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Editorial

Systematic reviews and meta-analyses: Valuable pieces of the clinical decision-making puzzle



The first special issue of the *Journal of Hand Therapy* that was comprised of systematic reviews was published in 2004 and guest edited by our current editor in chief, Dr Joy MacDermid. She hoped that the special issue would raise interest and awareness in evidence-based practice and that clinical practice guidelines would be developed in the future.¹ Fifteen years later, evidence-based practice is taught in entry-level occupational and physical therapy programs along with critical appraisal skills for the purpose of improving clinical decision-making. Occupational and physical therapists can now access nearly 300 clinical practice guidelines on the websites of the American Occupational Therapy Association (<https://www.aota.org/Practice/Researchers/practice-guidelines.aspx>) and American Physical Therapy Association (<https://www.ptno.org/clinical-practice-guidelines>). We are honored to bring the readership of this journal an updated collection of high-quality systematic reviews and meta-analyses that provide a snapshot of the current state of evidence for several important clinical issues. For this issue, we have aimed to provide a resource for both clinicians and researchers for a broad range of important topics, including occupation-based interventions, flexor tendon rehabilitation, joint protection techniques, conservative management for hand arthritis, improving adherence, and more.

We are indebted to the authors who contributed to this issue by conducting these systematic reviews. Saleh et al² reported that the mean time for completing a comprehensive systematic review database search is 24 hours. Borah et al³ analyzed the time needed to conduct systematic reviews of interventions and found the mean estimated time to complete and publish a systematic review to be 67.3 weeks. With an understanding of the amount of time needed to complete a high-quality review, we started inviting authors more than two years ago. Thankfully, the majority of the authors of the systematic reviews in this special issue are familiar with the process, and several of the articles published in this issue have been available online for a period of time.

The systematic review process is now facilitated by the development of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.⁴ These guidelines were not available when the first special issue was published, and they help ensure a quality-reporting process. Following these guidelines when authoring a systematic review helps to ensure a standardized process is followed. Just like any clinical trial, a systematic review should provide enough information to be repeated. The PRISMA guidelines include a flow diagram for study selection and a checklist to ensure standardized content of the

review. The guidelines are an excellent tool for both authors and for reviewers.

As consumers of research, therapists should have an understanding of the systematic review process and the components of a high-quality review. Just like any individual study, a systematic review should demonstrate internal validity. This means including specific, appropriate eligibility criteria for inclusion, demonstrating an unbiased study-selection process, and a reproducible assessment of the quality of the studies within. If possible, the studies included within the review should be of high methodological quality to have confidence in the overall results and recommendations. The strength of the recommendations that the authors of the systematic review make should be in accordance with the precision of the results and how similar the results of the included studies are to each other.

When several studies address the same research question and have similar parameters, authors of meta-analyses can pool these results together and provide an indication of the overall effectiveness of interventions by calculating effect sizes. In some of the reviews in this issue, pooling of the data was not possible because the individual studies were too dissimilar to combine. Other studies included in this issue did include a meta-analysis of the results and displayed these results using forest plots when the evidence was homogenous. These graphical displays of results from a number of scientific studies addressing the same question visually demonstrate the differences between studies and can provide an estimate of the effectiveness of an intervention.

The final step in synthesizing a systematic review is determining how the results can be applied to clinical decision-making and to client care. Decisions regarding treatment interventions must be made through the diligent, unambiguous, and thoughtful use of current best evidence.⁵ Therapists often search the literature to help answer a clinical question, and systematic reviews are a good place to start. Understanding how applicable the results of any specific review are to a particular clinical question is very important. Similar to clinical trials, results of a systematic review may have limited applicability to a specific clinical question depending on the population studied, the interventions used, and the outcomes measured. The relationship between how well research results fit a specific clinical question is also termed external validity. This concept of external validity or applicability to other contexts is not covered specifically within the PRISMA guidelines. The guidelines do recommend inclusion of information surrounding study parameters such as population studied, interventions, and

outcomes, but do not provide direction on how to apply these results to clinical situations. Reporting guidelines should be developed in the future to create a standardized process for determining the generalizability of systematic reviews.⁶ These guidelines would help clinicians determine whether the literature fits their specific clinical questions.

Clinicians should also understand publication bias when reading systematic reviews. All systematic reviews are inherently based on the literature that is available related to the subject or research question. It would be optimal if all research that has been performed related to a subject would be published and easy to access. This is highly unlikely. There is always some amount of bias in a systematic review based on what articles are published. Research studies that show positive results or significant treatment effect of an intervention are more likely to be published⁷ and cited⁸ than those with little or no treatment effect. When this occurs, even a perfectly conducted review will overestimate the effect of a given treatment because studies with little or no effect are less likely to be published.

One solution to reduce publication bias is prospective registration of all clinical trials and systematic reviews. Registration improves transparency surrounding all the research available on a subject and is not dependent on final publication of the research projects. Many journals now require prospective clinical trial registration as a requirement of publication in their journals. Clinicaltrials.gov is a large online trial registry in the United States that was created to improve information sharing in this regard and includes over 230,000 clinical trials, but is still not a complete representation of all research. Unpublished studies within the registry may not have gone through the rigors of a peer review, and specific details surrounding the methods and results of these studies are often not available. Clinical trials taking place outside the United States and those targeted for journals that do not require registration are more likely to be missing from the registry. More work is needed to improve the prospective trial registration process and information available within the registry to help reduce publication bias.

With the multitude of research that is published on a daily basis, busy clinicians may have difficulty reviewing multiple studies related to a particular clinical decision. Systematic reviews can serve as a practical tool for therapists who need to make therapeutic decisions because the authors of the systematic reviews have methodologically searched and summarized results for all the

available evidence regarding a therapeutic question. It is important to remember that finding evidence in the literature to support a clinical decision is only part of the process. Clinicians should also take into account whether all relevant outcomes have been considered, the risks and benefits of any treatment choice, and incorporate client values and preferences into any clinical decision. We are hopeful that the systematic reviews and meta-analyses in this issue help identify gaps in research to generate future studies, answer some current and future clinical questions, and potentially form the basis for future clinical practice guidelines.

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References

1. MacDermid JC. Evidence based practice. *J Hand Ther.* 2004;16:103–104.
2. Saleh AA, Ratajeski MA, Bertolet M. Grey literature searching for health sciences systematic reviews: a prospective study of time spent and resources utilized. *Evid Based Libr Inf Pract.* 2014;9:28–50.
3. Borah R, Brown AW, Capers PL, Kaiser KA. Analysis of the time and workers needed to conduct systematic reviews of medical interventions using data from the PROSPERO registry. *BMJ Open.* 2017;7:e012545.
4. Moher D, Liberati A, Tetzlaff J, Altman DG, Group P. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *J Clin Epidemiol.* 2009;62:1006–1012.
5. Lalken A, McCluskey A. Statistics V: introduction to clinical trials and systematic reviews. *Anaesth Crit Care Pain Med.* 2008;8:143–146.
6. Aveller SA, Thomas J, Kleinman R, et al. External validity: the next step for systematic reviews? *Eval Rev.* 2017;41:283–325.
7. Song F, Parekh S, Hooper L, et al. Dissemination and publication of research findings: an updated review of related biases. *Health Technol Assess.* 2010;14:iii. ix–xi, 1–193.
8. Duyx B, Urlings MJE, Swaen GMH, Bouter LM, Zeegers MP. Scientific citations favor positive results: a systematic review and meta-analysis. *J Clin Epidemiol.* 2017;88:92–101.