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Methodological letter

Tools and resources for conducting systematic reviews and meta-analyses

Herramientas y recursos para la realización de revisiones sistemáticas y meta-análisis

Roser Bono,[a,b,*] *María José Blanca*[c]

[a] *Department of Social Psychology and Quantitative Psychology, University of Barcelona, Spain*
[b] *Institute of Neurosciences, University of Barcelona, Spain*
[c] *Department of Psychobiology and Behavioral Sciences Methodology, University of Málaga, Spain*

In the field of surgery, evidence-based practice is essential to ensure the safety and effectiveness of surgical procedures. Systematic reviews and meta-analyses play an essential role in this process, as they allow for the available evidence to be critically evaluated and conclusions to be drawn from the synthesis of multiple studies. To carry out quality systematic reviews and meta-analyses in the field of surgery, it is crucial to have adequate tools and resources. Listed below are some of these essential tools and resources.

Databases and tools for reference management

Information on the studies that will be part of the systematic review can be downloaded from academic databases, such as Web of Science, Medline, PubMed or the Cochrane Database. In addition, the efficient management of bibliographic references is crucial in the study search and organization phase. Tools like EndNote, Zotero, and Mendeley make it easy to collect, organize and cite references, while synchronizing data online. These programs allow references to be imported directly from academic databases, saving time and ensuring that all studies are recorded correctly.

Tools for study selection

The study selection phase is critical for conducting systematic reviews. Rayyan and Covidence are fundamental tools in this process. Rayyan is a web and mobile application that streamlines the initial selection of titles and abstracts, optimizing collaboration between reviewers.[1] Its ability to transparently track progress and make joint decisions improves the coherence of study selection. Furthermore, Covidence is a primary screening and data extraction tool for Cochrane authors.

Statistical analysis software

Conducting a meta-analysis involves not only the selection of studies, but also an appropriate statistical analysis. MetaXL is a Microsoft Excel add-in for performing meta-analyses. Its functions make it easy to combine data from multiple studies and generate effect size estimates.[2] Comprehensive Meta-Analysis is software that allows the researcher to enter data and perform a simple analysis in a matter of minutes, although it also has advanced functions.[3] Other software, such as Stata and R, have incorporated commands and

* *Corresponding author at: Departamento de Psicología Social y Psicología Cuantitativa, Facultad de Psicología, Passeig de la Vall d'Hebron, 171, 08035 Barcelona, Spain.*
E-mail address: rbono@ub.edu (R. Bono).
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packages that provide versatility when performing specific statistical analyses of a meta-analysis.[4,5] More recently, IBM-SPSS has included meta-analysis procedures. We also cannot overlook the significant contribution of RevMan, a tool developed by the Cochrane Collaboration that provides standardized templates and formats for the preparation of systematic reviews and meta-analyses. It is designed to meet the Cochrane Collaboration's rigorous quality standards at all stages of the review process.

It is important to keep in mind that, due to the complexity of the meta-analysis and the need to carry out appropriate statistical analyses, it is advisable to use specialized software and follow best practices in conducting meta-analyses. These software packages provide for the visualization of results using well-known forest plots and funnel plots; fixed, random or mixed-effects analysis; meta-anovas, meta-regressions, subgroup analysis, publication bias analysis, etc. The ability of software to explore heterogeneity between studies and perform subgroup analyses increases the possibility of obtaining clinically relevant conclusions.

Guidelines and protocols

The PRISMA[6] guideline is the most popular for conducting systematic reviews and meta-analyses on the effectiveness of interventions in the healthcare field. It was designed with the objective of being able to transparently document the reason for the review, what the authors did, and what they found.[7] This guideline consists of several items on reporting in each of the sections of a systematic review or meta-analysis in order to guarantee its replicability. In 2020, there was an update due to advances in methodology and terminology of the reviews.[7] Another instrument developed in the health field is the AMSTAR[8] tool, which consists of items concerning the quality of the methodology, rather than the quality of the report. Finally, the Cochrane protocols describe in detail the process of preparing systematic reviews on the effects of healthcare interventions.

Conclusions

The combination of the resources and tools presented herein enables us to conduct efficient and quality systematic reviews and meta-analyses in the field of surgery. From reference management to statistical analysis, each tool contributes to improving efficiency and transparency when synthesizing evidence. By adopting these tools, the scientific community can move towards a more robust and reliable evidence-based surgical practice, which provides a good basis for decision-making in the clinical setting.

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