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LEADING ARTICLE

Reporting of Systematic Reviews in Medical Journals: Points to Ponder

Perera S
Faculty of Medicine, University of Peradeniya, Peradeniya, Sri Lanka

ABSTRACT

Reliance on recent evidence to answer a clinical question is the key element in Evidence Based Medicine (EBM). The practice of EBM involves identifying the best evidence pertaining to a given situation and integrating it with clinical expertise and patient values in making the best decision with regard to the situation[1]. Finding the best evidence can be a difficult task given the proliferation of information generated by individual studies, which may be of different quality in methodology and context[2]. In such a situation, conducting Systematic Reviews is considered the least biased, most logical and scientific approach to find the best evidence for a given scenario. Credibility of the conclusions of a SR depends on the reliability of its methodology and the quality of reporting the systematic review. Authors of SRs are expected to report a complete, accurate and transparent account of the procedure and results. This article focuses on the issues observed in reporting of SRs in medical journals and aims to provide an account on some aspects to consider when reviewing SR articles. A brief account on the methodology, standards and guidelines of the SR process is presented along with the significance of the technicalities of some important steps that need to be followed. SRs generate new knowledge based on already existing findings, aiming at different types of potential users such as policy makers, healthcare providers, patients and researchers[1]. It is important that reviewers strictly adhere to the guidelines and standards in conducting the review and in reporting their work to produce high quality and reliable SRs.

Keywords: Best evidence; evidence-based medicine; reporting of systematic reviews; systematic reviews; systematic review methodology

Corresponding Author: Perera S
sriyanip88@gmail.com
ORCID iD: https://orcid.org/0000-0002-3713-3304

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INTRODUCTION

The principles of Evidence Based Medicine (EBM) can be used to describe the need for development of Systematic Reviews (SRs) in healthcare. Reliance on current and relevant evidence to answer a clinical question is the key element in EBM. It is a process where the best evidence pertaining to a given situation is identified through a systematic search of literature and integrating it with clinical expertise and patient values in deciding the best course of action[1]. Finding the best evidence can be a difficult task given the rapid influx of information generated by individual studies, as they may be of different quality in methodology and context, biased, misrepresented, misinterpreted, and reaching conflicting conclusions[2]. In such a situation, conducting systematic reviews is considered the best, least biased and most logical and scientific approach to finding the best evidence.

Credibility of the conclusions of a SR depends on the reliability of its methodology. The quality of reporting of a systematic review is important as it reflects the quality of the procedure it followed, which eventually would verify the credibility of its conclusions. Researchers are expected to report a complete, accurate and transparent account of the procedure and the results. This article aims to discuss the quality of reporting of SRs in medical

journals and, to provide an account on some considerations to be made to ensure high quality reporting by authors, editors and peer-reviewers of systematic reviews based on the PRISMA (Preferred Reporting Items for Systematic Reviews & Meta-Analysis) 2020 statement[3].

WHAT ARE SYSTEMATIC REVIEWS?

'Systematic review' is defined as "a synthesis that collates all empirical evidence fitting pre-specified eligibility criteria in order to answer a specific research question"[4]. As such SR is a review of literature pertaining to a clearly formulated question, using a set of **systematic and explicit methods** to first **identify, assess and select all relevant studies** for the review, and then to **collect, analyze and synthesize data** from those **selected studies**, with the aim to **present a valid conclusion**, representing the 'best evidence' that can be drawn from the review, in order to answer the question[5]. Meta-analysis may or may not be used to analyze and combine the results of those studies included in the review during the process of its synthesis[6]. A systematic review may be presented as a narrative synthesis or a combination of a narrative synthesis and a meta-analysis. The final product of a SR is the comprehensive summary of the synthesized evidence from the included studies in the form of a report or a journal article.

The process of conducting SRs adheres to a **strict**, **explicit**, **reproducible, and pre-specified** methodology[2]. The core principles of SR methodology are the scientific rigor, transparency and replicability[7]. Conducting a systematic review is a time-consuming exercise, requiring a carefully thought-out research question, a review protocol (the pre-plan), a wide range of resources and the commitment of a team of reviewers for its successful completion. Systematic reviews are conducted according to a pre-plan which is explicitly documented in the form of a Review Protocol.

The SR procedure involves the following stages for which **technical details are available through guidelines and standards**:

PHASE 1

1. Assess need, assemble team, define research question
2. Define 'study inclusion criteria', create review protocol (Pre- plan)

PHASE 2

3. Conduct Review - Strictly follow the protocol
   - Identify search terms; outline the search strategy
   - Search literature: strive to locate <u>all</u> relevant studies (articles), manage references
   - Screen through relevant articles using the 'study inclusion criteria'; select studies for the review
   - Assess selected studies for quality; identify studies of acceptable quality for inclusion in the review
   - Extract data from included studies
   - Analyze extracted data (qualitative / quantitative)
   - Update the search towards end of review, to locate/include any current studies
   - Synthesize findings of included studies (narrative synthesis and/or Meta-analysis)
   - Discuss; describe results, archive review data, materials

PHASE 3

4. Write report of the review and disseminate findings
5. Update the review as needed (if new research findings are not included SR would be out of date)

Systematic reviews differ from normal reviews in the following aspects, in that SRs

i) adhere to a protocol
ii) locate ALL relevant evidence using a comprehensive search strategy that avoids bias
iii) screen all relevant studies using 'study inclusion criteria'
iv) exclude studies of poor quality and use findings from only the studies of good quality

The reliability of the findings of a SR depends entirely on adherence to the methodology. For example, the literature search is a crucial component of a systematic review as it is the underling process that defines all subsequent steps of the SR procedure. The search process of identifying evidence pertaining to the research question should be reproducible, deploying a thorough and comprehensive search strategy. In addition, the quality (internal and external validity) of included studies determines the reliability of the evidence derived through a systematic review. This necessitates quality appraisal of included studies to select only the studies of acceptable quality for inclusion in the review.

STANDARDS AND GUIDELINES FOR SYSTEMATIC REVIEWS

Various institutes and organizations have collectively established comprehensive guidelines for conducting SRs in healthcare. These guidelines / standards aim to guide the researchers through all stages of the SR process. CRD Guidance (Cochrane Reviews & Dissemination handbook)[2] and IOM (Institute of Medicine) standards[8] are two examples. PRISMA 2020 checklist provides the guidelines for reporting of systematic reviews.

In undertaking a SR, IOM standards recommends a team of researchers with expertise covering each aspect of the SR process; methodology, literature search, data management, subject specialty, and data analysis if a meta-analysis is planned. Reviewers are expected to rigorously adhere to all technicalities in each step of the SR procedure in order to minimize all possible system errors and, also to avoid potential bias[9]. The minimum number of reviewers to be involved, methods for independent evaluation at each phase, resolving disagreements, and tools/techniques to be used etc. are well documented in the guidelines.

Creating a review protocol at the initial stage of the process is vitally important for which guidance is provided through PRISMA-P 2015[10]. The review protocol ensures that the SR is well planned and the methods to be used are documented and it promotes consistent conduct by the review team throughout the SR process. While, PRISMA-P 2015 helps reviewers to create a high quality review protocol, it has potential to improve the conduct of the systematic reviews as well[10]. Review authors are expected to comply with all 17 items specified by PRISMA-P 2015 in creating the protocol. These items are categorized into three sections: administrative information, introduction, and methods. The search strategy is an integral element that should be included in the methods section of the review protocol.

It is recommended that the review protocol is registered in a Protocol Registry: the PROSPERO (International prospective register of systematic reviews) at an early stage of the process. Purpose of prospective registration is to prevent unintended duplication of reviews, reduce bias in the conduct and promote transparency.

IOM standards specifies the methods for literature searching and recommends use of a reference management system software (examples: Mendeley, EndNote) for managing the articles that will be retrieved. The details of the searching process should be documented including databases, citation indexes, grey-literature, and other sources to be searched; methods of hand-searching; cited and citing references of included studies and a line-by-line description of the search strategy with the date of search for each database. The search strategy involves translation of the research question into search concepts using a 'Search-term Harvesting Table', correct choice of Boolean operators, using relevant subject headings, spelling variants and truncation, and translation of the search strategy for each database. Contacting the authors of the relevant studies is recommended in case of any required clarification of data of included studies.

It is essential that guidelines for conduct of literature search and reporting searches, are followed. Guidance for reporting the search process is provided by *PRISMA-S*[11], in the form of a checklist of 16 items, covering all aspects of the search process. It requires reporting of search strategies for all the databases that were searched, copied, and pasted exactly as the searches were run. This ensures the transparency and reproducibility of the systematic review.

CRD guidance and IOM standards specify the norms for the study screening process, including inclusion/exclusion criteria. The Web application Rayyan[12] is a useful software designed to facilitate the screening process of articles in SRs. The study selection process should be documented with details, including the reasons for exclusion of potentially relevant studies. PRISMA- Flow diagram is the standard format for reporting the study selection process.

The most convenient method of assessing quality of included studies is to use validated checklists that are designed for the purpose. Various tools are available for this and there is no single tool that is suitable for use in all reviews. Choice of the checklist should be guided by the study design of the study that is concerned. Following are a few examples of commonly used instruments:

- The Cochrane Collaboration's tool for assessing risk of bias in randomized trials in health sciences[13]
- The Newcastle-Ottawa Scale (NOS) for assessing the quality of non-randomized studies in meta-analyses[14]
- The Joanna Briggs Institute Critical Appraisal tools for use in JBI Systematic Reviews[15]

- Downs and Black Scale for randomized and non-randomized studies[16]

REPORTING OF SRs IN HEALTH/MEDICAL JOURNALS

Many SRs published as journal articles, represent SRs of high quality. However, it is evident that certain systematic reviews published in journals are questionable in their quality with regard to methodology and reporting. Most of the time reviewers tend to report normal reviews as systematic reviews using the terminology of SRs. In such reporting, some authors have used the expected SR terminology to list the entire PRISMA checklist items claiming to have conducted during the review, but without providing proof for the actual conduct of the listed processes. At a glance such a SR article would be portrayed as a properly conducted SR and thereby mislead the readers. The conclusions presented by such systematic reviews cannot be accepted as reliable evidence for purposes of decision making. Peer-reviewers of such SR articles should be able to identify the missing points in the reporting and to verify if a proper SR has been conducted or not. In the peer-review process, it is important to read through the article carefully to check, if it presents sufficient clues for following the recommended guidelines based on PRISMA 2020 checklist during each step. Paying attention to the following would be useful when reviewing SR articles submitted for health/medical journals:

1. **Submission guidelines (of journals)** for SR articles should include the need to provide (i) annexures of supplementary documents supporting the content reported in the article (ii) the search strategy (iii) review protocol (iv) PRISMA-2020 checklist sheet, (v) PRISMA-Flow diagram for study selection (vi) quality assessment reports etc..
2. **Peer- reviewers** are expected to check on (i) documents in determining the credibility of the reported SR (ii) measures taken to avoid risks of bias and system errors in the process (iii) reproducibility of the search strategy as PRISMA-S guidelines recommend reporting the details of search strategies for all databases (iv) whether methods reported in the article is comparable with what was planned in the protocol. This helps peer-reviewers verify the levels of potential risks of bias if there are any.

CONCLUSION

Significance of the technicalities of each step of the SR process has been well documented. It is not possible to present a comprehensive account on these processes in this article due to its enormity. Systematic reviews generate new knowledge based on already existing observations and findings that may be of benefit to a wide range of users such as policy makers, healthcare providers, patients and researchers[1]. It is mandatory that such conclusions/findings are adequately justified and without bias. Therefore, researchers should strictly adhere to the guidelines and standards, first in conducting the review, and then in reporting their work, with commitment to uphold desired standards of quality SRs. Such SRs would provide credible accounts on the issues of interest to all relevant stakeholders.

CONFLICTS OF INTEREST

There are no conflicts of interest.

DISCLOSURE

SP is an editorial board member of Sri Lanka Journal of Forensic Medicine, Science & Law. Therefore did not participate in any way in the publication / decision making process of this submission, as per journal policy.

ETHICAL ISSUES

None

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REFERENCES

1. Masic I, Miokovic M, Muhamedagic B. Evidence Based Medicine - New Approaches and Challenges. *Acta Inform Medica*. 2008;16(4): 219. https://doi.org/10.5455/aim.2008.16.219-225.
2. Centre for Reviews and Dissemination University of York. *Systematic Reviews: CRD's guidance for undertaking reviews in health care*. CRD, University of York; 2009. Available from: https://www.york.ac.uk/media/crd/Systematic_Reviews.pdf.
3. Page MJ, McKenzie JE, Bossuyt PM, *et al*. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*. 2021;372: 2020–1. https://doi.org/10.1186/s13643-021-01626-4.
4. Institut National d"Excellence en Santé et en Services Sociaux (INESSS). *HTA Glossary*. Available from http://htaglossary.net/HomePage.
5. Glasziou P, Irwig L, Bain C, Colditz G. *Systematic Reviews in Health Care : A Practical Guide*. Cambridge: Cambridge University Press; 2001.

6. Higgins JPT, Green S. *Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0*. 2011.
7. Mallett R, Hagen-Zanker J, Slater R, Duvendack M. The benefits and challenges of using systematic reviews in international development research. *Journal of Development Effectiveness*. 2012;4(3): 445–55. https://doi.org/10.1080/19439342.2012.711342.
8. Petticrew M, Roberts H. *Systematic Reviews in the Social Sciences: A Practical Guide*. 2008. 1–336.
9. Eden J, Levit L, Berg A, Morton S. (eds.) *Finding What Works in Health Care: Standards for Systematic Reviews*. Washington (DC): National Academies Press (US); 2011. https://doi.org/10.17226/13059.
10. Moher D, Shamseer L, Clarke M, *et al*. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews*. 2015;4:1(January): 1–9. https://doi.org/10.1186/2046-4053-4-1.
11. Rethlefsen ML, Kirtley S, Waffenschmidt S, *et al*. PRISMA-S: An extension to the PRISMA statement for reporting literature searches in systematic reviews. *Journal of the Medical Library Association*. 2021;109(2): 174–200. https://doi.org/10.5195/jmla.2021.962.
12. Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan-a web and mobile app for systematic reviews. *Systematic Reviews*. 2016;5(1): 1–10. http://dx.doi.org/10.1186/s13643-016-0384-4.
13. Higgins JPT, Altman DG, Gøtzsche PC, *et al*. The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. *BMJ*. 2011;343(7829):1–9. https://doi.org/10.1136/bmj.d5928.
14. Wells G, Shea B, O'Connell D, *et al*. *The Newcastle-Ottawa Scale (NOS) for assessing the quality if nonrandomized studies in meta-analyses*. 2012. Available from: http://www.ohri.ca/programs/clinical_epidemiology/oxford.asp.
15. The Joanna Briggs Institute. *Joanna Briggs Institute Reviewers' Manual: 2014 edition / Supplement*. University of Adelaide; 2014. Available from: https://nursing.lsuhsc.edu/JBI/docs/ReviewersManuals/Economic.pdf.
16. Downs SH, Black N. The feasibility of creating a checklist for the assessment of the methodological quality both of randomised and non-randomised studies of health care interventions. *Journal of Epidemiology & Community Health*. 1998;52(6): 377–84. http://dx.doi.org/10.1136/jech.52.6.377.