

# Contributions of Systematic Reviews and Meta-analyses to Nursing Education, Research, and Practice

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**Theme:** Evidence-based practice.

**Contribution to the discipline:** Systematic reviews and meta-analyses have contributed significantly to nursing education, research, and practice. Synthesizing evidence through quality systematic reviews and meta-analyses adds to the disciplinary development of nursing and helps in decision-making regarding the care needs of patients.

## Abstract

Systematic reviews and meta-analyses are helpful methodological alternatives that combine, discuss, and assess the quality of the best available evidence through adequate and exhaustive searches of the literature. In the last decade, there has been an increase in systematic reviews and meta-analyses in nursing research. This article intends to reflect on the contributions of systematic reviews and meta-analyses to nursing education, research, and practice. Synthesizing the evidence through high-quality systematic reviews and meta-analyses adds to the disciplinary development of nursing; therefore, students and professionals in the field should be encouraged to employ these methodological tools in education and research and implement the results of these methods in clinical practice for making better decisions regarding the individual needs of patients.

### **Keywords (Source: DeCS)**

Systematic review; meta-analysis; Nursing education; evidence-based practice; Nursing research.

## 4 Contribuciones de las revisiones sistemáticas y los metaanálisis en la educación, la investigación y la práctica de la Enfermería

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### Resumen

Las revisiones sistemáticas y los metaanálisis son alternativas metodológicas útiles que, mediante búsquedas adecuadas y exhaustivas de la literatura, consiguen combinar, analizar y evaluar la calidad de la mejor evidencia disponible. En la última década ha habido un aumento en la publicación de revisiones sistemáticas y metaanálisis en la investigación en Enfermería. Este artículo tiene como propósito realizar una reflexión sobre las contribuciones de las revisiones sistemáticas y los metaanálisis en la educación, la investigación y la práctica de la Enfermería. Sintetizar la evidencia a través de revisiones sistemáticas y metaanálisis de buena calidad aporta al desarrollo disciplinar de la Enfermería, razón por la cual se debe estimular a estudiantes y profesionales de la disciplina a hacer uso de estas herramientas metodológicas en la educación y la investigación, así como la implementación de los resultados de estas metodologías en la práctica clínica, para la toma de mejores decisiones frente a las necesidades individuales de los pacientes.

### Palabras clave (Fuente: DeCS)

Revisión sistemática; metaanálisis; educación en enfermería; práctica clínica basada en la evidencia; investigación en Enfermería.

# Contribuições das revisões sistemáticas e das metanálises na educação, na pesquisa e na prática da Enfermagem

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## Resumo

As revisões sistemáticas e as metanálises são alternativas metodológicas úteis que, por meio de buscas adequadas e exaustivas da literatura, conseguem combinar, analisar e avaliar a qualidade da melhor evidência disponível. Na última década, houve um aumento na publicação de revisões sistemáticas e metanálises na pesquisa em Enfermagem. Nesse sentido, o objetivo deste artigo é realizar uma reflexão sobre as contribuições das revisões sistemáticas e das metanálises na educação, na pesquisa e na prática da Enfermagem. Sintetizar a evidência a partir de revisões sistemáticas e metanálise de boa qualidade contribui para o desenvolvimento da disciplina de Enfermagem, razão pela qual estudantes e profissionais da área devem ser estimulados a fazer uso dessas ferramentas metodológicas na educação e na pesquisa, bem como a implementar os resultados dessas metodologias na prática clínica, para a tomada de melhores decisões diante das necessidades individuais dos pacientes.

### Palavras-Chave (Fonte: DeCS)

Revisão sistemática; metanálise; educação em Enfermagem; prática clínica baseada em evidências; pesquisa em Enfermagem.

## Introduction

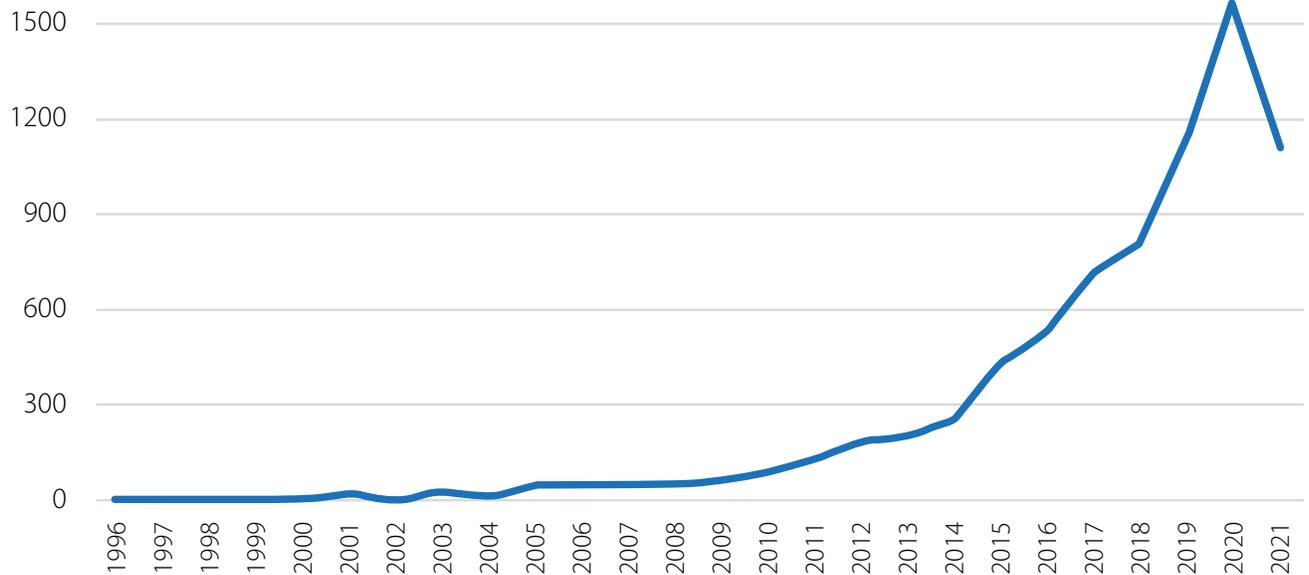
In recent years, research and scientific production in health sciences has increased significantly, which has not been different for nursing. Each year more than two million scientific articles are published, estimating that a health professional should read an average of 17 articles per day to be up-to-date, which may not have the best methodological quality (1). Additionally, health professionals who wish to access evidence may face some limitations: i) difficulties in adequately searching for relevant clinical evidence; ii) language barriers; iii) little experience in critical reading of literature; iv) problems in analyzing the internal and external validity of studies; and v) little or limited time. For these reasons, systematic reviews (SR) and meta-analyses (MA) emerge as a methodological alternative that makes it possible to group, analyze, and assess the quality of available evidence through an exhaustive search of the literature. Furthermore, this research method can produce new knowledge by consolidating findings from previous primary studies (2).

Of note is that, although the first uses of the term SR date back to the 1930s in the 20th century (3), it was not until 1989 that it began to be used more, after the creation of the Cochrane Collaboration (4). The latter aims to promote interest in conducting secondary research to group available primary studies on a particular topic, synthesizing the information and answering a specific research question. The main characteristics of this type of study include assessing the risk of bias and the reproducibility of the search strategy (5).

Because they integrate primary research or studies with different sources of information—which in turn use different methods—, SRs have been considered within the hierarchy of scientific evidence (6). Some authors who use the hierarchy of evidence pyramid classify SRs and MAs of randomized clinical trials as the type of study with the highest level of scientific evidence. However, some researchers recently suggested a new pyramid to hierarchize scientific evidence, in which SRs are a ‘lens’ through which evidence is viewed or applied (7), thus overcoming the limitations of narrative reviews given their high level of subjectivity (8) and making SRs and MAs reliable tools for clinical decision-making. Some SRs include an MA that incorporates a statistical analysis to evaluate the association or combined effect of studies; initially, when MAs arose, they were used to analyze the results of intervention studies (9, 10). The term ‘meta-analysis’ was proposed by Gene V. Glass in 1976, who defined it as “the statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating the findings” (9).

In the last decade, the increase in the publication of SRs and MAs in nursing has been noticeable, as suggested by the results of a search in PubMed for the period between 1996 and July 31, 2021, using the MeSH terms “Nursing,” “Systematic Review” and “Meta-Analysis” and the Boolean operator “AND,” yielding 7,579 results (Figure 1).

**Figure 1.** Increase in nursing publications using the systematic review and meta-analysis methods.



Source: Own elaboration based on a PubMed search.

## Contributions to evidence-based practice

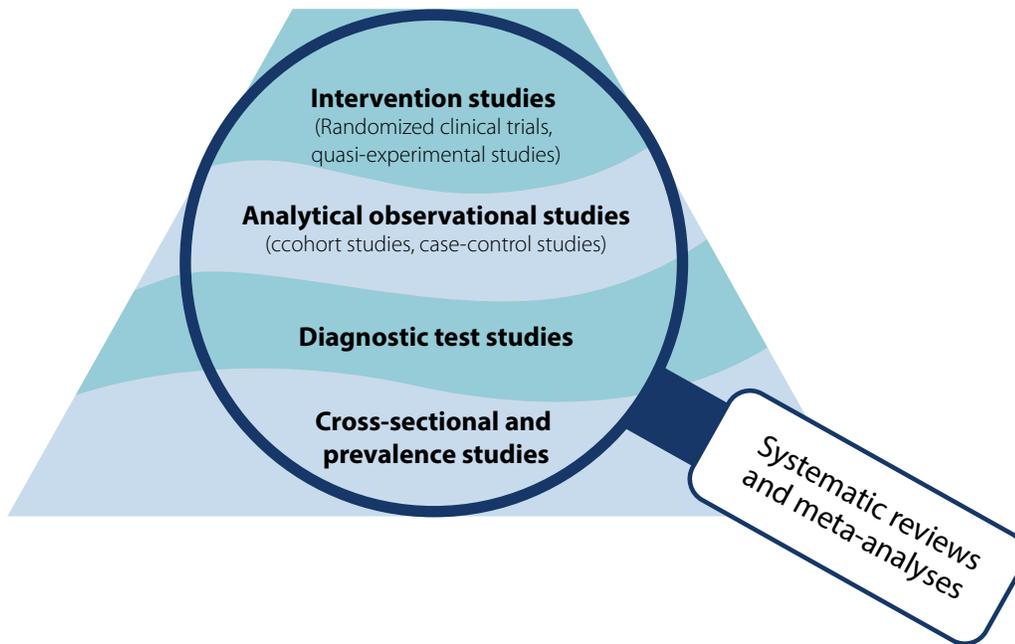
We can currently find nursing professionals who need to bring together practice and scientific development to guide congruent and pertinent care. This constant concern has caused an increase in the production of knowledge on various issues and with various methods that are sometimes challenging to address wholly and individually due to the circumstances and difficulties mentioned above. So, the question arises, what sources of information can be used to access new scientific production comprehensively? The response to this need to gather, integrate, and analyze primary studies results in an SR that synthesizes evidence, increases the validation of individual studies, identifies knowledge gaps, and generates new hypotheses for new studies (11).

One of the fundamental principles of Evidence-Based Practice (EBP) is a hierarchy of reliable evidence based on the methodological design elements of studies, minimizing the effect of bias on the results (12). In the new conceptualization proposed for the prioritization of EBP, SRs and MAs are represented by a ‘magnifying glass’ or ‘lens’ whose interpretation refers to the observation and analysis of available evidence (7) and wavy lines that symbolize the variations that may exist according to the methodological quality of the selected studies (Figure 2).

Accordingly, Evidence-Based Nursing (EBN) promotes the incorporation of research into the care activity by searching for the best available evidence, producing new disciplinary knowledge. The preceding is achieved by employing a systematic and exhaustive litera-

ture search and a more rigorous selection of evidence for a specific problem. In this sense, practice can be much more effective since it is based on critical judgments that help delineate care planning and seek to meet the needs of the patient, family, caregivers, and the community, strengthening the profession of nursing as a discipline and science (6, 13).

**Figure 2.** New proposal for hierarchizing evidence in quantitative research.



Source: Adapted from Murad et al. (7)

Bear in mind that the results of an SR or an MA should not be taken as a rigid guideline since these findings, for example, can be helpful to determine the most appropriate intervention for the patient (14), an approach that favors the applicability and usefulness of results (12). Therefore, besides facilitating the incorporation of studies to the different scenarios where nursing is present, EBN fosters a research interest that leads to holistic care and increases nursing's body of knowledge (13).

## Contributions to postgraduate nursing education

SRs and MAs are increasingly used to adequately review the literature on the study phenomenon of research projects of nursing graduate students (3, 15).

Indeed, several master's and doctorate programs in nursing from various world universities include SR and MA courses in their curricula as an education and training strategy to develop students' skills on research methods. There are divided opinions among researchers and student supervisors at the doctoral level regarding SRs or MAs during doctoral training. One of the arguments for this 'disagreement' is that doctoral students are expected to produce new knowledge by conducting primary studies without synthesizing and

implementing secondary analysis results of individual studies. Furthermore, there seems to be a consensus among researchers in favor, who argue that the inclusion of SR and MA in doctoral programs in nursing would allow well-structured research questions, critical reading skills, better methodological competence, and more significant appropriation of EBN and EBP (3, 15). However, given the advancement and development of SRs and MAs, students, professors, and researchers must update their knowledge about the different stages of this type of study and follow the current methodological recommendations of experts from the Collaboration. Cochrane and the Joanna Briggs Institute.

## Contributions for the practice and improvement of results in patients and nursing professionals

It is increasingly common to find that SRs and MAs are used as mainstays for preparing and updating management protocols and clinical practice guidelines in health institutions. When these SRs and MAs rely on the results of randomized clinical trials, it is possible to ‘close’ the clinical uncertainty about the effectiveness or impact of a given intervention on the patient and their therapeutic process (16). Similarly, the results of SRs and MAs can serve as input for decision-makers to suggest changes in public policies for the benefit of the population. In addition, they support the nursing professional’s endeavors and care itself, reinforcing each role of the discipline and the need to work with multidisciplinary teams. Some examples of recent results from SRs and MAs show the effectiveness of intervention studies in decreasing hospital readmissions in patients with heart failure (17) and improving nursing students’ mental health (18). Other studies use the SR and MA methods to identify the factors that determine the emergence of healthcare-associated infections in hospitalized adults (19) and demonstrate the benefit of lifestyle interventions in women with gestational diabetes (20). Through SRs and MAs, it has also been shown that adequate nursing staffing in health institutions can lead to better results in patients and nurses (21, 22).

## Conclusions

SRs and MAs are considered rigorous research methods, with the possibility of having a high degree of evidence and applicability in various knowledge domains. They are considered of great importance in nursing because they contribute to substantiating care, given their ability to condense scientific evidence, increase the degree of validity of studies, and point out the gaps that need bridging, either because there are not enough studies, because of their low methodological rigor, or because they are inconclusive.

Synthesizing evidence through quality SRs and MAs, following the methodological recommendations of experts (23-25), adds to

the disciplinary development of nursing. Thus, students and professionals should be encouraged to use these methods in education and research and implement the results of SRs and MAs in daily care activities to make better decisions regarding patients' individual needs.

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