Journal of Clinical Epidemiology 67 (2014) 754−759

Journal of Clinical Epidemiology

Systematic reviews published in higher impact clinical journals were of higher quality

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Accepted 10 January 2014; Published online 5 April 2014

Abstract

Objectives: To compare the methodological quality of systematic reviews (SRs) published in high- and low−impact factor (IF) Core Clinical Journals. In addition, we aimed to record the implementation of aspects of reporting, including Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) flow diagram, reasons for study exclusion, and use of recommendations for interventions such as Grading of Recommendations Assessment, Development and Evaluation (GRADE).

Study Design and Setting: We searched PubMed for systematic reviews published in Core Clinical Journals between July 1 and December 31, 2012. We evaluated the methodological quality using the Assessment of Multiple Systematic Reviews (AMSTAR) tool.

Results: Over the 6-month period, 327 interventional systematic reviews were identified with a mean AMSTAR score of 63.3% (standard deviation, 17.1%), when converted to a percentage scale. We identified deficiencies in relation to a number of quality criteria including delineation of excluded studies and assessment of publication bias. We found that SRs published in higher impact journals were undertaken more rigorously with higher percentage AMSTAR scores (per IF unit: $\beta = 0.68\%$; 95% confidence interval: 0.32, 1.04; $P < 0.001$), a discrepancy likely to be particularly relevant when differences in IF are large.

Conclusion: Methodological quality of SRs appears to be better in higher impact journals. The overall quality of SRs published in many Core Clinical Journals remains suboptimal.

Keywords: Review; Methodological quality; AMSTAR; Impact factor; Systematic; Meta-analysis

1. Introduction

A systematic review (SR) is ‘‘prepared using a systematic approach to minimizing biases and random errors, which are documented in a materials and methods section’’ [1]. Bias can compromise the narrative review process for a variety of reasons including incomplete identification of published and unpublished research, subjective decisions to include or exclude studies, failure to objectively appraise the strength of the included studies, and by subjective synthesis of the results of those primary studies [2]. The SR has become an established cornerstone of evidence-based health care, facilitating critical appraisal and synthesis of evidence relating to a particular problem in a relatively robust and balanced manner.

The primacy of SRs places a premium on quality as methodological deficiencies may produce misleading results and amplify or exaggerate effect estimates to the ultimate detriment of clinical care. A number of validated tools to assess the quality of SRs have been developed [3−5]; the most recent and accepted of these instruments is the Assessment of Multiple Systematic Reviews (AMSTAR) tool, which incorporates an 11-item checklist [5]. A number of studies across a range of medical specialties have exposed shortcomings in the quality of SRs using this tool [6−9].

These limitations may be amplified in lower impact journals as many readers place greater credence and emphasis on articles published in journals with higher impact factor (IF) [10]. However, it is accepted that citation rates may be violated and inflated for a variety of reasons [11,12],

Conflict of interest: None.

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0895-4356/$ - see front matter
http://dx.doi.org/10.1016/j.jclinepi.2014.01.002

What is new?

Key findings

- Systematic reviews (SRs) published in higher impact Core Clinical Journals have higher methodological quality than those found in journals with lower impact factor (IF).
- Shortcomings in relation to the methodological quality of SRs remain with delineation of excluded studies and assessment of publication bias particularly lacking.

What this adds to what was known?

- Previous studies focusing on the reporting of clinical trials have revealed improved levels of reporting in higher impact clinical journals.
- This is the first article to investigate the relationship between IF and the methodological quality of interventional SRs.

What is the implication and what should change now?

- End users of SRs published in both high- and low-impact journals should be cognizant of limitations of reviews and consider these when using SRs to inform clinical practice or health-care policy.
- More active intervention by journal editors and reviewers to improve reporting quality of SRs should be considered.

with discrepancies also existing between databases. Although the relationship between the IF and the methodological characteristics of clinical trials has previously been considered [13], the association between the IF and the methodological quality of SRs has not been investigated; this relationship is important given the centrality of SRs to clinical practice and the preponderance of reviews in the biomedical literature. The objectives in our study were to relate the methodological quality of SRs adjudged using the AMSTAR tool to journal IF, hypothesizing that the methodological quality of SRs would be enhanced in higher impact journals.

2. Methods

2.1. Data sources and eligibility

We included interventional SRs published between July 1 and December 31, 2012, in the Core Clinical Journals [14] in MEDLINE via PubMed. The Abridged Index Medicus or Core Clinical Journals is an online journal index encompassing 118 journals involving all clinical medicine and public health specialties. The search was undertaken by one of the authors (P.S.F.) using the command "jsubsetaim[All Fields]" with search filters activated to identify meta-analyses and SRs. The IFs of journals surveyed were derived from a report by the Institute of Scientific Information's Journals Citation Report in 2012. An *a priori* sample size calculation was not performed.

2.2. Study selection and data extraction

Three researchers (P.S.F., D.K., and J.S.) were involved in screening the titles and abstracts of all retrieved references. Electronic copies of potentially eligible articles were retrieved and reviewed by the authors to assess eligibility. All SRs not dealing with comparison of interventions, for example; SRs of epidemiologic, diagnostic tests, or qualitative studies were omitted. Two reviewers extracted data independently from eligible reviews using standardized piloted forms with detailed written instructions. Initial calibration was performed on 10 articles, and interexaminer reliability was assessed on a subset of a further 20 SRs. Disagreements were settled by discussion or if necessary with the input of a third reviewer (N.P.).

We recorded data on region of publication, number of authors, involvement of a methodologist or statistician in the article, and whether meta-analysis was undertaken; methodologist involvement was based on reported affiliations or qualifications and information in the methodology of the review. We also assessed the inclusion of a PRISMA flow diagram, presentation of reasons for study exclusion, and reporting of recommendations for interventions [eg, Grading of Recommendations Assessment, Development and Evaluation (GRADE) or other]. We scored the compliance of each report with all 11 AMSTAR criteria including: provision of a priori design, duplicate study selection and data extraction, comprehensive literature search, publication status used as an inclusion criterion, listing of included and excluded studies, provision of characteristics of included studies, assessment and documentation of scientific quality of included studies, appropriate use of scientific quality of included studies to formulate conclusions, appropriate methods used to combine findings, assessment of publication bias, and stated conflict of interest. According to these criteria, a score of 0 or 1 was given for each criterion, with equal weighting given to each domain. A cumulative grade was given for the article overall after conversion to a percentage (%) scale based on fulfillment of these 11 criteria. The percentage score was implemented to account for the nonapplicable items, in which a meta-analysis was not undertaken as items relating to "appropriate methods used to combine findings" and "assessment of publication bias" were no longer relevant. For the SRs containing nonapplicable items, the denominators were reduced accordingly to calculate a score based on the