO
- Boolean and proximity operators
- Database-specific subject headings,
- Text word searching (free text)
- Spelling, syntax, and line numbers
- Limits and filters

PRESS Checklist: Research question

Translation of the research question

- Does the search strategy match the research question/PICO?
- Are the search concepts clear?
- Are there too many or too few PICO elements included?
- Are the search concepts too narrow or too broad?
- Does the search retrieve too many or too few records? (Please show number of hits per line.)
- Are unconventional or complex strategies explained?

PRESS Checklist: Very detailed!

Boolean and proximity operators (these vary based on search service)

- Are Boolean or proximity operators used correctly?
- Is the use of nesting with brackets appropriate and effective for the search?
- If NOT is used, is this likely to result in any unintended exclusions?
- Could precision be improved by using proximity operators (eg, adjacent, near, within) or phrase searching instead of AND?
- Is the width of proximity operators suitable (eg, might adj5 pick up more variants than adj2)?

PRESS Checklist: Librarian guidance

3	Subject headings (database specific): Assess whether there is enough scope in the selection of subject headings to optimize recall.	Examine the following elements of subject heading usage: missing or incorrect headings, relevance/irrelevance of terms, and correct use of explosion to include relevant narrower terms. Consider the use of floating subheadings which are in most instances preferable to using subheadings attached to specific subject headings (e.g., in MEDLINE, "Neck Pain/and su.fs." rather than "Neck Pain/su"). Note that subject headings and subheadings are database specific.

PRISMA-S

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PRISMA-S: Reporting guideline

Research | Open access | Published: 26 January 2021

PRISMA-S: an extension to the PRISMA Statement for Reporting Literature Searches in Systematic Reviews

Melissa L. Rethlefsen, Shona Kirtley, Siw Waffenschmidt, Ana Patricia Ayala, David Moher, Matthew J. Page, Jonathan B. Koffel & PRISMA-S Group

Systematic Reviews **10**, Article number: 39 (2021) | Cite this article

PRISMA-S: Aims

1. To provide extensive guidance on **reporting** the literature search components of a systematic review.
2. To create a checklist that could be used by authors, editors, and peer reviewers to verify that each component of a search was completely **reported** and therefore reproducible.
3. To develop an interdisciplinary checklist applicable to all method-driven literature searches for evidence synthesis.
4. To complement the PRISMA Statement and its extensions.

PRISMA-S: Sections

The four elements of the PRISMA-S checklist are:

- Information sources and methods
- Search strategies
- Peer review
- Managing records

PRISMA-S: Topics

Information Sources and Methods

- Database name
- Multi-database searching
- Study registries
- Online resources and browsing
- Citation searching
- Contacts
- Other methods

PRISMA-S: Search strategies

Section/topic	#	Checklist item	Location reported
SEARCH STRATEGIES			
Full search strategies	8	Include the search strategies for each database and information source, copied and pasted exactly as run.	
Limits and restrictions	9	Specify that no limits were used, or describe any limits or restrictions applied to a search (e.g., date or time period, language, study design) and provide justification for their use.	
Search filters	10	Indicate whether published search filters were used (as originally designed or modified), and if so, cite the filter(s) used.	
Prior work	11	Indicate when search strategies from other literature reviews were adapted or reused for a substantive part or all of the search, citing the previous review(s).	
Updates	12	Report the methods used to update the search(es) (e.g., rerunning searches, email alerts).	
Dates of searches	13	For each search strategy, provide the date when the last search occurred.	

PRISMA-S: Search strategy write-up

Appendix A Search strategies

Database: MEDLINE

Platform: EBSCO

Search date: 01/10/2024

Search line	Search terms	Results
1.	(MH "Libraries, Medical")	5,383
2.		
3.		

PRISMA-S: Zotero

Creator	Date	Title	Publication	Item ...
Rethlefsen and Page	2022	PRISMA 2020 and PRISMA-S: common questio...	Journal of th...	Journ...
Rethlefsen et al.	2021-0...	PRISMA-S: an extension to the PRISMA Statem...	Systematic R...	Journ...
Shea et al.	2017	AMSTAR 2: a critical appraisal tool for systemati...	BMJ	Journ...
McGowan et al.	2016-0...	PRESS Peer Review of Electronic Search Strategi...	Journal of Cli...	Journ...

PRISMA-S: Final sections

Section/topic	#	Checklist item	Location reported
PEER REVIEW			
Peer review	14	Describe any search peer review process.	
MANAGING RECORDS			
Total Records	15	Document the total number of records identified from each database and other information sources.	
Deduplication	16	Describe the processes and any software used to deduplicate records from multiple database searches and other information sources.	

Conclusion

Summary

Using quality assessment tools such as AMSTAR, or JBI's Critical Appraisal tool can help you plan, test and carry out your search, so that it meets the standards expected from published reviews.

These checklists are good reminders as to what needs to be done to produce a useful search – one that will be of sufficient quality (and reported in sufficient detail) to meet a peer reviewer's standards

Questions for the group

Do you carry out searches for your library users?

Are you involved in publication of research?

Have you ever had researchers come to you with a search asking you to fix it for publication??

Have you peer-reviewed or assessed searches or journal articles?

What other tools have you found useful in designing and carrying out searches?

References

References 1

Cochrane Handbook [update pending]
https://training.cochrane.org/handbook/current/chapter-04

Centre for Reviews and Dissemination (CRD)
https://www.york.ac.uk/media/crd/Systematic_Reviews.pdf

MECIR Manual (2023) https://community.cochrane.org/mecir-manual

References 2

AMSTAR 2: https://amstar.ca/docs/AMSTAR-2.pdf

JBI: https://jbi.global/critical-appraisal-tools

CASP: https://casp-uk.net/glossary/systematic-review/

Klerings I, Robalino S, Booth A, *et al.* Rapid reviews methods series: Guidance on literature search. *BMJ Evidence-Based Medicine,* 2023. doi: 10.1136/bmjebm-2022-112079

Arksey & O'Malley: https://doi.org/10.1080/1364557032000119616

References 3

PRISMA-S: http://www.prisma-statement.org/Extensions/Searching

Rethlefsen *et al.* PRISMA-S: an extension to the PRISMA Statement for Reporting Literature Searches in Systematic Reviews. *Syst Rev* **10**, 39 (2021). https://doi.org/10.1186/s13643-020-01542-z

McGowan *et al.* PRESS Peer Review of Electronic Search Strategies: 2015 Guideline Statement J Clin Epidemiol. **75**: 40-46 (2016) https://doi.org/10.1016/j.jclinepi.2016.01.021

References 4

Rethlefsen and Page. PRISMA 2020 and PRISMA-S: common questions on tracking records and the flow diagram. J Med Libr Assoc. 2022 Apr 1;110(2):253-257. https://doi.org/10.5195/jmla.2022.1449