Journal of Digital Imaging (2019) 32:199–200
https://doi.org/10.1007/s10278-018-00176-x

EDITORIAL

Writing Systematic Reviews of the Literature—It Really Is a Systematic Process!

Elizabeth A. Krupinski [1]

Published online: 31 January 2019
© Society for Imaging Informatics in Medicine 2019

Keywords Systematic reviews

Editorial

Systematic reviews of the literature represent a very specific type of research paper. Before writing such a review and submitting to a journal, one should consider the rationale for the review and who the audience is. A good definition of a systematic review is one that "attempts to identify, appraise, and synthesize all the empirical evidence that meets prespecified eligibility criteria to answer a given research question. Researchers conducting systematic reviews use explicit methods aimed at minimizing bias, in order to produce more reliable findings that can be used to inform decision making" [1]. Reasons for conducting a systematic review include, but are not limited to determining the extent to which current research has progressed towards addressing a specific problem or area of inquiry; identifying gaps, contradictions, relationships and inconsistencies in the literature; developing an overarching abstraction of the evidence to date; describing directions for future research; and summarizing policy and/or practice implications.

Although not required, it is highly recommended that when contemplating conducting a systematic review of the literature, formal guidelines be followed. The most commonly used is the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline [2–4]. The PRISMA checklist actually provides an outline of what a review paper should look like from title through a funding statement, and for each item provides a brief description. For example, under methods, it includes items to include such as study eligibility criteria, search strategy, and summary measures considered. Moher et al. [3] provide a much more in-depth explanation of exactly how each element in the review paper should be carried out and reported. The PRISMA Flow Diagram (to be used when publishing a review) provides readers with a visual that shows how many articles were initially identified and how many were finally included in the review after screening and assessing eligibility criteria.

Every good review of the literature not only includes a brief description of the studies included, but also some assessment of the quality of the study. This could be as simple as a summary of the key strengths and weaknesses, or it could be a more formal scoring of the quality of the studies (which is preferred). Some of the more commonly used tools include (1) the STROBE guidelines for observational studies [5, 6], (2) the Newcastle-Ottawa Scale (NOS) for nonrandomized studies [7], (3) the NIH Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies [8], (4) Cochrane's Risk of Bias in Non-Randomized Studies of Interventions (ROBINS-I) [9], and (5) Cochrane's Risk of Bias in Randomized Studies of Interventions (RoB 2.0) [10]

One thing in particular to consider when deciding to whether or not conduct a systematic review is have there been any others published on the topic and if so when was the last one. Although there are no strict rules, clearly, the decision should consider how much new evidence has been published since the latest review, and Garner et al. provide clear guidance and a checklist of additional items to consider [11].

What are the benefits for following these types of guidelines and using formal methods to score the quality and potential sources of bias in studies? Perhaps the best reason is that it will improve the quality of your review, enhancing the probability of a good review and subsequent publication. More often than not today, reviewers are coming to expect systematic reviews to follow the PRISMA guidelines. On a practical note, following the guidelines provides an immediate foundation (outline) for writing the review once the literature

✉ Elizabeth A. Krupinski
ekrupin@emory.edu

[1] Department of Radiology & Imaging Sciences, Emory University, 1364 Clifton Rd NE, Atlanta, GA 30322, USA

search and evaluation have been completed. This is especially useful for those writing such a review for the first time. It should be noted that although a thesis or dissertation might very use the PRISMA guidelines, they rarely do. Hence, simply taking the literature review from a thesis or dissertation and trying to publish it without attempting a more formal presentation is rarely successful.

Therefore, in order to improve the quality of systematic literature reviews submitted to the *Journal of Digital Imaging,* we strongly recommend authors to follow an established review guideline and use one of the study quality scoring guides.

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

References

1. Cochrane Handbook for Systematic Reviews of Interventions. http://training.cochrane.org/handbook. Last accessed December 27, 2017.
2. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline. http://www.prisma-statement.org/. Last accessed December 27, 2017.
3. Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group: The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. PLoS Med 6(7):e1000100, 2009
4. Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group: Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. PLos Med 6(7):e1000097, 2009
5. da Costa BR, Cevallos M, Altman DG, Rutjes AW, Egger M: Uses and misuses of the STROBE statement: bibliographic study. BMJ open 1(1):e000048, 2011
6. STROBE: Strengthening the Reporting of Observational Studies in Epidemiology. https://www.strobe-statement.org/index.php?id=strobe-home. Last accessed December 27, 2017.
7. Wells GA, Shea B, O'Connell D, Peterson J, Welch V, Losos M, Tugwell P: The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomised studies in meta-analyses. http://www.ohri.ca/programs/clinical_epidemiology/oxford.asp. Last accessed December 27, 2017.
8. NIH Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies: http://www.nhlbi.nih.gov/health-pro/guidelines/in-develop/cardiovascular-risk-reduction/tools/cohort. Last accessed December 27, 2017.
9. Cochrane's Risk of Bias in Non-Randomized Studies of Interventions (ROBINS-I). http://methods.cochrane.org/bias/risk-bias-non-randomized-studies-interventions. Last accessed December 27, 2017.
10. Cochrane's Risk of Bias in Randomized Studies of Interventions (RoB 2.0). http://training.cochrane.org/resource/rob-20-webinar. Last accessed December 27, 2017.
11. Garner P, Hopewell S, Chandler J, MacLehose H, Schunemann HJ, Aki EA et al.: When and how to update systematic reviews: consensus and checklist. Br Med J 354:i3507, 2016