

LETTERS TO THE EDITOR

Should a systematic review be tested for reproducibility before its publication?



Currently, an important research topic is the lack of reproducibility of primary research studies [1,2]. The difficulty of reproducing results may jeopardize the trust of the readers of these studies. This lack of reproducibility also seems to affect secondary research in the form of systematic reviews [3]. I wondered whether systematic review authors could implement the reproducibility concept as another step in the methodology of systematic reviews to improve methodological robustness. In a systematic review with a focused research question, the following steps are usually considered [4]: research question, determining eligibility criteria, data search, data selection/collection, methodological assessment of primary studies, data assessment (statistics), and reporting of results and discussion. Another item, namely, a reproducibility test, could be added after the completion of the systematic review.

The reproducibility test could be implemented in two ways: first, reproducing the steps performed after the systematic review is finished by an author of the same research group who is not directly involved with the review. Hence, a reproducibility test would work as a quality control method of the conducted steps. In case there is a discrepancy in the results (before and after the reproducibility test), systematic review authors would be able to come back and further identify reasons for the discrepancies and address them. An alternative approach would be to have independent authors (or an independent research group) who are not directly involved with the systematic review. They would then test its reproducibility steps after the review was finalized. Then, all authors (or both research groups) could discuss the discrepancies and make the required corrections before submission. The level of discrepancy after reassessment could be tested and quantified for each step of the systematic review.

After the publication of the systematic review, its methodological robustness would be assessed by readers at two different levels: first, by checking the methodological quality/risk of bias of the systematic review with tools such as AMSTAR-2 [5] and ROBIS [6] and second, by evaluating the report of reproducibility results of the different steps, something that is unlikely to be captured by the evaluation with the methodological tools.

Therefore, this assessment could also be associated with a more transparent and complete way of reporting, where the whole process of reproducibility testing could be reported along with the article (eg, in an online supplementary file). Readers can then follow and verify the whole process and

conclude whether or not the systematic review is methodologically robust. A stricter systematic review methodology like that could also contribute to better filtering of the increasing number of low-quality systematic reviews being published [7]. After testing for reproducibility, authors of the systematic review can reflect whether their work is worth publishing. Hence, this measure could contribute to reduce the so-called waste of research [8,9] by avoiding the publication of studies with low or no reproducibility. Organizations involved with systematic review methodology [10,11] could develop specific guidance for reproducibility tests in systematic reviews.

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