

An Overview of Systematic Review

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Systematic review is an invaluable tool for the practicing clinician. A well-designed systematic review represents the latest and most complete information available on a particular topic or intervention. This article highlights the key elements of systematic review, what it is and is not, and provides an overview of several reputable organizations supporting the methodological development and conduct of systematic review. Important aspects for evaluating the quality of a systematic review are also included.

Keyword: systematic review.

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IN THE RAPIDLY CHANGING CONTEXT of health care delivery, busy clinicians are dependent on easy access to the best available evidence. As knowledge has been established through focused research efforts, the need to synthesize this growing body of knowledge has resulted in a methodology known as systematic review. A systematic review is the basis for evidence-based practice.¹

Systematic review involves analysis of the published evidence identified from an exhaustive review around a focused question. The goal of a systematic review is to synthesize the latest research findings into a single document that represents the most up-to-date and complete representation of the body of knowledge on a particular topic. Systematic reviews help clinicians

identify what is known and not known on a topic, particularly an intervention; identify and understand inconsistencies among research findings; and help delineate whether findings can be applied to specific subgroups of patients.² The clinician can be confident that the systematic review, if published using the systematic review protocol guidelines from a reputable organization, represents the latest and most complete information available on the particular topic of interest.

What Is Systematic Review

A systematic review is a scientific inquiry that relies on a focused question and predetermined protocol to identify, critique, and ultimately summarize different primary research studies. As opposed to relying on the results of a single research study, a systematic review provides an analysis of the results of multiple research studies to formulate the current state of knowledge regarding the focus of study. The results can vary from authoritative statements of practice advisories to recommendations for further research.

The process of a systematic review is just as it sounds: systematic. Readers of systematic reviews benefit from an understanding of the elements of a high-quality systematic review. This knowledge allows the reader to make an independent judgment of the potential value, validity, and reliability of each systematic review. The “systematic” component of a systematic review is the defining feature of the review itself and results in the systematic

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Conflict of interest: None to report.

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1089-9472/\$36.00

<http://dx.doi.org/10.1016/j.jopan.2014.07.002>

review being considered the highest level of evidence available to guide and inform practice.

As a scientific overview of primary research on a particular research question, a systematic review tries to identify, select, synthesize, and appraise all high-quality research evidence relevant to a well-honed question. Systematic reviews seek to collate all evidence that fits prespecified eligibility criteria to address a specific research question. The eligibility criteria is composed of both inclusion and exclusion criteria that delineate what types of studies will and will not be included in the systematic review. “Systematic reviews aim to minimize bias by using explicit, transparent, and systematic methods” (<http://www.cochrane.org/about-us/evidence-based-health-care/>).

It is important to point out that historically, systematic reviews have been focused solely on randomized controlled trials (trials of cause and effect). This has changed, however, in recent years to include systematic reviews of other quantitative designs, as well as qualitative and economic study designs. As is well known in the discipline of nursing, many questions of great importance cannot be answered through randomized controlled trials (examples include quality of life studies, death and end-of life decisions, and experiential studies). Through innovative and novel research design methods, credible organizations have developed ways to synthesize qualitative studies that have similar methodological qualities into concise themes. These consolidated themes, in turn, guide practice and future research.

What Is Not Systematic Review

Even in highly regarded peer-reviewed journals, authors will title their work a systematic review when it is actually another type of review (ie, critical, integrated, or literature). A systematic review should report explicit, rigorous, and reproducible methods to minimize bias. These methods include a well-defined research statement/question; specific inclusion and exclusion criteria for studies to be included in the analysis; and exhaustive comprehensive searching using three steps: (1) predefined databases are searched using specified terms in the keywords, title, and abstract fields, (2) keywords and index terms from the literature obtained in the first step are searched across all appropriate databases, (3) reference lists from

the studies identified in the first two studies are then searched. The list of databases to be searched should allow access to both published peer-reviewed literature and unpublished literature that is sometimes referred to as “grey literature.”

For data extraction and analysis, a systematic critical appraisal process unique to each type of study design is conducted by two appraisers working independently. Finally, the validation of study selection for analysis should occur by at least two independent reviewers. Throughout the process, two appraisers work independently through each step and then engaging in dialogue until they come to agreement.³ Documentation of the entire process should be maintained.

Systematic Review Organizations

There are several international organizations that devote their expertise to developing the methodologies behind systematic review so that the synthesis of the best evidence is valid and reliable. These include the Campbell Collaboration, Centre for Reviews and Dissemination, Cochrane Collaboration, Institute of Medicine, and Joanna Briggs Institute. These organizations provide guidance, training, and software to support the synthesis of varied types of evidence including quantitative, qualitative, and economic evidences.

Although independent and distinct, the organizations work collaboratively to promote synthesis methodology and the importance of evidence synthesized in the form of a systematic review. Each of these specialized organizations have devoted enormous resources and expertise to furthering the rigor and effectiveness of systematic review for changing health care and social practices based on best evidence.

Campbell Collaboration

The Campbell Collaboration (C2) (http://www.campbellcollaboration.org/artman2/uploads/1/Campbell_mal_Campbell_Collaboration_Improving_the_evidence_base_for_social_policy_and_practice.pdf) based in Oslo, Norway, focuses on systematic reviews in education, criminal justice, social policy, and programs synthesizing the effect of social intervention. Their goal is to help people make well-informed decisions by preparing, maintaining, and disseminating systematic reviews.

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