COFFEE LECTURE

PRISMA for Systematic Review Projects: Tips for Researchers

Tania Rivero, MLIS
Research Support Services Team
Medical Library

Wednesday
19.04.2023
13:00, Zoom
Aim for today’s session

- Introduce the PRISMA statement and related content
- Offer tips/considerations when using PRISMA and extensions
- Highlight common pitfalls
- Show examples of good reporting
PRISMA
What is PRISMA?

- PRISMA stands for the Preferred Reporting Items for Systematic Reviews and Meta-Analyses
- It is an evidence based guideline to facilitate transparent reporting
- In 2020, it was updated due to new advancements in evidence syntheses and technologies
- PRISMA has a 27 item checklist and flow diagram
What is PRISMA?

- Key changes were made from the 2009 to 2020 statement
- 4 newly created items
- Revised flow diagram (4 templates)
- Use and cite the PRISMA 2020 statement for all future SR publications

Table 1. Summary of changes to the PRISMA 2020 item checklist.

<table>
<thead>
<tr>
<th>Checklist Item</th>
<th>Amendment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>The PRISMA 2020 statement directs authors towards a new, stand-alone abstract checklist</td>
</tr>
<tr>
<td>Methods</td>
<td>Display full search strategies for all databases, registers, and websites used, rather than for at least one database</td>
</tr>
<tr>
<td>Search</td>
<td>Disclose the number of reviewers allocated to screening each study and whether they worked autonomously. Disclose details regarding the utilisation of automation tools</td>
</tr>
<tr>
<td>Study selection</td>
<td>Report all outcome definitions. For each outcome, disclose which results were collected or not and the methodology behind these selections</td>
</tr>
<tr>
<td>Data items</td>
<td>Divided into six sub-items: 1. Describe how eligible studies for each synthesis were identified 2. Describe the methodology used to prepare data for presentation or synthesis</td>
</tr>
</tbody>
</table>

What is PRISMA?
PRISMA
What is PRISMA?

- There are extensions of the PRISMA statement for other types of projects
- All extensions contain key documents
- New extensions are being developed
- Review the PRISMA website to identify and incorporate the most appropriate extension(s)
PRISMA
Website

Welcome to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) website!

PRISMA is an evidence-based minimum set of items for reporting in systematic reviews and meta-analyses. PRISMA primarily focuses on the reporting of reviews evaluating the effects of interventions, but can also be used as a basis for reporting systematic reviews with objectives other than evaluating interventions (e.g., evaluating etiology, prevalence, diagnosis or prognosis).

Who should use PRISMA?

- Authors: PRISMA aims to help authors improve the reporting of systematic reviews and meta-analyses.
- Journal Peer reviewers and editors: PRISMA may also be useful for critical appraisal of published systematic reviews, although it is not a quality assessment instrument to gauge the quality of a systematic review.

Key Documents

- PRISMA 2020 Checklist
- PRISMA 2020 flow diagram
- PRISMA 2020 Statement
- PRISMA 2020 Explanation and Elaboration
Several extensions of the PRISMA Statement have been developed to facilitate the reporting of different types or aspects of systematic reviews. Please click on the relevant extension below for more information.

- PRISMA for Abstracts
- PRISMA for Acupuncture
- PRISMA for Diagnostic Test Accuracy
- PRISMA for EcoEvo
- PRISMA Equity
- PRISMA Harms (for reviews including Harm outcomes)
- PRISMA Individual Patient Data
- PRISMA for Network Meta-Analyses
- PRISMA for Protocols
- PRISMA for Scoping Reviews
- PRISMA for Searching
- Extensions in development

http://prisma-statement.org/Extensions/
PRISMA

Extentions

• Some extensions address particular aspects

• PRISMA-P is an extension for SR protocols

• PRISMA-S is for literature searches

• PRISMA-P and PRISMA-S are complementary to the PRISMA 2020
PRISMA

How do they work together?

PRISMA-P

Outlines the plan for entire project

PRISMA 2020

Guidance for reporting in the manuscript

PRISMA-S

Key reporting details for the literature searches
Start with your protocol

PRISMA for systematic review protocols (PRISMA-P)

PRISMA was published in 2015 aiming to facilitate the development and reporting of systematic review protocols. For more information about PRISMA-P protocols, see here.

Statement paper:

Explanation and Elaboration paper:

Key Documents
- Checklist - POF | Word
- Statement
- ECE
- Operationalized Checklist from BMC Systematic Reviews

What is a protocol?

A systematic review protocol describes the rationale, hypothesis, and planned methods of the review. It should be prepared before a review is started and used as a guide to carry out the review.

Detailed protocols should be developed a priori, made publicly available, and registered in a registry such as PROSPERO.

To find out more about systematic review protocols, click on the links below:
- Why protocols?
- Protocol Guidance
- Systematic Review registration

http://prisma-statement.org/Extensions/Protocols
http://prisma-statement.org/Protocols/
Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation

Larissa Shamseer¹, David Moher¹, Mike Clarke⁵, Davina Ghersi², Alessandro Liberati (deceased)⁴, Mark Petticrew⁵, Paul Shekelle⁶, Lesley A Stewart⁷, the PRISMA-P Group

PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol

<table>
<thead>
<tr>
<th>Section and topic</th>
<th>Item No</th>
<th>Checklist item</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADMINISTRATIVE INFORMATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identification</td>
<td>1a</td>
<td>Identify the report as a protocol of a systematic review</td>
</tr>
<tr>
<td>Update</td>
<td>1b</td>
<td>If the protocol is for an update of a previous systematic review, identify as such</td>
</tr>
<tr>
<td>Registration</td>
<td>2</td>
<td>If registered, provide the name of the registry (such as PROSPERO) and registration number</td>
</tr>
<tr>
<td>Authors:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact</td>
<td>3a</td>
<td>Provide names, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author</td>
</tr>
<tr>
<td>Contributions</td>
<td>3b</td>
<td>Describe contributions of protocol authors and identify the generator of the review</td>
</tr>
<tr>
<td>Amendments</td>
<td>4</td>
<td>If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important amendment(s)</td>
</tr>
<tr>
<td>Support:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sources</td>
<td>5a</td>
<td>Indicate sources of financial or other support for the review</td>
</tr>
<tr>
<td>Sponsor</td>
<td>5b</td>
<td>Provide name for the review sponsor and/or sponsor</td>
</tr>
<tr>
<td>Role of sponsor or funder</td>
<td>5c</td>
<td>Describe role of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rationale</td>
<td>6</td>
<td>Describe the rationale for the review in the context of what is already known</td>
</tr>
<tr>
<td>Objectives</td>
<td>7</td>
<td>Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparisons, and outcomes (PICO)</td>
</tr>
<tr>
<td>METHODS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eligibility criteria</td>
<td>8</td>
<td>Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used in criteria for eligibility for the review</td>
</tr>
<tr>
<td>Information sources</td>
<td>9</td>
<td>Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage</td>
</tr>
<tr>
<td>Search strategy</td>
<td>10</td>
<td>Present flow of studies strategy to be used for at least one electronic database, including planned limits, such that it could be replicated</td>
</tr>
<tr>
<td>Study records:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data management</td>
<td>11a</td>
<td>Describe the mechanism(s) that will be used to manage records and data throughout the review</td>
</tr>
</tbody>
</table>
PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews

BMJ 2021; 372: doi: https://doi.org/10.1136/bmj.n160 (Published 29 March 2021)
Cite this as: BMJ 2021;372:n160

Example of item 6 of PRISMA 2020 checklist
"On 21 December 2017, M4 searched 16 health, social care, education, and legal databases, the names and date coverage of which are given in the Table 1. We also carried out a ‘snowball’ search to identify additional studies by searching the reference lists of publications eligible for full-text review and using Google Scholar to identify and screen studies citing them. On 26 April 2018, we conducted a search of Google Scholar and additional supplementary searches for publications on websites of 10 relevant organisations (including government departments, charities, think tanks, and research institutes). Full details of these supplementary searches can be found in the Additional file. Finally, we updated the database search on 7 May 2019, and the snowball and additional searches on 10 May 2019 as detailed in the Additional file. We used the same search method, except that we narrowed the searches to 2017 onwards."

Table 1. The table displays for each database consulted its name (such as MEDLINE, the interface or platform through which the database was searched such as Ovid, and the date of coverage reproduced from its website.)

Search strategy
Item 7. Present the full search strategies for all databases, registers, and websites, including any filters and limits used

Example of item 7 of PRISMA 2020 checklist
"Note: the following is an abridged version of an example presented in full in supplementary table S1 on bmj.com.
MEDLINE In Process & Other Non-Indexed Citations and OVID MEDLINE were searched via OvidSP. The database coverage was 1946 to present and the databases were searched on 29 August 2013.
1. Urinary Bladder, Dysfunction/.
2. OveractiveBladder or overactive Bladder or hyperactive Bladder or unstable or instability or incontinence adj3 bladder/.
3. OAB or OABs or IC or ICS or OABDS.
4. Urgency Syndrome or urge frequency/.
5. Over active or overactive Bladder or hyperactive Bladder or unstable or instability adj3 detrusor/.
6. Urinary Disorders/.
7. exp Urinary Incontinence/.
8. Urinary Bladder Dysfunction/.

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

Melissa L. Rethlefsen \( ^1 \), Shona Kirley \( ^2 \), Siw Waffenschmidt \( ^3 \), Ana Patricia Ayala \( ^4 \), David Moher \( ^2 \), Matthew J. Page \( ^5 \), Jonathan B. Koffel \( ^6 \) and PRISMA-S Group

Abstract

Background: Literature searches underlie the foundations of systematic reviews and related review types. Yet, the literature searching component of systematic reviews and related review types is often poorly reported. Guidance for literature search reporting has been diverse, and, in many cases, does not offer enough detail to authors who need more specific information about reporting search methods and information sources in a clear, reproducible way. This document presents the PRISMA-S (Preferred Reporting Items for Systematic reviews and Meta-Analyses literature search extension) checklist, and explanation and elaboration.

Methods: The checklist was developed using a 3-stage Delphi survey process, followed by a consensus conference and public review process.

Results: The final checklist includes 16 reporting items, each of which is detailed with exemplar reporting and

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Item 2. Multi-database searching

If databases were searched simultaneously on a single platform, state the name of the platform, listing all of the databases searched.

Examples

- “The MEDLINE and Embase strategies were run simultaneously as a multi-file search in Ovid and the results de-duplicated using the Ovid de-duplication tool.” [51]

- “A systematic literature search was performed in Web of Knowledge™ (including KCI Korean Journal Database, MEDLINE, Russian Science Citation Index, and SciELO Citation Index).” [52]

Explanation

Authors may choose to search multiple databases at once through a single search platform to increase efficiency. Along with the name of the platform, it is necessary to list the names of

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Item 4. Online resources and browsing

Describe any online or print source purposefully searched or browsed (e.g., tables of contents, print conference proceedings, web sites), and how this was done.

Examples

- “We also searched the grey literature using the search string: “public attitudes” AND “sharing” AND “health data” on Google (in June 2017). The first 20 results were selected and screened.” [60]
PRISMA

PRISMA-S

- Checklist has 16 items
- It can be used by authors from a wide range of disciplines
- Works well for other review types

<table>
<thead>
<tr>
<th>Section/topic</th>
<th>P</th>
<th>Checklist item</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFORMATION SOURCES AND METHODS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Database name</td>
<td>1</td>
<td>Name each individual database searched, stating the platform for each.</td>
</tr>
<tr>
<td>Multi-database searching</td>
<td>2</td>
<td>If databases were searched simultaneously on a single platform, state the name of the platform, listing all of the databases searched.</td>
</tr>
<tr>
<td>Study registries</td>
<td>3</td>
<td>List any study registries searched.</td>
</tr>
<tr>
<td>Online resources and browsing</td>
<td>4</td>
<td>Describe any online or print source purposefully searched or browsed (e.g., tables of contents, print conference proceedings, web sites), and how this was done.</td>
</tr>
<tr>
<td>Citation searching</td>
<td>5</td>
<td>Indicate whether cited references or citing references were examined, and describe any methods used for locating cited/citing references (e.g., browsing reference lists, using a citation index, setting up email alerts for references citing included studies).</td>
</tr>
<tr>
<td>Contacts</td>
<td>6</td>
<td>Indicate whether additional studies or data were sought by contacting authors, experts, manufacturers, or others.</td>
</tr>
<tr>
<td>Other methods</td>
<td>7</td>
<td>Describe any additional information sources or search methods used.</td>
</tr>
<tr>
<td>SEARCH STRATEGIES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full search strategies</td>
<td>8</td>
<td>Include the search strategies for each database and information source, copied and pasted exactly as run.</td>
</tr>
<tr>
<td>Limits and restrictions</td>
<td>9</td>
<td>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.</td>
</tr>
<tr>
<td>Search filters</td>
<td>10</td>
<td>Indicate whether published search filters were used (as originally designed or modified), and if so, cite the filter(s) used.</td>
</tr>
<tr>
<td>Prior work</td>
<td>11</td>
<td>Indicate when search strategies from other literature reviews were adopted or reused for a substantive part or all of the search, citing the previous review(s).</td>
</tr>
<tr>
<td>Updates</td>
<td>12</td>
<td>Report the methods used to update the search(es) (e.g., rerunning searches, email alerts).</td>
</tr>
<tr>
<td>Dates of searches</td>
<td>13</td>
<td>For each search strategy, provide the date when the last search occurred.</td>
</tr>
<tr>
<td>PEER REVIEW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer review</td>
<td>14</td>
<td>Describe any search peer review process.</td>
</tr>
<tr>
<td>MANAGING RECORDS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total records</td>
<td>15</td>
<td>Document the total number of records identified from each database and other information sources.</td>
</tr>
<tr>
<td>Deduplication</td>
<td>16</td>
<td>Describe the processes and any software used to deduplicate records from multiple database searches and other information sources.</td>
</tr>
</tbody>
</table>
Applying PRISMA (examples)

- We will review some common pitfalls in publications applying PRISMA
- In addition, we will see examples of good reporting
- Evaluating the entire publication is the best way to determine its overall reporting quality
PRISMA
Common pitfalls

2. Methods

2.1. Study design

This study was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [25]. Additionally, the

II. PRISMA-Compliant Research Methodology

Articles on “ERP” are distributed across journals of various disciplines including social sciences, medical and non-medical. The current review uses a PRISMA-based systematic article selection approach (refer to Figure 1(a)). A literature

Search Strategy

This study was conducted according to the key steps required for systematic reviews according to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines [101]. A literature search was conducted using the
PRISMA Guidance materials

- PRISMA only improves the reporting quality of a review
- Authors should consult guidance materials to help conduct their review
This systematic review was conducted according to the recommendations of Cochrane Handbook for Systematic Reviews of Interventions (Higgins et al., 2022) and reported according to the Preferred Reporting Items for Systematic Reviews and Metaanalyses (PRISMA) Statement (Page et al., 2021; see Appendix S1). This study answers the second question of the systematic review protocol registered in the Prospective Register of Ongoing Systematic Reviews (PROSPERO) (registration number PROSPERO 2020 CRD42020206077).

To integrate qualitative and quantitative evidence in this complex research question, a mixed-methods systematic review (MMSR) was conducted. This MMSR was informed by the Joanna Briggs Institute (JBI) methodology for a MMSR (Lizarondo et al., 2020). Results were reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses updated checklist (Page et al., 2021).
Common pitfalls

We conducted systematic literature search according to PRISMA guideline on Cochrane Library, PubMed, Google Scholar, ProQuest, EBSCO and ScienceDirect from 16 until 24 June 2022. Effect of vitamin D supplementation on diabetic foot

Search strategy

Interventions for reducing MOVs (Objective 1). We searched the MEDLINE, EMBASE, CINAHL, and LILACS electronic databases. The original systematic review conducted a search between 1990 and April 2014; we updated the original search strategy, with minor modifications, and ran the search from April 2014 to November 2019. A combination of MeSH and keyword terms on the topics of immunization and missed opportunities for vaccination were used (full search strategy available upon request).

-Literature search strategy
This study was conducted following the PRISMA statements (18). Searching process was carried out by two reviewers (J.J. S-E and S.G-M), with a search for articles in PubMed and SCOPUS electronic databases until 21 October 2021, with no restrictions or limits on language or year.
The following combination of Medical Subject Heading (MeSH) terms and keywords were used: (dens invaginatus OR dens in dente) AND (prevalence or frequency) AND (cone OR CBCT OR tomography).

Results
-Searching strategy
The searching strategy flowchart is shown in Fig. 1. Seven articles were identified after searching the PubMed database. In the screening, there were no duplicate pa-
Better approaches

Develop detailed search strategies for each database. The search was developed for PubMed (NLJ) and was translated to EMBASE (Elsevier), Web of Science (Clarivate Analytics), CINAHL (EBSCOHost) and Cochrane Central (Wiley) using a combination of keywords and subject headings. A grey literature search included ClinicalTrials.gov and the TRIP database. The search included no major limits or date restrictions. The final search was completed on April 27, 2021. The full search details are provided in “Appendix”.

PubMed (NLJ) from inception to 4/27/21 (4914 Results),
EMBASE (Elsevier) from inception to 4/27/21 (3499 Results),
Web of Science (Clarivate Analytics) from inception to 4/27/21 (107 Results).

Appendix

Search criteria for the databases examined

<table>
<thead>
<tr>
<th>PubMed (NLJ)</th>
</tr>
</thead>
</table>
PRISMA
Better approaches

**Literature Search**

A medical librarian with expertise in systematic review methods and searching (C.P.) developed and executed the search after consulting with the research team. The search was developed based on key articles selected by the team. Prior to running the searches in each database, the search was peer-reviewed by a second medical librarian. The search was completed in PubMed through NCBI, Embase through Elsevier, the Cochrane Library on the Wiley Platform, CINAHL Plus through EBSCO, the Web of Science Core Collection, and Scopus through Elsevier, ProQuest Dissertations and Theses Global database, and Open Access Thesis Dissertations as part of the gray literature from database inception to 03/13/2020. An update was completed on

**PubMed**

PRISMA
Take-aways

- Examine the PRISMA E&E publication along with the checklist and flow diagram
- Begin with the PRISMA-P and assemble your team
- Apply the PRISMA 2020 statement and any extension appropriately for reporting your review
- Consult and adhere to guidance materials for conducting/performing your review
Starting a systematic review?

- Search the Prospero registry for published SR protocols on your topic.
- Consult with an information specialist on the protocol, finding guidance materials, selecting information sources, and developing search strategies.
- For Sci-Flow users, an SR protocol template is available.
Thanks for your attendance

Next Coffee Lectures:

Research Support Services
Science and Medical Libraries
University Library Bern
frnat.ub@unibe.ch
support_med.ub@unibe.ch
Thanks for your attendance

Slides and Screencast:

Science Library
Medical Library

Research Support Services
Science and Medical Libraries
University Library Bern
frnat.ub@unibe.ch
support_med.ub@unibe.ch
Thanks for your attendance

Now there is time for...

Questions & Discussion

Research Support Services
Science and Medical Libraries
University Library Bern
frnat.ub@unibe.ch
support_med.ub@unibe.ch