

Chiropractic Philosophy & Clinical Technique

Understanding Literature Review Designs

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A literature review provides a synopsis of existing research on a given topic. Reviews can target research findings that deal with a particular condition, a type of treatment, a diagnostic method, or other technology. There are 3 basic types of literature reviews: narrative reviews, systematic reviews, and meta-analyses. The types present the collective findings of research on a topic, but differ in their methodologies.

Systematic reviews (a.k.a. qualitative systematic reviews) employ very strict, well-defined methods of locating, appraising, and synthesizing all research available on a topic. As a result, a systematic review is considered an efficient scientific technique.¹ A systematic review is defined as “the application of scientific strategies that limit bias to the systematic assembly, critical appraisal, and synthesis of all relevant studies on a specific topic.”² Articles included in a systematic review are evaluated by 2 or more reviewers using appraisal instruments to ensure impartiality.

A **meta-analysis** (a.k.a. quantitative systematic review) is essentially a system-

atic review that combines the quantitative data from the included studies using specific methodological and statistical procedures. A definition of a meta-analysis is: “A systematic review that employs statistical methods to combine and summarize the results of several studies.”² Because of the rigorous methods, readers of systematic reviews and meta-analyses should be able to reproduce the study’s quantitative section and come up with similar results.³

Narrative reviews typically cover a topic broadly, whereas systematic reviews are more focused.⁴ A systematic review can synthesize the findings of its included studies, representing the middle ground of their collective results. Moreover, new hypotheses that were not presented in the individual studies can be tested in meta-analyses.³ (See Table 1.)

Table 1. **Types of literature review designs**

<i>Narrative review</i>	<ul style="list-style-type: none">• Selective review of the literature• Covers a topic broadly• Does not follow strict systematic methods to locate and synthesize articles
<i>Systematic review</i>	<ul style="list-style-type: none">• Thorough and clear-cut search strategies utilized• Focused topic• Articles methodically appraised and synthesized
<i>Meta-analysis</i>	<ul style="list-style-type: none">• Results of studies quantitatively combined• Pooled results of relevant studies statistically analyzed

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Narrative and Systematic Reviews

Sometimes it is difficult to decide whether a given review is systematic or narrative because there are no strict rules that can be applied to the construction of either type. Moreover, some narrative reviews are carried out in a strict manner, looking much like systematic reviews. Other systematic reviews are carried out carelessly and look like the narrative variety. McAlister et al.⁵ examined the quality of review articles that were published in 6 popular general medical journals and found that only a minority of them indicated that they had employed rigorous methods to identify, evaluate, and synthesize articles. They thought these deficiencies probably weakened the validity of the conclusions presented in the reviews.

Narrative reviews have several drawbacks: 1) they are naturally prone to bias because they are largely subjective in relation to their unmethodical approach. Without the use of systematic methods, authors of reviews are often in conflict on basic issues, such as what to do with quantitative evidence that is discovered or which types of studies to include; 2) narrative reviews tend to provide a general viewpoint on a topic that is more likely to be derived from a biased review of the evidence; 3) the process of deciding which studies to include in a narrative review may be discriminatory and inclined to support the beliefs of the authors. Studies that are in agreement with the authors' beliefs may be more likely to be cited, while conflicting studies are ignored; 4) the approach used to draw conclusions based on narrative reviews from the integrated studies may be problematic.⁶ It is usually unclear how the conclusions follow from the articles that were examined. It's common practice to count the number of studies that support one side of a topic and then

make a comparison with the number in support of the opposite side. The opinion with the highest number of supporting articles wins, which is reflected in the reviews conclusion. This practice does not take into consideration differences among the studies concerning the magnitude of the treatment effect, the sample size, and the research design utilized. These variables are taken into consideration in systematic reviews and meta-analyses. Because of these limitations, it is not uncommon for multiple narrative reviews on a given topic to draw conflicting conclusions.

In spite of the limitations of narrative reviews, they can be quite valuable to practitioners because they summarize in general what is contained in the literature and provide a viable source for relevant background information. They are often written by authors who are considered to be experts in a given field, who are inclined to write them because they are comparatively easy to carry out and compose. Practitioners may prefer reading them over more complex designs, because they present the views of an expert on a given topic concisely and in a manner that can be read and comprehended quickly without having a lot of background knowledge.

Systematic reviews and meta-analyses are much more objective than narrative reviews and can help resolve conflict when other sources of evidence are in disagreement. Nevertheless, the findings of any type of literature review can be contradictory as a result of divergent interpretations and inferences made by the authors.⁷ One review may conclude that a particular intervention is beneficial, while another suggests that there is no benefit or that it is possibly even harmful. These differences become especially important when used to

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make health care decisions. When disparity exists among reviews, it may be explained by examining the search criteria and methods that were utilized in the studies to see if they were carried out differently. At any rate, when several systematic reviews are done on the same topic, they sometimes arrive at inconsistent conclusions.³

Treatment recommendations are frequently offered in the discussion sections of review articles, as well as in original articles and practice guidelines. The validity of these recommendations is variable and depends to a large extent on the rigor of the studies from which they were derived.⁸ As might be expected, comprehensive systematic reviews involve the highest rigor, making them the most valid and hierarchically higher than the other sources of treatment recommendations. The next step down in this hierarchy is high-quality, evidence-based practice guidelines, followed by less rigorous systematic reviews. The lowest level of rigor and the weakest validity for treatment recommendations based on reviews occur when the evidence is derived from narrative reviews.

Qualities of a Good Review

The purpose of the review should be clearly stated in the introduction, which lets the reader know that it was well planned. This is particularly important for systematic reviews, but it also applies to narrative reviews. Without a clear statement of purpose or study question, a review will probably lack direction and produce lackluster conclusions.

Literature reviews should incorporate a comprehensive search for relevant studies that examines more than just MEDLINE; especially when exploring chiropractic-

related topics.⁹ On the other hand, a search of only chiropractic- or manipulation-related databases that excludes MEDLINE is likely to miss important references.¹⁰ Therefore, reviews that search multiple databases are preferred, and single-database searches would be considered flawed. The search strategy should be clearly described and the criteria used for study inclusion delineated. In fact, if the reasons for selecting and including studies in the review are missing or incomplete, the review may not be valid.

In addition to electronic database searches, hand-searching of individual journals and the reference sections of the included articles is carried out in better-quality reviews.¹¹ This is because databases do not include all studies. For instance, items such as conference abstracts and articles published in journal supplements are not typically included in databases, yet they may contain information pertinent to the review. Also, it may be difficult to locate studies because of vague or misleading search terms that were used to index articles included in the database. Randomized controlled trials (RCTs) are sometimes missed during an electronic search even though a MEDLINE record actually exists because the publication type terms “randomized controlled trial” or “controlled clinical trial” are missing.¹¹

An adequate literature search should be carried out in the review. Selected search terms should locate the full extent of available research relating to the study question. Selected databases should be likely to cover the review topic effectively. The time period that the search encompassed should also be provided. The methods of the literature search should be described in enough detail so that another person could duplicate the results. After evaluating the

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search methods, one should consider what the likelihood is that relevant studies were missed during the search.

The inclusion and exclusion criteria used to select articles for the review should be provided. If these criteria are listed, readers can be more confident that the authors did not unfairly cite studies that support their own position and exclude those that were in opposition. Selection criteria may address the type of study, the methods employed, the population studied, the intervention used, or the outcomes. The more explicit the selection criteria are, the more focused the review will be.

The methodology of articles included in a high-quality review must be systematically assessed, and the authors should clearly describe the appraisal criteria used. Studies should be appraised in a dependable manner, preferably by more than 1 reviewer using a reliable appraisal instrument. The likelihood that the assessment process is correct is strengthened when several reviewers agree about a study's validity. Sometimes, the actual appraisal instrument used by the reviewers is included in an appendix, which allows readers to evaluate the study's methodology more closely. Narrative reviews do not typically utilize strict appraisal methods, which weakens their validity and usefulness in solving clinical problems.

The synthesis and resulting conclusions in a review should accurately represent the information contained in the articles obtained in the literature search. The potential for bias in this part is noteworthy since authors have a certain amount of latitude in the way they interpret and judge articles. If a review's conclusions are not supported by the literature reviewed, the validity of the entire article is in doubt.

Some reviews merely summarize results of incorporated studies by comparing the number with "positive" findings and the number with "negative" findings. The main problem with this method is that large studies are weighted equally with small studies, even though the larger studies should have proportionally more influence on the review's overall results. Also, when the total numbers of positive and negative studies are simply added and compared, the relative validity of the studies may not be taken into consideration.

The references section should be comprehensive with all of the articles that were included in the review appropriately referenced. References should be derived almost entirely from peer-reviewed journals, although conference proceedings, textbooks, and government documents are sometimes included. Articles from evidence sources that are not peer-reviewed are generally not trustworthy and should rarely be referenced in a good review article.

Review Articles of Great Value to Practitioners

The Agency for Health Care Policy and Research placed systematic reviews and meta-analyses at the highest position in the hierarchy of evidence—even above RCTs. Indeed, evidence-based practitioners are advised to seek out systematic reviews to facilitate clinical decision-making ahead of the other types of articles.¹² This is because systematic reviews take into account all of the RCTs available on a specified topic and then draw a conclusion based on the collective information derived from all of these studies. Since it is rare for all studies to totally agree on an issue, an article that can effectively present their overall results is of great value.

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Even though reviews are meticulously prepared using explicit criteria, they still require critical appraisal to verify their validity. A number of checklists are available to assist with the appraisal of review articles, and their use is highly recommended.¹³⁻¹⁶ Furthermore, after establishing their soundness, one still needs to determine if the information is applicable to the given clinical circumstances.¹⁷ To make this determination, look to see whether the intervention, patient popula-

tion, and setting dealt with in the review apply to the care of your patients. ■

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