

COMMENTARY

Differentiating between mapping reviews and scoping reviews in the evidence synthesis ecosystem

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Abstract

Background and Objectives: Scoping reviews, mapping reviews, and evidence map methodologies are increasingly used by researchers. The objective of this article is to outline the main difference between these types of evidence synthesis to improve their conduct.

Methods: This article summarizes the key issues facing reviewers, who conduct scoping reviews, mapping reviews, and evidence maps and those who use the results and may engage in consultations during their development.

Results: Several differences exist between the methodologies, and these are in their protocol development, scope, inclusion criteria, data extraction, reporting, and use. Mapping reviews are mainly driven by questions of effectiveness of a particular intervention and hence they use the Participant Intervention Comparator Outcome Study type format similar to systematic reviews of effectiveness. Scoping reviews mostly use the Participant, context, concept (PCC) format, where they map a concept of interest relevant to a particular population in a specific setting and context. Data extraction is limited by only coding of studies and intervention characteristics in evidence maps. The results of the mapping reviews can be used to inform research priorities and research funding, whereas, scoping reviews result may be used to inform policy development by clarifying key concepts and methods, and further research.

Conclusion: We recommend authors who are planning to undertake scoping reviews confirm that their research question can be appropriately answered using a scoping review methodology, however, for broader research questions without the need for an in-depth analysis of the information, we recommend authors to consider mapping reviews. © 2022 Elsevier Inc. All rights reserved.

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1. Introduction

To date, there is a plethora of evidence synthesis guidance and methodologies to characterize and examine the literature relating to a particular topic. Examples of evidence synthesis methods include systematic reviews,

scoping reviews, umbrella reviews, narrative reviews, integrative reviews, and evidence maps [1]. This is in addition to rapid and living reviews that are approaches that can be used for multiple evidence synthesis methods to keep up with the growing literature [2]. Two notable methodologies are often confused and considered similar, and these are scoping reviews and mapping reviews [3,4]. They are both suited to characterizing and mapping a large volume of literature and have overlapping but distinct methodologies [5–7]. Both methodologies are increasingly used in the literature. To date, Google scholar includes more than 250,000 citations that have scoping reviews in the title and more than three million citations make reference to evidence mapping reviews.

When trying to make sense of the expansive literature, the scoping review or mapping review (sometimes termed evidence maps or gap maps) are appropriate types of

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What is new?

Key findings

- There are several differences exist between the methodologies, and these are in their protocol development, scope, inclusion criteria, data extraction, reporting, and use.
- Mapping reviews and evidence gap maps are mainly driven by questions of effectiveness.
- Scoping reviews mostly use the PCC format where they map a concept of interest relevant to a particular population and setting.

What this adds to what is known?

- There is a plethora of evidence synthesis methodologies to characterize and examine the literature relating to a particular topic.
- When trying to make sense of the expansive literature, the scoping review or mapping review are appropriate types of evidence synthesis.

What is the implication and what should change now?

- We recommend authors who are planning to undertake scoping reviews confirm that their research question can be appropriately answered using a scoping review methodology.
- Broader research questions may be better suited for mapping reviews.

evidence synthesis. Confusion exists in the field regarding when which type of review can be used for each type of research questions. The confusion arises from the fact that both methodologies give the impression of mapping evidence addressing a certain topic. Munn et al., 2018 detailed several systematic reviews and provided examples of the various types and when and how they can be used. Most systematic reviews follow a much defined research question with specific populations and settings. They generally aim at answering a specific question about an intervention, a population, diagnosis, and other issues.

Both scoping and evidence mapping reviews have emerged as valid methodologies to address vastly different research questions to systematic reviews. Peters et al., 2021 argued that they should be undertaken first to identify gaps in the literature before undertaking any types of research to avoid replicating work that has already been done before. Both methodologies include mapping the evidence in a specific topic. Although their names suggest that they are the same, they have different methodologies and reasons for undertaking them [5].

It is important to differentiate between the two methodologies to provide clear guidance to researchers and policy-makers about the appropriate methodology to use. Using the right methodology will ensure research questions are adequately addressed and answered to avoid research waste [8]. This also will aid in determining the realization and overall quality of research study and its documentation.

This paper will analyze the differences between mapping reviews and scoping reviews to provide some clear guidance to the evidence synthesis community with examples from the published literature. The methods for scoping reviews will be based on the Joanna Briggs Institute (JBI) guide to scoping reviews, whereas the methods for mapping reviews will be based on the Campbell Collaboration guidance [5,6,9]. A summary of the main similarities and differences for both types of evidence syntheses, compared with systematic reviews is detailed in [Table 1](#).

2. Discussion

This section of the commentary will focus on clarifying the differences in methodologies between mapping reviews and scoping reviews in various aspects including, their scope, research question format, protocol requirements, registration, methodology, searching, inclusion criteria, critical appraisal, data coding and extraction, data analysis, use, knowledge user engagement, limitations, and additional resources for users. It will detail the various sections of each methodology with examples. A simple flow chart representing when each methodology is indicated is presented in [Figure 1](#).

2.1. Scope

Mapping reviews generally have a broad thematic scope covering a range of interventions and outcomes. Previously, researchers mapped topics, such as forest conservation, youth and transferable skills, peacebuilding, attention deficit hyperactivity disorder, amongst other generic topics [10–16]. Examples of platforms that used evidence mapping include the Epistemonikos database, which contains over 115,000 documents in several languages and the number of documents is increasing exponentially [17]. The database presents results from both primary studies and systematic reviews addressing a common research question in a tabular format allowing a visual representation of the evidence. Another useful example of a mapping review is the Sightsaver initiative, which maps evidence related to eye health [18]. This was originally pioneered by the international initiative for Impact Evaluation (3ie) [18]. To date, there are mapping reviews on cataract, diabetic retinopathy, and refractive errors [9,18,19]. Another example of a non-health related mapping review methodology is the one supported by the International Rescue Committee (IRC) [20]. The organization has produced mapping reviews on

Table 1. Differences in methodologies between mapping reviews, scoping reviews and systematic reviews

Parameter	Evidence/gaps mapping reviews	Scoping reviews	Systematic reviews
Objective	Broad objective about where the evidence is ? They do not allow for in depth examination (content) of various aspects of the research question due to vast amount of literature included in this types of reviews.	Broad objective about What the evidence or the methods used in a research areas ? They allow for in depth examination (content) of various aspects of the research question	Focused aim about a given question. For instance the benefit/harms of an intervention or the prevalence of a disease, feasibility, appropriateness and meaningfulness.
A priori review protocol	No (recommended)	Yes (some)	Yes
PROSPERO registration of the review protocol	No (can be registered in Figshare/OSF)	No (can be registered in Figshare/OSF)	Yes
Methodology	Yes	Yes	Yes
Scope	1. To describe the nature, characteristics of research in a particular area or field. 2. To examine the volume of research in a particular area or field 3. To inform research design. 4. to set agenda for future research 5. To identify and analyse knowledge gaps	1. To identify the types of available evidence in a particular area 2. To explain key concepts/ definitions in the literature 3. To investigate how research is conducted on a certain topic. 4. To identify key characteristics or factors related to a concept 5. As a precursor to a systematic review 6. To identify and analyse knowledge gaps	1. Identify the international evidence 2. Identify current practice/ address any variation/identify new practices 3. Recognize and inform areas for future research 4. Investigate conflicting results 5. Generate statements to guide decision-making
Searching of studies	Comprehensive and systematic. Includes searching gray literature. Hand searching is not usually undertaken	Comprehensive and systematic. It includes hand searching and other gray literature depends on the research question	Comprehensive and systematic. It includes various types of evidence to capture all the available evidence related to a particular topic. Hand searching is recommended
Inclusion criteria	Follows the PICO format. P=Participant, I=Intervention, C = comparator, O = outcomes	Follows the PCC format.P=Participants, C=Concept, C = context	Follows the PICO format (P=Participant, I=Intervention, C = comparator, O = outcomes) or other formats depending on the research questions
Explicit, transparent, peer reviewed search strategy	Yes	Yes	Yes
Screening	Yes	Yes	Yes
Mandatory Critical Appraisal (Risk of Bias Assessment)	Optional	Optional, not usually recommended	Yes
Standardized data extraction forms	Limited coding of studies and intervention characteristics	Yes	Yes
Data charting	The use of published frameworks to guide data mapping	Data charting can be inductive or deductive	Depending on the research question

(Continued)

Table 1. Continued

Parameter	Evidence/gaps mapping reviews	Scoping reviews	Systematic reviews
Synthesis of findings from individual studies and the generation of ‘summary’ findings	No	No	Yes
Reporting	Graphical representation of map availability of evidence. Descriptive overview of map. Can use PRISMA-ScR	PRISMA-ScR	Systematic reporting of evidence. PRISMA 2020
Use	To inform research priorities and research funding	To inform research and policy	To inform policy and practice
Stakeholders’ engagement	Recommended	Optional	Optional
Updates	Required	Required	Required

economic wellbeing, safety, power, health, and education [20–24].

Mapping reviews have a broader scope but report a limited range of information about the included reviews and primary studies compared with scoping reviews. The purpose of a mapping review is to present information regarding where the evidence lies as opposed to what the evidence details about a particular topic [9]. This is an important distinction between the two review types [9]. Mapping reviews may tend to classify the evidence which relates to a particular sector or issue, including some reporting of the features (but not detailed content) of the evidence.

Mapping reviews are mainly employed for strategic agenda setting to guide further research. Maps are commonly used, as stated in their name, to depict the number of studies and the subtopics related to a broader theme. For example, the mapping review by Wolffe et al., 2019 detailed how evidence maps are used in decision-making in chemical policy and risk management [25]. The authors included four different maps each detailing various information related to their objective. For example, the first map included locating a particular risk (flame retardants) in the literature (e.g., human blood, breast milk, marine). Another question was identifying the types of toxicity caused by the retardants (e.g., neurotoxicity, carcinogenicity, reproductive toxicity). The maps presented high level data, such as the number of studies reporting on each toxicity rather than what the evidence reported on a particular type of toxicity [25].

On the other hand, scoping reviews can be used to map the evidence related to any topic to allow for further examination of practice, methods, policy, and where (and how) future research needs to be undertaken. They are used to map evidence to enable in-depth examination of the literature for practice, policy, and research relevant to a particular topic. They can also identify where further research is required to be undertaken and examine concepts, definitions, and approaches used in the literature. There are several examples of scoping reviews published in the

literature covering several topics including education, health, and methodology [26–30]. This is also in addition to explaining key concepts/definitions in the literature, as well as investigating how research is conducted on a certain topic. Other indications for scoping reviews include identification of key characteristics or factors related to a concept, their use as a precursor to systematic reviews and their ability to identify and analyze knowledge gaps.

2.2. Methodology

Mapping reviews were first conceptualized in 2003 by a group from the Yale prevention center in collaboration [9]. This was followed by several groups such as, Evidence for Policy and Practice Information and Coordinating Center (EPPI-Center) and the Evidence Based Policing Matrix publishing an evidence mapping methodology, which was adapted by organizations such as the Social Care Institute for Excellence (SCIE) to publish work on a broader field of interest where systematic review methodology was not appropriate for its narrow scope [9]. In 2011, the Gap and evidence Map (GEM initiative) and other organizations such as The International Rescue Committee, Sightsaver, initiated their own methodology of evidence maps and mapping reviews which resulted in summarizing various broad topics. The latest evidence map methodology was piloted and published by the Campbell Collaboration in 2018 [9]. Examples of published mapping reviews addressing broader questions include the following; a review published by Morgan et al., 2019 to identify dietetics workforce preparation and preparedness in Australia [31]. The authors provided a map for dietetics educators and researchers in Australia to guide future research regarding the preparation and preparedness of dietitians. The review will potentially contribute to advancing the Australian dietetics workforce of the future to address the research gaps identified.

Scoping reviews have been called many different terms, such as “mapping review” or “scoping study” [4]. They were first developed in 2005 by Arksey and O Malley and then further developed by Levac in 2010 [32,33]. The



Fig. 1. Flow chart highlighting the difference between the two methodologies.

authors noted inconsistencies in the way scoping reviews were reported and published and recommended further work to be undertaken in the area. A group of researchers from the JBI collaboration extended this work and published their first methodology in 2015 and then further refined and published the latest update in 2020 [5,34]. The JBI scoping review methodology is currently used by thousands of researchers as evidenced by Google Scholar citations since its publication in 2015. An example of a scoping review is the one published by Khalil et al., 2018 to identify the types of medication safety programs used in primary care. The authors were able to extract specific information pertinent to the research question such as the health professionals involved, the outcomes used to examine the effectiveness of these program and the levels of engagement of these programs within the organization specifically whether they addressed an organization, a professional or a structural change [28]. These information would not be possible to identify using a mapping review methodology as it was specific to the research question and required a detailed analysis of the results.

2.3. Searching

The searching for both mapping reviews and scoping reviews is comprehensive to include relevant databases in which the evidence addressing the research questions is likely to be found. The search should identify both published and unpublished literature and follow the same searching strategy as systematic reviews. Presenting the full search strategies for all databases increases transparency and facilitates future updates [35]. Inclusion of an experienced librarian on the team ensures the specificity and sensitivity of the search is balanced and that the appropriate resources are located. Hand searching (i.e., manually flipping through journals) is not common for mapping reviews due to the volume of literature included in the map. However, it is encouraged for scoping reviews to ensure adequate searching is achieved.

2.4. Inclusion criteria

Inclusion criteria is essential as they direct the reader to the scope of the topic and provide a guide to reviewers to make decisions regarding which sources to include or

exclude. Mapping reviews are mainly driven by questions of effectiveness of a particular intervention and hence they mostly use the Participant Intervention Comparator Outcome Study type format similar to systematic reviews of effectiveness. Where (P) refers to participants, (I) refers to a particular intervention, (C) refers to a comparator, (O) refers to outcomes, and (S) refers to study types. Another example of a Participant Intervention Comparator Outcome Study type for an evidence map is published by Miake-Lye et al., 2018 [36]. The authors looked at the effectiveness of interventions to improve emergency department efficiency. The review was used to set priorities to improve the health of veterans seeking emergency care. In this example, the participants are emergency departments, interventions include any initiatives or strategies that were implemented in emergency departments, the comparators included interventions or any other standard care offered, and the Outcomes included patient satisfaction, waiting time, length of stay or any other measure of efficiency [36]. The studies included for this mapping reviews included randomized controlled trials, observational studies, comparative studies and evaluation studies. More recently, few mapping reviews were published addressing topics of prognosis and diagnosis rather than effectiveness and it is anticipated that mapping reviews will be published on other topics in the future [37–40].

The eligibility criteria for scoping reviews are determined by the mnemonic PCC, Participants (P), Concept, (C) and Context (C). Participants refer to the population in question and can include age, sex/gender and other relevant factors to the review question. For example, a scoping review published by Khalil et al. on the characteristics of medications safety programs in primary care detailed the participants as medication safety programs [28]. The authors also provided what constituted a medication safety program to guide their reviewers. The concept usually refers to the interventions or phenomena of interest as detailed in traditional systematic reviews. In the example mentioned above, the concept of interests was the characteristics of the medication safety programs, their structure and the teams involved in delivering them and the outcomes measured to capture the effectiveness of these programs. The Context often refers to the setting and, in this example, it was the primary care setting.

2.5. Critical appraisal

Critical appraisal or risk of bias assessment is generally not recommended but optional for both mapping reviews and scoping reviews [5]. This is because both methods aim to provide a map or overview about the available evidence on a particular topic rather than what the evidence is and hence there is no need to grade the evidence. For this reason, this is considered a limitation of both methodologies as they do not provide any information about grading the evidence. This is partly because of the high volume of studies included in both types of evidence synthesis, as well as the type of question these reviews are addressing, which is often broader than systematic reviews.

2.6. Coding and data extraction

Data extraction is an important stage for both types of evidence synthesis. Extracted data should align with the objectives and research questions of both the mapping review and scoping review. In mapping reviews, coding and data extraction captures the key features of the included studies. For example, the more data captured, the more dimensions the evidence maps can be included. Examples of data could include study characteristics, origin of the study, and high-level information about the types and effectiveness of interventions in various settings [9,36]. The importance of coding the data is that it enables users to locate the evidence underlying the map. In the above example detailing the effectiveness of interventions to improve emergency department efficiency, the data extracted by the authors included the number of studies found for each intervention and the types of studies found. The authors have also extracted data related to the studies showing the length of stay of hospital admissions [36]. The use of pre-established frameworks to guide data extraction is usually used in mapping reviews.

For scoping reviews, data extraction is usually iterative and will include what the evidence reveals. Authors may require adding more information than initially anticipated in their protocol to enable them to address the scoping review question more effectively. The JBI methodology provides an example of a data extraction template that can be adapted by authors depending on the scoping review question [5]. The data extraction in scoping reviews does not necessitate the use of frameworks and can be either undertaken using a deductive or an inductive approach.

2.7. Analysis of the data

Mapping reviews do not require data analysis. However, the key feature of the included studies allows analysis of the map; the more data that is captured the more dimensions a map can have and hence provide information for the reader [9]. More often than not the maps are interactive and are able to address several research questions. They are usually held on interactive platforms, such as Epistemonikos [17].

However, they can also be published in print. Examples of interactive mapping reviews include those published in the areas of attention deficit hyperactivity disorder (ADHD), home care, and evidence-based nursing for treatment of people with schizophrenia [9] mapping reviews may or may not include maps.

Scoping reviews do not include a data analysis step apart from a descriptive analysis of the data and what it describes. The descriptive results can be mapped in various tabular presentations to enable the reader to make sense of the data [5]. Quantitative data can be mapped in way to describe frequencies, proportions, means, medians, percentages, and other descriptive statistics. Qualitative data should not be synthesized or coded using meta-aggregation or meta-synthesis. However, they can be categorized into high level themes to enable the reader to make sense of the results using simple content analysis. This may be relevant if the purpose of the review is to identify or clarify concepts or definitions [5].

2.8. Presentation of the results

Data presentation in mapping reviews usually involves five different types of approaches including a 5D Bubble plot, 3D-matrix, 2D matrix, geographical maps and descriptive reports with or without visualization [9]. The maps are usually depicted to represent the number and types of studies, the effectiveness of interventions using sizing or color coding to differentiate between small and large interventions or effect sizes of interventions. A descriptive summary is usually present to provide more details from the included studies [9].

Scoping reviews are usually presented in a variety of ways such as tabular formats, bubble charts, pie charts, Venn diagrams, and other representations depending on the questions the review is addressing. The visual representation should be also supported by a descriptive summary of the results [5].

2.9. Use

As the name suggests, mapping reviews describe the nature of evidence in a particular area and identify any gaps for further research. A systematic evidence map can support governments in making evidence-informed decisions about implementing programs, by identifying, describing, and assessing the full range of evaluated government policy options to reduce antimicrobial use in humans. They can also be used to describe the characteristics and volume of research in a particular area and inform research design. They are also used by funding organizations for evaluating the need for funded research and finally to inform policy [9].

As for scoping reviews, they are used to clarify concepts and map the evidence regarding a particular topic. Scoping reviews are not used to guide practice as the evidence

included is not appraised, however, they can be used to guide where further research is needed and identify areas where systematic reviews can be undertaken. They can help provide clarity to policy-making by providing details on programs that have been studied or evaluated in the past [5], including refining concepts, identifying conceptual boundaries, and elucidating key elements of interventions.

2.10. Knowledge user engagement

Mapping reviews and evidence gap maps published by the Campbell collaboration requires the search strategy and coding to be done in consultation with librarians, funders, policy makers, and other relevant knowledge users to guide the scope of the map and correctly operationalize the maps to produce the required evidence [5]. Knowledge user engagement in scoping reviews is optional and usually involves practitioners, patients, consumers or other key informants. This step can be undertaken at any stage of the review depending on the need for consultation [5,41,42].

2.11. Limitations

The main limitations of mapping reviews and evidence gap maps include the lack of depth about what the evidence details, the intensity of the resources that need to be involved to complete evidence maps and their limitations to recommendations regarding the effectiveness of interventions. Some mapping reviews and evidence gap maps are able to provide information about effectiveness of a particular intervention or their effect size but they still lack details about the characteristics of interventions and their risk of bias or methodological quality.

As for scoping reviews, most of the published scoping reviews do not include a critical appraisal step, which results in them not being useful to guide practice, however, they can guide further research. Scoping reviews can also be resource intensive depending on the volume of literature included in the final search and the depth of data extraction and coding.

3. Conclusion

We recommend authors who are planning to undertake scoping reviews confirm that their research question can be appropriately answered using a scoping review methodology, however, for broader, high level research questions, we recommend authors to consider mapping reviews. Future studies should explore various research questions using both methodologies.

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