Is there a need for implementation of more specified reporting guidelines for the search process in systematic reviews and meta-analyses?

Linda Östlundh
Director, the National Medical Library, United Arab Emirates, Al Ain
lostlundh@uaeu.ac.ae
Systematic reviews and meta-analyses

❖ The foundation for systematic reviews and meta-analyses:

- a comprehensive, systematic search, with the aim to exhaust all available studies matching a specific research question and pre-set inclusion criteria (Institute of Medicine, 2011; Deeks et al. 2011)

- a transparent and detailed method documentation for reproducible search results (Deeks et al. 2011; Koffel & Rethlefsen, 2016; Institute of Medicine, 2011)

❖ Connection between the quality of the search and the search documentation and the overall quality and risk of bias of SRs and MAs (Golder, Loke, & Zorzela, 2013; Opheim, 2019; Peters et al., 2015; Salvador-Oliván et al. 2019; Rethlefsen et al. 2015)
Reporting guidelines/standards

❖ 1996- The Cochrane Handbook

❖ 2009- PRISMA (Preferred Reporting Items for Systematic Reviews and Meta- analyses)

❖ 2011- IOM (Institute of Medicines Standards for Systematic Reviews)
PRISMA

❖ Preferred or required reporting guidelines for many high impact medical journals (The Lancet, Annals of Internal Medicine, JAMA, BMJ etc.)

❖ General quality improvement of the method and method documentation with PRISMA (Panic, 2013)

❖ Further endorsement of standardize reporting methods like PRISMA and IOM is recommended (Koffel & Rethlefsen, 2016; Peters et al., 2015; Panic et al., 2013)
Current research on reporting standards of search strategies in SRs and MAs

❖ The search in many SRs and MAs are still of poor quality and includes a very high percentage (up to 93%) of search technical errors (Golder, Loke, & Zorzela, 2013; Grossetta et al. 2019; Koffel & Rethlefsen, 2016; Opheim et al. 2019; Rethlefsen et al. 2015; Salvador-Oliván et al. 2019).

❖ Many SRs and MAs lack transparent, re-producible search documentation (up to 92%) which reduces the usefulness of the reviews in evidence-based clinical settings (Golder, Loke, & McIntosh, 2008; Golder, Loke, & Zorzela, 2013; Knehans, Dell & Robinson, 2016; Koffel & Rethlefsen, 2016; Maggio, Tannery & Kanter, 2011; Peters et al. 2015).

❖ A poorly conducted and documented systematic search may lead to serious consequences for clinical decision making (Institute of Medicine, 2011).
The Cochrane Handbook

All searches should be reproducible. A full search strategy for each database should be presented in an appendix.

IOM Standards

“Provide a line-by-line description of the search strategy including the date of every search for each database, web browser etc.” (Standard 3.4., Search documentation)
## The PRISMA Checklist

### METHODS

<table>
<thead>
<tr>
<th>Protocol and registration</th>
<th>Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligibility criteria</td>
<td>Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.</td>
</tr>
<tr>
<td>Information sources</td>
<td>Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.</td>
</tr>
<tr>
<td>Search</td>
<td>Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.</td>
</tr>
</tbody>
</table>

### Example Table

<table>
<thead>
<tr>
<th>Protocol and registration</th>
<th>Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligibility criteria</td>
<td>Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.</td>
</tr>
<tr>
<td>Information sources</td>
<td>Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.</td>
</tr>
<tr>
<td>Search</td>
<td>Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.</td>
</tr>
</tbody>
</table>

---

Moher et al., 2009
### Practical example: search result variations

<table>
<thead>
<tr>
<th></th>
<th>Is the current HbA1c level of 6.5% for diabetes diagnosis too high</th>
<th>Systematic review and meta-analysis on the effect of soy on thyroid function</th>
<th>The association between boarding in the emergency department and in-hospital mortality</th>
<th>Cost-effectiveness of non-surgical weight loss interventions for diabetic obese patients</th>
<th>A systematic review to assess the relationship between sleep duration and mood in adolescents</th>
</tr>
</thead>
<tbody>
<tr>
<td>PubMed result</td>
<td>4916</td>
<td>1501</td>
<td>1451</td>
<td>518</td>
<td>781</td>
</tr>
<tr>
<td>Result from additional databases included</td>
<td>7880</td>
<td>3424</td>
<td>6242</td>
<td>1157</td>
<td>1381</td>
</tr>
<tr>
<td>Total no. of references after de-duplication</td>
<td>9324</td>
<td>1816</td>
<td>4321</td>
<td>1120</td>
<td>1532</td>
</tr>
<tr>
<td>% of total no. of references not covered by PubMed</td>
<td>47.3%</td>
<td>17.3%</td>
<td>66.4%</td>
<td>53.7%</td>
<td>49%</td>
</tr>
</tbody>
</table>
Small mistakes can lead to large variations

- 374 out of 1120 references missed due to the lack of one “OR” operator

```sql
```
Conclusions and limitations

❖ Conclusion
- small variations or errors in the search strategy can have a large impact on the search result
- documenting only one or a few of the included databases has a negative impact on the reproducibility and transparency of the systematic search and hinders the appraisal and risk of bias analysis of the study
- implementation of more specified reporting guidelines for the search process could increase the overall quality and clinical usefulness of SRs and MAs

❖ Limitations
- more research on the quality impact of SRs and MAs only reporting on “at least one” database compared to reviews with comprehensive reporting of the entire search process and all information sources included is needed.
References


Butler, A., Atkins, S., Östlundh, L. (2018), Is the current HbA1c level of 6.5% for diabetes diagnosis too high? [Protocol]. PROSPERO, CRD42018099410


Golder, S., Loke, Y., & McIntosh, H. M. (2008). Poor reporting and inadequate searches were apparent in systematic reviews of adverse effects. Journal of Clinical Epidemiology, 61(5), 440-448. doi:10.1016/j.jclinepi.2007.06.005


References


References


