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MEDICINE,
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Theme #1: How standards and guidance can help authors of systematic reviews

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GROUP OF EIGHT AUSTRALIA

Outline

Reporting guidelines for systematic reviews

Endorsement versus enforcement of standards

Conduct standards for systematic reviews

Summary

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Reporting guidelines of systematic reviews

Reporting guidance for SRs

Reporting guidelines provide guidance for authors on what to report in a scientific paper

Developed based on evidence and consensus

~neutral with regards to which methods to use (emphasis is on reporting whatever was done)

The PRISMA 2009 Statement

OPEN ACCESS Freely available online

PLoS MEDICINE

Guidelines and Guidance

Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement

David Moher[1,2]*, Alessandro Liberati[3,4], Jennifer Tetzlaff[1], Douglas G. Altman[5], The PRISMA Group[¶]

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27-item checklist of minimum reporting standards

Published June 2009 in multiple medical journals

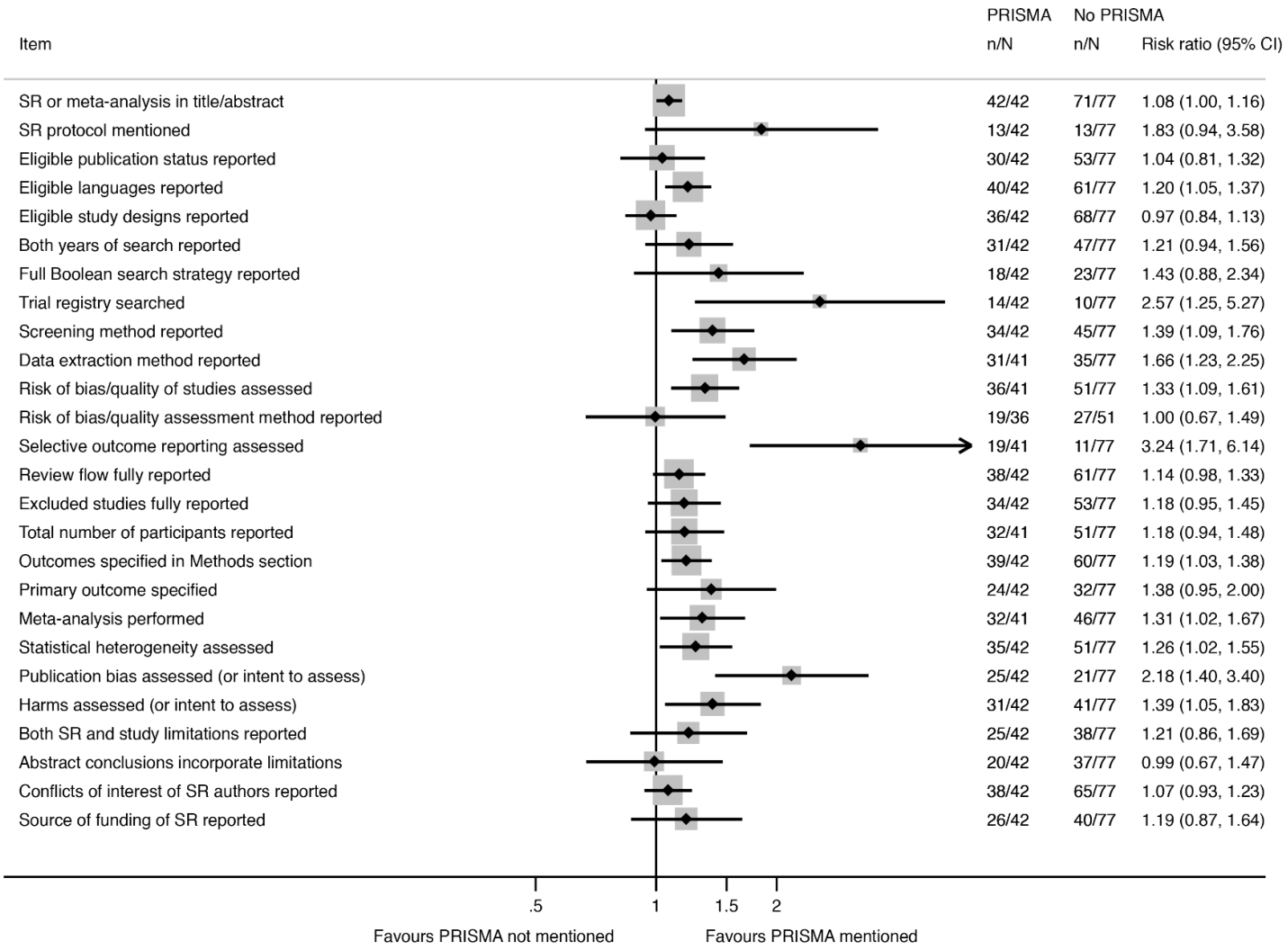
Cited >40,000 times

Endorsed by 180 journals and editorial organisations

Reporting guidance for SRs

- Page et al. (unpublished) selective review of reporting guidance documents
  - 55 identified (incl. PRISMA and its extensions, MECIR, MARS, ROSES)
- Collated >200 unique reporting items
- Informing update of PRISMA 2009

Impact of PRISMA on reporting of SRs (Page 2016 PLoS Med)



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Endorsement versus enforcement of reporting guidelines

Endorsement vs Enforcement

Endorsement: Action taken by a journal to indicate its support for the use of one or more reporting guideline(s) by submitting authors

Enforcement: Mandatory requirement that submitting authors adhere to the reporting guideline(s)

Endorsement: suggested text to include in author instructions

"[journal name] requires a completed PRISMA checklist and flow diagram as a condition of submission when reporting findings from a systematic review or meta-analysis. Templates for these can be found here or on the PRISMA website (http://www.prisma-statement.org) which also describes several PRISMA checklist extensions for different designs and types of data beyond conventional systematic reviews evaluating randomized trials. At minimum, your article should report the content addressed by each item of the checklist. Meeting these basic reporting requirements will greatly improve the value of your review and may enhance its chances for eventual publication."

Evidence of impact of endorsement

Page & Moher 2017 SystRev

- 6 studies have evaluated whether reporting is clearer in journals that ‘recommend’ or ‘encourage’ use of the PRISMA

- 2 studies have evaluated whether reporting is clearer in journals that ask authors to submit a PRISMA checklist when submitting an SR

Impact of passive strategies is underwhelming

Strategies to increase adherence to reporting guidelines

Blanco et al. BMJ Open 2019;9:e026589

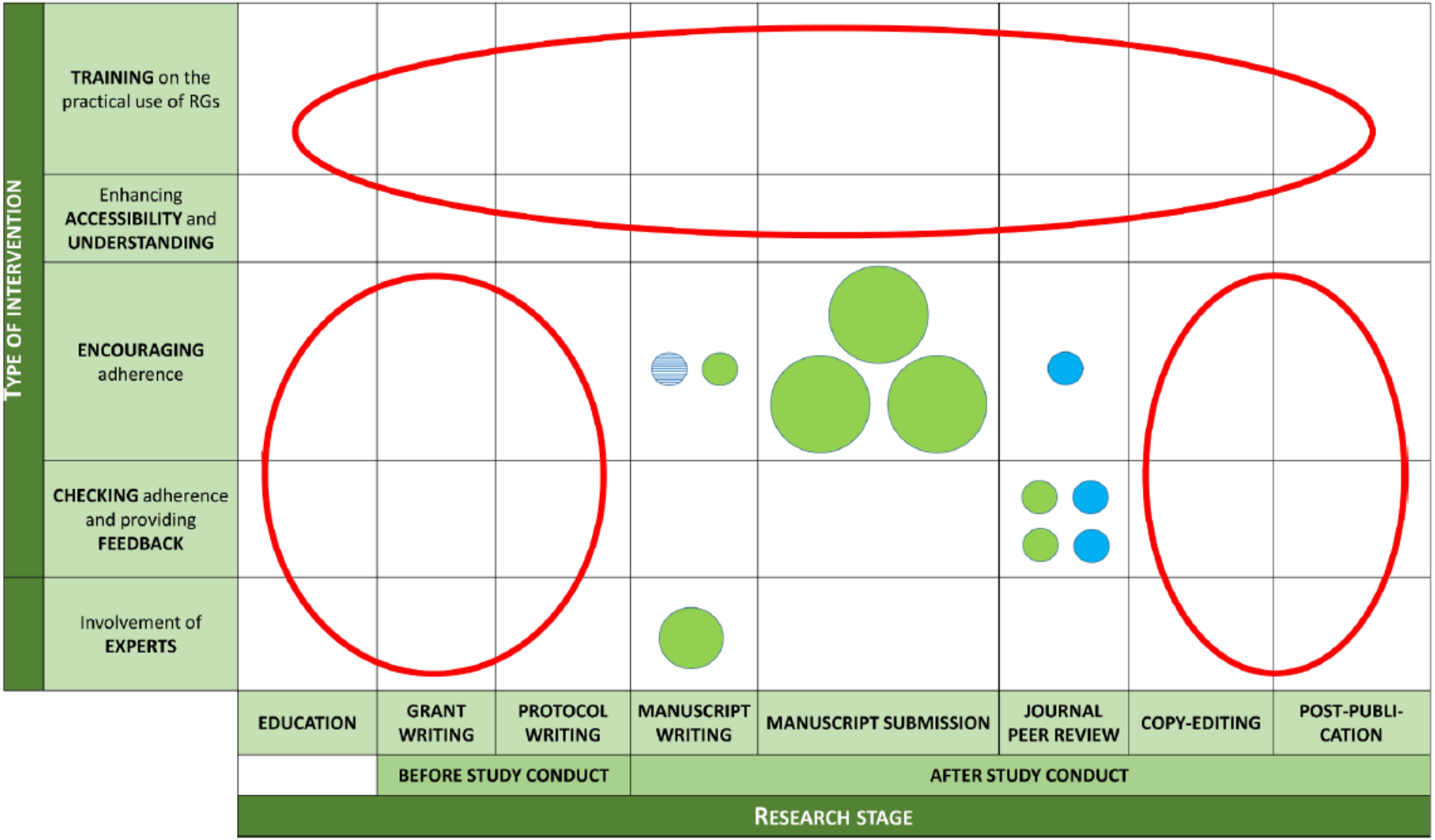
1. Training in the practical use of reporting guidelines
2. Enhancing accessibility and understanding
3. Encouraging adherence
4. Checking adherence and providing feedback
5. Involvement of experts

Strategies to increase adherence to reporting guidelines

TYPE OF INTERVENTION	EDUCATION	GRANT WRITING	PROTOCOL WRITING	MANUSCRIPT WRITING	MANUSCRIPT SUBMISSION	JOURNAL PEER REVIEW	COPY-EDITING	POST-PUBLICATION
TRAINING on the practical use of RGs	Introduction of RGs & journalology into graduate curricula (18-22) Student's development of research protocols using RGs (21)		Funder's support of author training on RGs (23)			Training for peer reviewers and editors on RGs by journals (22,23)		
Enhancing **ACCESSIBILITY** and **UNDERSTANDING**	Dissemination of RGs by scientific associations (24) Translation of RGs to further languages (25) Development of expanded databases of examples for each RG (26)							
ENCOURAGING adherence		Author use of RGs as a template for grant applications' proposals (21)	Required checklist for ethics approval application (11)	**Author use of the writing aid tool COBWEB (12)** **Author use of a structured approach for reporting research (47,112)** Author markup of the manuscript to indicate where each RG item is addressed (109) Funder's requirement of checklists in author's report (21,108)	**Editorial statement endorsing certain RGs (27–46,48–106,113)** **Recommendation or requirement to follow RGs in the "Instructions to authors" (27–46,48–106,113)** **Requirement to submit a RG checklist together with the manuscript indicating page numbers corresponding to each item (27–46,48–106,113)** Journal development of core versions of RGs containing key items (110) Guidance to authors on manuscript preparation by publication officers (111) Requirement to populate and submit a RG checklist with text from the manuscript (114)	**Suggestion for peer reviewers to use RGs (107)** Editor's questions to peer reviewers about whether the authors have followed RGs (115)		
CHECKING adherence and providing **FEEDBACK**						**Completeness of reporting check by editors (117)** **Peer review against RGs (118)** Internal peer review against RGs by a trained editorial assistant (120) Implementation of the automatic tool Statreviewer (121) **Email to authors to revise the manuscript according to RGs (13)** **Implementation of the web tool WebCONSORT (119)**	Completeness of reporting check at copy-editing (122)	Post-publication peer review (123)
Involvement of **EXPERTS**			**Statistician involvement (78,128-130)**	Medical writer involvement (108)				
		BEFORE STUDY CONDUCT		AFTER STUDY CONDUCT				
RESEARCH STAGE								

Blanco et al. BMJ Open 2019;9:e026589

Strategies to increase adherence to reporting guidelines

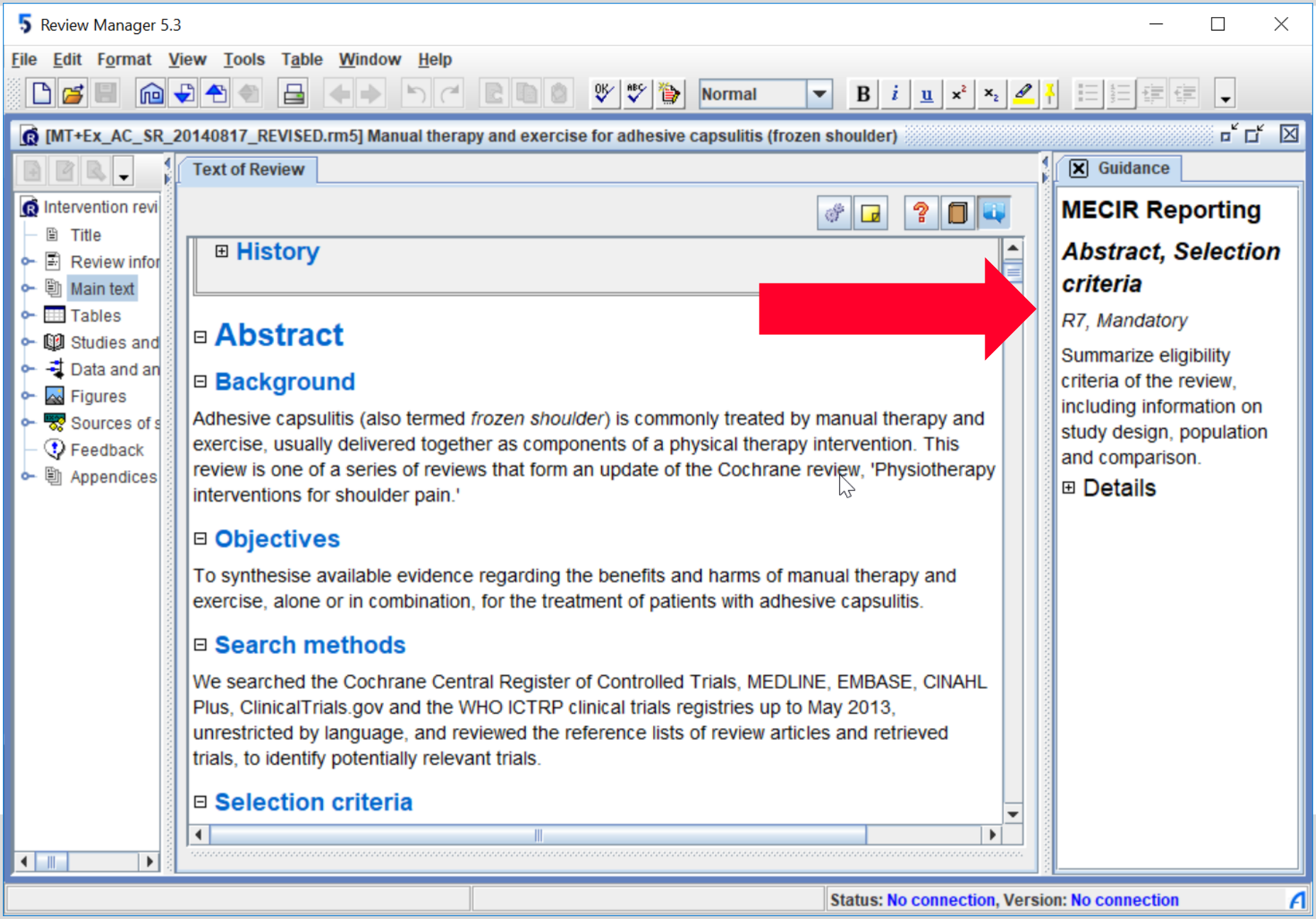


Blanco et al. BMJ Open 2019;9:e026589

Strategies to increase adherence to reporting guidelines

- Managing editors check each submitted SR against MECIR reporting standards
- Cochrane Editorial and Methods Department screen each SR pre-publication against ‘critical’ MECIR standards

Strategies to increase adherence to reporting guidelines



Strategies to increase adherence to reporting guidelines

Barnes *et al. BMC Medicine* (2015) 13:221
DOI 10.1186/s12916-015-0460-y

BMC Medicine

RESEARCH ARTICLE Open Access

CrossMark

Impact of an online writing aid tool for writing a randomized trial report: the COBWEB (Consort-based WEB tool) randomized controlled trial

Caroline Barnes[2,3], Isabelle Boutron[1,2,3*], Bruno Giraudeau[3,4], Raphael Porcher[1,2,3], Douglas G Altman[5] and Philippe Ravaud[1,2,3,6]

- Online writing tool detailing all key elements of a reporting guideline
- Led to improved reporting by medical students

Strategies to increase adherence to reporting guidelines

Outcomes

Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed

Please provide a detailed description of the primary outcome(s), by describing:

- The variable of interest (ie pain, quality of life, clinical improvement, clinical event, other)
- How the variable was defined (ie proportion of pain scores over 7, average quality of life score, change in blood pressure, number of myocardial infarctions, other)
- How the variable was measured (ie visual analog scale, SF-36, systolic blood pressure, according to the WHO diagnostic criteria, other)
- The overall time frame indicating pre-specified time point(s) (difference from baseline to 3 months; average over 1 year (at baseline, 6, and 12 months); final values at 1 month; time to event within 30 days; time to event or pre-specified final day of follow-up [indicate date]; other)
- Who assessed the outcome (the patient, doctor, nurse, caretaker, other)
- If any special skills or training were required for the outcome assessment

❒ Information not available_____

Example 1. "The primary endpoint with respect to efficacy in psoriasis was the proportion of patients achieving a 75% improvement in psoriasis activity from baseline to 12 weeks as measured by the PASI [psoriasis area and severity index]."

Barnes et al. BMC Med 2015;13:221

Strategies to increase adherence to reporting guidelines

Machine learning tools for journals to check submitted manuscripts automatically for missing information

- https://www.penelope.ai/
- http://www.statreviewer.com/

Limitations of reporting guidelines

Adherence to reporting guidelines does not guarantee that methods used were rigorous

METHODS USED	REPORTING	CONDUCT
“We searched 1 database”	✓	✗
“1 author screened records”	✓	✗
“We used the Jadad scale to assess quality of trials”	✓	✗

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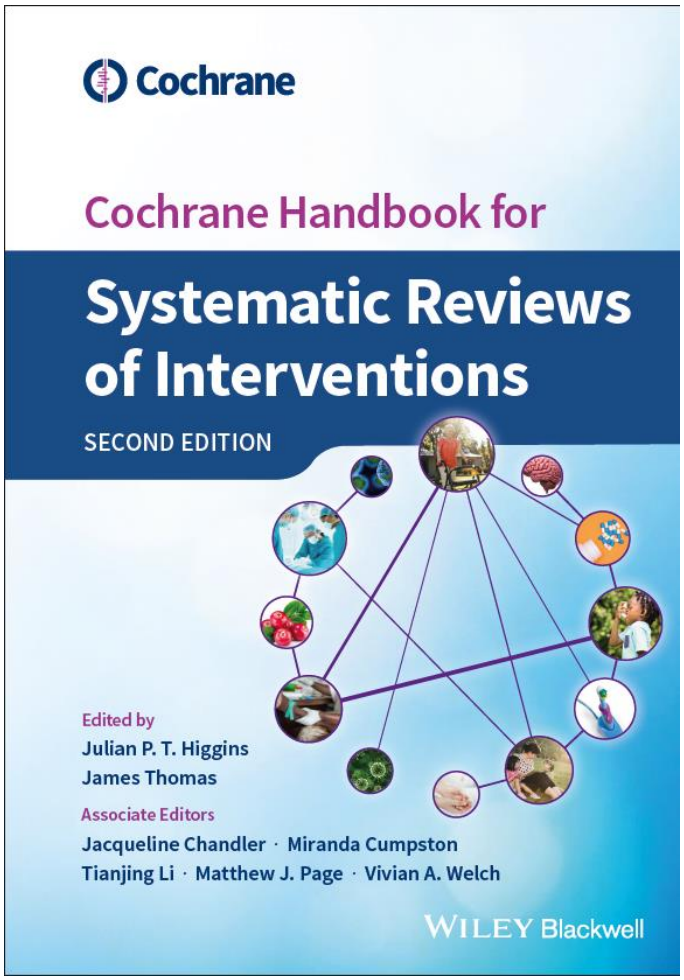
Conduct guidelines of systematic reviews

Conduct guidelines

Conduct guidelines provide guidance on best practices for systematic reviews

- MECIR (Cochrane)
- Institute of Medicine's 2011 Standards for Systematic Reviews
- Navigation Guide Systematic Review Methodology
- Office of Health Assessment and Translation (OHAT) Systematic Review Handbook

Strategies to increase adherence to conduct guidelines



Strategies to increase adherence to conduct guidelines

effect in the highly specific population on which it is based. Factors influencing the applicability of an included study to the review question are covered in Chapter 14 and Chapter 15.

7.1.2 From quality scales to domain-based tools

Critical assessment of included studies has long been an important component of a systematic review or meta-analysis, and methods have evolved greatly over time. Early appraisal tools were structured as quality 'scales', which combined information on several features into a single score. However, this approach was questioned after it was revealed that the type of quality scale used could significantly influence the interpretation of the meta-analysis results (Jüni et al 1999). That is, risk ratios of trials deemed 'high quality' by some scales suggested that the experimental intervention was superior, whereas when trials were deemed 'high quality' by other scales, the opposite was the case. The lack of a theoretical framework underlying the concept of 'quality' assessed by these scales resulted in tools mixing different concepts such as risk of bias, imprecision, relevance, applicability, ethics, and completeness of reporting. Furthermore, the summary score combining these components is difficult to interpret (Jüni et al 2001).

In 2008, Cochrane released the Cochrane Risk of Bias (RoB) tool, which was slightly revised in 2011 (Higgins et al 2011). The tool was built on the following key principles.

1) The tool focused on a single concept: risk of bias. It did not consider other concepts such as the quality of reporting, precision (the extent to which results are free of random errors), or external validity (directness, applicability or generalizability).
2) The tool was based on a domain-based (or component) approach, in which different types of bias are considered in turn. Users were asked to assess seven domains: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective outcome reporting, and other sources of bias. There was no scoring system in the tool.
3) The domains were selected to characterize mechanisms through which bias may be introduced into a trial, based on a combination of theoretical considerations and empirical evidence.
4) The assessment of risk of bias required judgement and should thus be completely transparent. Review authors provided a judgement for each domain, rated as 'low', 'high' or 'unclear' risk of bias, and provided reasons to support their judgement.

This tool has been implemented widely both in Cochrane Reviews and non-Cochrane reviews (Jorgensen et al 2016). However, user testing has raised some concerns related to the modest inter-rater reliability of some domains (Hartling et al 2013), the need to rethink the theoretical background of the 'selective outcome reporting' domain (Page and Higgins 2016), the misuse of the 'other sources of bias' domain (Jorgensen et al 2016), and the lack of appropriate consideration of the risk-of-bias assessment in the analyses and interpretation of results (Hopewell S et al 2013).

To address these concerns, a new version of the Cochrane risk-of-bias tool, called RoB 2, has been developed. The tool, described in Chapter 8, includes important innovations in the assessment of risk of bias in randomized trials. The structure of the tool is similar to that of the ROBINS-I tool for non-randomized studies of interventions (described in Chapter 25). Both tools include a fixed set of bias domains, which are intended to cover all issues that might lead to a risk of bias. To reach risk-of-bias judgements, a series of 'signalling questions' are included within each domain. Also, the assessment is typically specific to a particular result. This is because the risk of bias may differ depending on how an outcome is measured and how the data for the outcome are analysed. For example, if two analyses for a single outcome are presented, one adjusted for baseline prognostic factors and the other not, then the risk of bias in the two results may be different. The risk of bias in at least one specific result for each included study should be assessed in all Cochrane Reviews (MECIR Box 7.1).

MECIR Box 7.1. *Relevant expectations for conduct of intervention reviews*

C52: Assessing risk of bias (Mandatory)	
Assess the risk of bias in at least one specific result for each included study. For randomized trials, the RoB 2 tool should be used, involving judgements and support for those judgements across a series of domains of bias, as described in this Handbook.	*The risk of bias in at least one specific result for every included study must be explicitly considered to determine the extent to which its findings can be believed, noting that risks of bias might vary by result. Recommendations for assessing bias in randomized studies included in Cochrane Reviews are now well established. The RoB 2 tool – as described in this Handbook – must be used for all randomized trials in new reviews and all newly included randomized trials in updated reviews. This does not prevent other tools being used.*

7.2 Empirical evidence of bias

Where possible, assessments of risk of bias in a systematic review should be informed by evidence. The following sections summarize some of the key evidence about bias that informs our guidance on risk-of-bias assessments in Cochrane Reviews.

7.2.1 Empirical evidence of bias in randomized trials: meta-epidemiological studies

Many empirical studies have shown that methodological features of the design, conduct and reporting of studies are associated with biased intervention effect estimates. This evidence is mainly based on meta-epidemiologic studies using a large collection of meta-analyses to investigate the association between a reported methodological characteristic and intervention

Strategies to increase adherence to conduct guidelines

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Common Errors: A resource for Cochrane Editors

COMMON ERRORS is a suite of five learning modules for Cochrane Editors to enhance their editorial skills. The modules are designed to help Editors learn to recognise and address many of the common errors that occur as Cochrane reviews are carried out.

Access the modules

The resource consists of four learning modules and an exercise module.

Click on the links below to open the individual Common Errors modules [these open in a new browser window].

1. **Inconsistency and inaccuracy**
2. **GRADE and interpretation of findings**

Strategies to increase adherence to conduct guidelines

Course comprises nine modules, providing over 10 hours of self-directed learning on the complete systematic review process for both new and experienced review authors interactivelearning.cochrane.org

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Summary

Summary

Various reporting and conduct standards available

Various strategies available to increase adherence to standards

Passive strategies (e.g. journal endorsement) likely to have little impact

Need more research on impact and feasibility of more intensive strategies