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Invited Editorial

Decoding the synthesis of evidence: concepts

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ABSTRACT

A stage considered essential to the implementation of the practice informed by evidence is called the *synthesis of evidence*. However, its design and implementation is still far from researchers, educational institutions and research professionals, etc. In order to facilitate the understanding of readers on the subject, concatenating concepts and practice, are detailed below as the spring and summer OBJN editorials. One of the most accepted ways to develop the synthesis of science is the systematic review of the literature (SLR). The explicit, systematic and reproducible methods used in the SLR aim to minimize different types of bias, including critical evaluation of the quality of the studies that meet the inclusion criteria of the review in question. When the evidence produced generates recommendations for practice and policy, the inclusion of low-quality evidence at high risk of bias is problematic.

Descriptors: Publication Formats; Access to Information; Evidence-Based Nursing.

The practice informed by evidence (PIE) does not dispense three elements to its actual implementation over the world, namely: personal characteristics, leadership and organizational climate[1].The essential stage for implementing the aforesaid PIE is called the *synthesis of evidence*. However, its design and implementation is still far from researchers, educational and research institutions, professionals and others. Thus, in order to facilitate the understanding of its readers on the subject, concatenating concepts and practice, the spring and summer OBJN editorials follow, respectively.

Given the explosion of knowledge, including approximately two million new entries in scientific publications in the literature basis every year, it is difficult for clinicians to develop synthesis processes of science, due to the expertise and resources that such a process requires. For this reason, there must be specialized teams, trained to use rigorous methods in order to gather and evaluate all the available evidence on particular topics of interest, thus relieving clinicians of such burdens[1].

There are several factors that can motivate authors to make the synthesis of evidence: the clarification of conflicting evidence, an approach to issues whose clinical practice is uncertain, the exploration of variations in practice, confirmation of the adequacy of current practices, or the prominent need for future research[1].

One of the most accepted ways to develop synthesis of science is the systematic literature review (SLR). Thus, there is a growing number of specialist collaboration institutes and centers, which have qualified personnel to train reviewers, perform systematic reviews and facilitate cooperation among employees[2].

The SLR is a complex secondary study, which is detailed and reproducible, that involves a significant commitment of time and other resources. This methodology is a process used to locate, summarize and aggregate from the primary literature, all the existing evidence on a particular topic and, for this, the reviewer uses a secondary data source. The SLR is an attempt to integrate empirical data from the primary studies, in order to discover the international evidence and produce statements that should guide clinical decision-making. Therefore it requires an explicit and comprehensive communication of the methods used[2,3].

Even when the evidence is limited or nonexistent, the SLRs summarize the best available evidence on a specific topic, providing the best of them to support decision-making and to be useful for future clinical research needs[1]. In the event of no primary information on a particular topic, expert opinion may be the best evidence available[2].

The explicit, systematic and reproducible methods used in the SLRs are aimed at minimizing different types of bias, thus providing more reliable results to support the conclusions and decisions. The SLR can, therefore, be defined as: a reproducible and explicit methodology; a systematic search that attempts to identify all studies that meet the eligibility criteria; an assessment of the validity of the conclusions of the studies included, for example, by assessing the risk of bias; a systematic and summarized presentation of the characteristics and results of the included studies[2,4].

Therefore, for any SLR, the following steps should be developed: formulating a review question; setting of inclusion and exclusion criteria; locating the studies; selecting the studies; assessing the methodological quality of studies; extracting data; analyzing, summarizing and synthesizing the relevant studies; presenting the results; interpreting the results and determining the applicability of the results[4].

To guide a review, a guiding protocol adjusted to the revision typology should first be

developed. An SLR protocol must be composed of different sections, such as the title, information on the authorship, background, inclusion and exclusion criteria for selecting studies, and research methods for identification of studies, a critical evaluation of its quality, as well as the extraction and synthesis of the data. In the background, the arguments supporting the need to develop the review should be presented and the concepts in question should be defined. The various elements of the PICO strategy, or the respective specific adaptation for each revision, should also be placed in context. The methods section that specifies the inclusion and exclusion criteria for selecting studies includes the type of study, participants, intervention, and outcome measures; the criteria to be specified may vary depending on the type of SLR that is planned[4].

After performing the SLR, the reviewers should present a report and the structure must be inherent to the development of sections of the protocol. Generally, it should contain: (i) data on the risk of bias of the included studies and from the process of analysis of the methodological quality; (ii) a description of the studies included in the review; (iii) results that address the issue of revision; (iv) a discussion of the results, indicating the weaknesses of the review and the included studies, and the implications for practice and research; and finally (v) a conclusion on the matter of review[4].

A critical step in any SLR is the critical evaluation of the quality of the studies that meet the inclusion criteria of the revision in question. The notion of methods to minimize bias and establish credibility in systematic reviews has been widely developed and discussed in terms of quantitative and qualitative evidence.

The goal of critical evaluation is to estimate the extent to which the potential risks of bias and quality consistency were minimized during the conceptualization and realization of individual primary studies and whether there was adequate use of the method and methodology. Each eligible study should be evaluated based on a set of criteria to establish the validity and reliability of the process and results. This critical evaluation should be presented in the report, in the review of the results section, and it should be followed by a discussion on the methodological quality and the potential risk of bias in all studies, which were included and excluded based on this critical judgment.

When the evidence produced generates recommendations for practice or policy, the inclusion of low-quality evidence with a high risk of bias is problematic. In the revisions recommended by the Joanna Briggs Institute (JBI), the moderators can set a cut off point to guide the decision to exclude studies considered to be of low quality or at high risk of bias. However, it is possible to consider alternative approaches, such as meta-regression or sensitivity analysis, in case there is room for meta-analysis[4].

The evidence on the effects of interventions can be made from studies with diversified risk of bias. There are two approaches that are equally reasonable in conducting a systematic review of effectiveness. The first approach is aimed at only including studies with a low or moderate risk of bias, justifying how this risk is determined and what is considered as the degree of bias risk and excluding all studies considered to be at high risk; and secondly, to include all studies, regardless of their risk of bias, and explicitly consider the risk of the different studies during data synthesis[1].

The evaluation of the quality of quantitative efficacy studies included in a review should emphasize the risk of bias of the results, that is, the risk of overestimating or underestimating the effect of the intervention[3]. Bias should not be confused with inaccuracy. The first refers to the systematic error, while precision is the random

error and is reflected in the confidence interval around the intervention effect estimate of each study and the weight given to the results of each study in a meta-analysis. The most accurate results have more weight in the meta-analysis[3.4].

The Cochrane Collaboration established the difference between risk of bias and methodological quality. The term assessment of the methodological quality has been used to refer to the critical evaluation of the included studies and it suggests that the study was developed under the highest methodological standards[3].

A study can be performed with the highest possible quality standards; however, it can have a high risk of bias, such as, for example, the impracticality of concealing the intervention to participants to which they are to be subjected. In fact, this is a condition of non-pharmacological interventions compared to the usual care (e.g., cognitive stimulation), which is contrary to pharmacological interventions, on which it is possible to make blind studies with a drug and a placebo. Another example is an operation in which it is impossible to hide such intervention. Thus, it is inappropriate to judge these studies as having poor quality, but this does not mean, however, that they are free from bias resulting from knowledge by intervention that the participants are subject to[3].

The risk of bias in the results of each study, which contributes to an estimate of the effect, is one of several factors that should be considered when evaluating the quality of a body of evidence. In efficacy studies, the control of the risk of bias is oriented to the characteristics of the studies, regarding selection, intervention, detection, friction, and publishing, amongst others.

In the SLR of qualitative studies, the synthesis of evidence is also justified because the results should not be considered to make recommendations regarding practice from a single qualitative study[4]. As in quantitative research, the critical evaluation of qualitative primary studies is also essential to establish their quality[4.1].

Traditionally, the terms used to critically assess the accuracy of the research are the reliability and validity. Typically, reliability is the extent to which the results of a study relating to a measurement are reproducible in different circumstances. Validity, in turn, refers to the degree to which a study reflects or evaluates the specific concept that the researcher is attempting to measure accurately. However, the critical assessment of qualitative studies has different contours. Issues, such as those considered to be ontological, epistemological, methodological, and ethical of the affiliation, background and the experience and context of the investigator, are fundamental to assess the value of the primary qualitative research and can make the synthesis of qualitative results a complex and daunting task[4,6].

The reliability and reproducibility of the measurements, the internal and external validity and the objectivity are considered to be criteria, which are essential for the quality of quantitative studies. In qualitative studies, we should consider the relevant criteria. In this sense, the concepts of dependability, credibility, transferability and confirm ability, suggested by Lincoln and Guba[1], should be considered to establish the value of a qualitative study.

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