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Reducing waste and increasing value through embedded replicability and reproducibility in systematic review process and automation



Clovis Mariano Faggion Jr. points out a serious problem starting a valuable discussion suggesting two approaches to facilitate the reproducibility of the systematic reviews [1]. Because performing systematic reviews are already time-consuming [2] and resource-rating [3], it is arguable how adding more steps such as reproducibility test that requires even more time and human resources could reduce waste and increase value compared to excluding some steps [4]. Here, I discuss how the replicability of methods and reproducibility of results (RMRR) have been embedded within the systematic reviewing and how “semi-automation” and “sharing” could solve RMRR issues [5].

The masterminds who developed the process of systematic reviewing considered involving at least between two or three people in screening and data extraction steps. Although the purpose of double-checking could be to reduce the errors [6,7], it also means the screening and data extraction are being repeated or replicated by at least one other member of the team to ensure the reproducibility of the same results in each step; when there are discrepancies, either these two members reconsider the decision for the third time or they ask the third member’s opinion. These two steps enjoy RMRR as embedded within the methodology. But how do we know if what has been said in the systematic review has actually been done? We usually trust the researchers but using the existing online semi-automated platforms that document the steps of the systematic reviews [8–12] could help the transparency if the team share the processes and methods openly, and share the results in findable, accessible, interoperable, and reusable format as advised by FAIR principles [13]. This is not the best practice right now [14] but we have what it takes to do the systematic reviews once without being worried about RMRR that is also a requirement in update step.

Following the protocol and sharing the data, [15,16] on the other hand, the meta-analysis step—based on established math embedded within software programs—can be repeated conveniently. It only leaves vulnerable search step behind. I intentionally kept the search, the first step, to discuss at last.

Like meta-analysis the search is rooted in computerized systems with certain differences:

- Unlike the computer programs for meta-analysis, the databases are not freely accessible to develop the search strategies or to repeat them;
- Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) mandates reporting of search strategy for at least one database [17], so RMRR is possible for only one database not all the databases;
- Last but not least, even if the authors decide to be generous in reporting the search strategies for all databases, they do not share the search results [14]. The main excuse for not sharing the search results is that the abstracts are copyrighted; however, it is and was always possible to share the search results excluding the copyrighted abstract after deduplication in RIS (RefMan/Reference Manager) format.

Apart from those review teams who have the privilege of using a study-based register to conduct a register-based study [4], the search step is the weakest point in terms of RMRR in evidence synthesis [18].

Although many follow PRISMA guideline in reporting the systematic reviews, it is not currently the primary purpose of PRISMA to ensure the RMRR in systematic reviews. My suggestion is for PRISMA 2019 to include items that enforces the scientific principles of RMRR through public data/methods sharing based on FAIR principles and using the online automated platforms where they support public accessibility to documented processes, methods, and data as recommended within seven available strategies for reproducibility of systematic reviews [18].

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