

# Systematic Reviews to Strengthen Evidence-based Nursing Practice\*

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**Theme:** Evidence-based practice.

**Contribution to the discipline:** This article provides relevant information on the approach to Joanna Briggs Institute's (JBI) reviews, training programs, and inputs to evidence-based nursing practice. Additionally, it provides critical information about the Cochrane Living Systematic Reviews and Systematic Reviews of Measurement Instruments.

## Abstract

Systematic reviews are essential to developing evidence-based nursing practice. The JBI, formerly known as the Joanna Briggs Institute, has contributed significantly to research through technical training on reviews. Cochrane Living Systematic Reviews and Systematic Reviews of Measurement Instruments have been approaches recently used by the scientific community. The purpose of Living Systematic Reviews is to continuously update priority issues, while Systematic Reviews of Measurement Instruments condense evidence on the validity of measurement instruments. This article overviews the JBI Systematic Review approaches and provides critical information about Cochrane Living Systematic Reviews and Systematic Reviews of Measurement Instruments. The use of these new approaches is necessary to maintain the evidence-based nursing practice and advance nursing knowledge.

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

Evidence-based practice; evidence-based nursing; systematic review; psychometry; nursing.

## 4 Revisiones sistemáticas para el fortalecimiento de la práctica de enfermería basada en evidencias\*

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### Resumen

Las revisiones sistemáticas son esenciales para el desarrollo de la práctica de enfermería basada en la evidencia. El JBI, conocido anteriormente como Joanna Briggs Institute, ha contribuido significativamente al desarrollo de la investigación mediante el entrenamiento técnico sobre revisiones. Las Revisiones Sistemáticas Vivas Cochrane y las Revisiones Sistemáticas de Instrumentos de Medición han sido enfoques recientemente utilizados por la comunidad científica. Las Revisiones Sistemáticas Vivas tienen como propósito generar actualizaciones continuas de temas prioritarios y las Revisiones Sistemáticas de Instrumentos de Medición aportan síntesis de evidencias relacionadas con la validez de los instrumentos de medida. Este artículo es una *overview*, que tiene como objetivo proporcionar una visión general sobre los abordajes de Revisiones Sistemáticas del JBI y brindar informaciones claves acerca de las Revisiones Sistemáticas Vivas Cochrane y las Revisiones Sistemáticas de Instrumentos de Medición. La utilización de estos nuevos abordajes es necesaria para mantener la práctica de enfermería basada en la evidencia y aportar al desarrollo del conocimiento enfermero.

### Palabras Clave (FUENTE: DECS)

Práctica clínica basada en la evidencia; enfermería basada en la evidencia; revisión sistemática; psicometría; enfermería.

# Revisões sistemáticas para fortalecer a prática de enfermagem baseada em evidências\*

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## Resumo

As revisões sistemáticas são essenciais para o desenvolvimento da prática de enfermagem baseada em evidências. O JBI, conhecido anteriormente como Jhoanna Briggs Institute, contribuiu significativamente para o desenvolvimento da pesquisa mediante o treinamento técnico sobre revisões. As Revisões Sistemáticas Vivas Cochrane e as Revisões Sistemáticas de Instrumentos de Medição vêm sendo abordagens recentemente utilizadas pela comunidade científica. As Revisões Sistemáticas Vivas têm como objetivo gerar atualizações contínuas de temas prioritários e as Revisões Sistemáticas de Instrumentos de Medição contribuem com sínteses de evidências relacionadas com a validade dos instrumentos de medida. Este artigo é um overview, que tem como objetivo proporcionar uma visão geral sobre as abordagens de Revisões Sistemáticas do JBI e oferecer informações-chave sobre as Revisões Sistemáticas Vivas Cochrane e as Revisões Sistemáticas de Instrumentos de Medição. A utilização dessas novas abordagens é necessária para manter a prática de enfermagem baseada em evidências e contribuir para o desenvolvimento do conhecimento em enfermagem.

### Palavras-Chave (FONTE: DECS)

Prática clínica baseada em evidências; enfermagem baseada em evidências; revisão sistemática; psicometria; enfermagem.

## Introduction

Systematic reviews (SR) originated between 1970 and 1980 (1) and have considerably influenced the formulation of health policies and clinical decision-making (2). These reviews intend to condense multiple studies rigorously and transparently (3). SRs regularly use the PRISMA guidelines, available on Equator-network (<https://www.equator-network.org/reporting-guidelines/prisma/>), to ensure quality and transparency in reporting these summaries.

SRs synthesize and assess the quality of primary studies and provide reliable and updated information on the evidence available in the scientific literature (4). Among their objectives, SRs aim to comprehensively identify global evidence, confirm current practice, address any variations, identify niches for future research, investigate contradictory results, and produce statements to guide decision-making (2, 3). Therefore, the World Health Organization's (WHO) international recommendations rely on the critical analysis of the evidence provided by SRs, including quality assessment, the degree of data certainty, and evidence synthesis (5).

According to the International Council of Nurses (ICN), evidence-based nursing practice minimizes the gap between theory and practice (6). Thus, SRs are mainstays to transfer the Evidence-Based Nursing (EBN) approach (7), which integrates the best available evidence for health decision-making and considers clinical experience and the values and preferences of individuals, families, and communities (6, 8).

According to the Society of Nursing - Sigma Theta Tau International, the EBN approach directly impacts clinical outcomes because it reduces waiting times, minimizes adverse events, diminishes hospitalization days, and decreases mortality with the consequent cut in health spending (7).

In August 2021, more than 35,500 indexed articles with the term “Evidence-Based Nursing” and more than 17,000 indexed articles with the combination “Systematic Review” AND “Nursing” were recorded in the PubMed database. Likewise, more than 2 million indexed titles with the combination “Systematic Review” AND “Nursing” were registered in Google Scholar. This level of scientific production demonstrates the relevance of SRs for nursing practice and their contributions to evidence-based practice (EBP).

Currently, both the Cochrane Collaboration—through the Cochrane Nursing group (<https://nursing.cochrane.org/homepage>)— and the JBI promote decision-making based on reliable evidence provided by SRs. The UK Cochrane Collaboration created the Cochrane Nursing in 1993 to make, maintain, and disseminate timely, up-to-date, and rigorous SRs in order to minimize bias, ensure quality, prevent duplication of SRs, and promote global involvement of different actors, including scientific communities and citizen participation, such as

the Cochrane Iberoamérica initiative (<https://es.cochrane.org/es/revisiones-cochrane>). In 2009, the Cochrane Collaboration partnered with the JBI through the Cochrane Nursing Care Area (9) to strengthen EBP and enhance JBI indexed databases (<https://crai.ub.edu/es/tags/joanna-briggs-institute-jbi>) and the Cochrane Library (<https://www.cochranelibrary.com/>).

The JBI contributes significantly to SRs by providing methodological support and constant training to clinical nurses, researchers, scholars, and students (10). Recent SR approaches, such as the Cochrane Living Systematic Reviews—designed to insert an ongoing updating model in priority SRs— and the Systematic Reviews of Measurement Instruments—designed to summarize health instruments’ measurement properties—are underutilized resources in nursing.

This article aims to overview the JBI systematic review approaches and provide critical information about the Cochrane Living Systematic Reviews and the Systematic Reviews of Measurement Instruments.

## Materials and methods

This article provides an overview of a specific topic from an expert point of view, supported by informational sources (11). Official documents and websites of the JBI and the Cochrane Collaboration and relevant articles published mainly in the last five years were used. The critical review was provided by a Cochrane author (MFT), a leading representative from JBI Brazil (PVA), and researchers with training in psychometrics (ZLS, DCR). The results were presented based on Clarke and Braun’s (11) thematic analysis and the following phases: i) familiarization with the data, ii) coding, iii) thematic search, iv) thematic review, v) definition and designation of categories, and vi) orderly and coherent writing of relevant findings. The results were grouped into three categories: i) overview of JBI reviews, ii) Living Systematic Reviews, and iii) Systematic Reviews of Measurement Instruments.

### Joanna Briggs Institute Reviews Overview

The JBI is an international organization based at the University of Adelaide (Australia); it comprises a network of health scientists, professionals, researchers, and students committed to health practices based on reliable scientific evidence (12, 13). This organization aims to improve health outcomes through scientific production, training, and dissemination (14). The JBI developed the Evidence-Based Medical Care Model to bring this approach closer to clinical practice, a proposal applicable to all health workers that considers evidence synthesis as an essential component for EBP (15, 16).

The JBI network brings together about 80 centers of excellence and affiliated groups of more than 70 universities and hospitals worldwide, which continually develop methods and tools for rigorous SRs (13, 14). The JBI SRs are designed to answer questions that meet clin-

ical needs and the requirements of healthcare service providers and health policy-makers (17).

The JBI has made methodological recommendations to conduct eleven types of reviews: effectiveness, qualitative studies, economic/cost assessment, prevalence or incidence, diagnostic test accuracy, etiology and risk, textual synthesis, mixed methods, umbrella reviews, psychometric reviews, and scoping reviews (12). For all types of SRs, there is an open access manual to guide them (14).

Regardless of their classification, these reviews are characterized by the systematization of the literature selection process according to the objectives, research question, and inclusion/exclusion criteria stipulated *a priori* in a protocol. These criteria determine the eligibility of studies and provide the guidelines for conducting an exhaustive search of the literature in different databases and informational sources. Subsequently, a screening process is carried out to select the studies to be included, that is, those undergoing quality assessment and data analysis to create an objective synthesis of the results, evaluating the certainty of the evidence and the implications for practice through a transparent and detailed report on the methods used for the review (14).

An SR requires a methodological and technical approach; therefore, the JBI has devised a Comprehensive Systematic Review Training Program (CSRTP) (18) to train researchers, health workers, scholars, and people interested in making SRs using JBI methods. These methods include training in the systematic review software System for the Unified Management of the Assessment and Review of Information (JBI-SUMARI) (10).

The CSRT program has a workload of 40 hours distributed in three modules: Module 1: Introduction to evidence-based healthcare and systematic review of the evidence; Module 2: Making SRs of quantitative evidence; Module 3: SR of evidence generated by qualitative, narrative, and textual research. Course certification is awarded by the JBI (18).

In Latin America, the JBI Brazilian Center for Evidence-Based Medical Attention has continuously trained health professionals interested in using the CSRT program since 2009. This center has trained and certified more than 500 health workers, primarily nurses, in the South American region. In addition, it has launched an Evidence Implementation Training Program (EITP) aimed at health personnel to transform health service providers' care practices (19).

JBI initiatives have improved the training of researchers, systematic and scoping reviewers, consumers, and implementers to strengthen EBN. Currently, the JBI focuses its efforts on creating new affiliated groups in Latin America; the expansion of these groups will undoubtedly improve the results of health practices in this region (17).

## Cochrane Living Systematic Review

Cochrane Living Systematic Reviews (LSRs) are a relatively new proposal, released in 2017 by the Cochrane Collaboration in a provisional guide for LSR pilots, which was subsequently validated and published in 2019 (20). LSRs constitute an approach specially designed to cater to the need for continuous SR updating and publication (21). This approach aims to answer a priority question when the level of evidence is uncertain due to scarce primary studies or a high probability that new evidence will modify current knowledge (21, 22).

LSRs usually predominate in medicine (23), and their application in nursing represents a challenge because this type of approach involves a continuous update that, according to Cochrane, must be monthly (20). Keeping SRs up-to-date bridges knowledge and time gaps in the dissemination of knowledge, especially when the level of certainty is low and the evidence is inaccurate (23).

An LSR proposal can originate from a research question or a pre-existing systematic review. This review will identify the uncertainties of knowledge in priority areas for nursing.

The Cochrane Collaboration has a guide that describes complementary processes to the Cochrane manual (24) designed to make and publish an LSR (20). In general terms, the Cochrane LSR guide describes each stage of the LSR process and recommends tools called ‘enabling,’ which offer resources to supporting the work team in searching and screening primary studies, summarizing, and writing until publication (25). These tools have been designed to offer potential gains in saving time and resources allocated to keep the SR permanently updated (26). Researchers and health workers can find a list of Cochrane enabling tools in the *Systematic Review Toolbox*, available at <http://systematicreviewtools.com/>.

For example, the *Task Exchange* (28) and *Cochrane Crowd* (37) tools are platforms that support the working group because they help organize and distribute tasks in large teams involving researchers and citizen science collaborators (27), which implies active participation of citizens (29). Moreover, machine learning tools such as *RCT Classifier* help collaboratively assess and select the available evidence (30), while text mining tools classify information according to importance, considering the most recent updates in the scientific literature (31, 32). Text mining automates information search and retrieval by identifying patterns or correlations between the terms used in databases (33) through tools such as *MeSH on Demand* (34), designed to generate automatic searches by identifying MeSH (Medical Subject Heading) descriptors in the bibliography published on PubMed. Other similar tools such as *Polyglot Search* (35) and *Medline Transpose* (36) can be used for the same purpose.

For the eligibility and screening stage, machine learning algorithm tools such as *Clasificador de ensayos clínicos aleatorizados* (24) and

*Cochrane Crowd* (37) help identify randomized clinical trials (20). Additionally, full-text report retrieval can be automated and accelerated using tools such as *CrossRef* (38) and *SRA-Helper* (39). Another helpful tool for LSEs is *Rayyan QCRI* (40), designed to speed up the initial selection of abstracts and titles through a semi-automation process, reducing the time used to filter and preselect search results by 40% (40).

For data extraction, tools such as *RobotReviewer* (41), *The Content-Mine* (42), and *Machine-Learning* (20) allow extracting structured data according to the components of a PICO (Population, Intervention, Comparison, Outcome) question and integrating the risk of bias (20). The facilitating tools for evidence synthesis and automatic text generation include *RevMan Replicant* (43) and *RevMan HAL* (44), designed to automatically generate a text for the meta-analysis results section (20).

Finally, to publish an LSR, the reviewers and the editorial team carry out an exhaustive review of the full text when it is the first version. Reviewers check modified sections for subsequent update versions to identify changes and optimize time (20, 45). In this case, three possible situations may occur: i) no new studies are found to include in the review and, in this case, the LSRs will not require a new peer review and may only be submitted for editorial review; ii) there is new evidence, but it is not possible to incorporate it into the review for reasons described in the protocol, or the new evidence will probably not change the results and conclusions of the previous version of the LSR, in which case the update will go through editorial review, while peer review will be optional; iii) new evidence was incorporated, and the update will require a peer review and a new editorial review (46).

## Systematic Reviews of Measurement Instruments

Self-reports are instruments to assess behaviors, attitudes, and values in individuals (47). Health sciences tend to use them more frequently for patient assessment; however, these instruments must be valid and reliable to measure a subjective construct.

An SR of Measurement Instruments aims to evaluate the psychometric properties and validity evidence of instrument validation studies. These reviews facilitate selecting the most appropriate instruments to be employed in academic, clinical, and research contexts based on a given instrument's validity, reliability, and sensitivity evidence. Having validated and reliable measurement instruments allows progress in disciplinary knowledge and its appropriate application to nursing practice. Between 2015 and 2021, more than 2,900 nursing articles related to the validation of instruments derived from construction, translation, and cross-cultural adaptation have been pub-

lished, showing a constant increase in this type of publication and highlighting the need for methods that systematize and optimize the obtaining of results of an SR of measurement instruments. An SR in psychometrics seeks to characterize the articles published on a phenomenon of interest and identify the results on the different measurement instruments used to compare their reliability, validity, and other relevant statistics.

A tool can be used in this type of SR to evaluate article quality: the COSMIN (Consensus-based Standards for the Selection of Health Status Measurement Instruments) *checklist* assesses the methodological quality of studies on psychometric properties and measurement instruments (48). This tool includes the assessment of three domains: validity, reliability, and sensitivity. Validity considers three measurement properties: content, construct (internal structure), and sensitivity. In turn, reliability includes three other measurement properties: internal consistency, reliability (based on inter- and intra-observer test-retests), and measurement error. Finally, sensitivity considers the ability of an instrument to correctly classify a sick individual based on a positive result (48). Specificity is the probability of classifying an individual as healthy through a negative result. This checklist has been used to critically evaluate measurement instruments, strengthen EBP, and encourage the use of measurement instruments, with the consequent standardization of patient assessment for the health and nursing professionals in multiple contexts.

Nonetheless, the critical evaluation of an instrument entails techniques and procedures that ensure their accuracy according to international recommendations. For this, analyzing the validity of the content, internal structure, response processes, measure testing, relationship with other variables, reliability, and invariance has been suggested (49).

For content validity, study reports should incorporate standards for cross-cultural adaptation. In health, a quasi-experimental study proposed five stages for the cultural adaptation of instruments (50); besides, an integrative review showed that 49% of the studies had used these five stages for the cultural adaptation of instruments in nursing (51). Content validity should include the initial translation, the synthesis of translations, a back translation, the committee of specialists' assessment, and the pretest (51). Content assessment can be qualitative (52) or quantitative (53), and authors should use it to adjust the content of the original instrument to the adapted version. Authors must analyze items' semantic, idiomatic, experiential/cultural, and conceptual equivalences in the qualitative assessment, as it shows the significance of dimensions, the relevance of items, and the meaning equivalence of those items. The quantitative assessments advise implementing a content analysis through the Content Validity Ratio (CVR) because it is one of the most rigorous indexes for content evaluation (53).

Concerning the construct validity analysis, currently called 'internal structure' validity, authors should report data inspection techniques, analysis method, structure, extraction, factor retention, and factor loading cut-off points (54, 55). For data inspection, the application of two techniques is suggested, Kaiser-Meyer-Olkin (KMO) and the Sphericity Test, since both tools determine the adequacy of data for factor analysis (56).

For selecting a factor analysis method, authors should have conducted an exploratory factor analysis (EFA) to determine the dimensionality of the instrument. Furthermore, authors should report necessary analysis parameters such as factor loadings of all items, total variance explained, and communalities (49).

It is also advisable that the study reports present the confirmatory factor analysis (CFA) since it is a valuable method to confirm the theoretical model that underlies a measurement instrument. The factorial model should be evaluated using at least three adjustment coefficients (57).

Another relevant aspect is the report of the factorial extraction method, and for this, the Optimal Implementation of Parallel Analysis (PA) is recommended, as it is the most accurate method of factor retention (58). One study suggested resorting to more than one factor retention method since oblique rotation has been applied to psychosocial variables (59).

The report of factor loading cut-off points is relevant since it allows evaluating the factor loadings and total variance explained of a theoretical model using factor loadings  $> 0.40$ , with a total variance explained  $> 60\%$  and communalities  $> 0.40$  (49).

Study reports must describe the coefficient used to estimate reliability. Although Cronbach's alpha ( $\alpha$ ) (60) is frequently adopted, several studies have shown limitations and assumptions of uncorrelated errors, tau equivalence ( $\lambda$ ), and normality (61).

Other recommended analyses to measure reliability are test-retest, equivalent forms, split halves, inter-rater, and KR-20 (Kuder-Richardson 20, for instruments with dichotomous variables); similarly, other authors have suggested other techniques such as Greatest Lower Bound (GLB) or McDonald's Omega ( $\omega$ ) (62). When the total scores of the tests are normally distributed, the coefficient  $\omega$  should be the first option since it prevents the overestimation problems of GLB (62). However, when there is a low or moderate test skew, GLB should be used (63).

The evaluation of invariance is becoming increasingly relevant. Therefore, studies should report its use through  $\Delta CFI$ ,  $\Delta RMSEA$ , or other valuable indices to determine the difference between tested models so that authors can guarantee the invariance of the instrument for a given culture (64).

## Final comments

SRs are essential for health and nursing professionals because they allow the implementation of evidence-based nursing practices through rigorous knowledge synthesis methods.

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## Conflicts of interest

Following the journal's editorial policy, all authors completed a conflict-of-interest statement. The authors stated that they are associated with the JBI or are Cochrane authors. Despite this, the authors affirm that they have no relationships or activities that could influence this publication.

## Ethical considerations

As it was a discussion study, approval by the scientific ethics committee (CEC) was unnecessary.

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