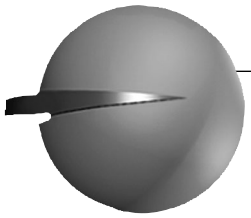

Original Article

An Evidence-Based Approach to Scoping Reviews

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Application of theory, Theory, International health/Global health, Metaanalysis/Data pooling, Outcome evaluation, Research Methods, reviews, scoping

ABSTRACT

Objective: Scoping reviews are used to assess the extent of a body of literature on a particular topic, and often to ensure that further research in that area is a beneficial addition to world knowledge. The aim of this paper reports upon the development of a methodology for scoping reviews based upon the Arksey and O'Malley framework, the Levac, Colquhoun, and O'Brien, and the Joanna Briggs Institute methods of evidence synthesis.

Methods: A working group consisting of members of the Joanna Briggs collaborating organizations met to discuss the proposed framework for the methodology and develop a draft for the scoping review methodology based on the Arksey and O'Malley framework and the work of Levac et al. This was followed by a workshop attended by other members of the organizations consisting of 30 international researchers to discuss the proposed methodology. Further refinement of the methodology was undertaken as a result of the feedback received from the workshop.

Results: The development of the methodology focused on five stages of the protocol and review development. These were identifying the research question by clarifying and linking the purpose and research question, identifying the relevant studies using a three-step literature search in order to balance feasibility with breadth and comprehensiveness, careful selection of the studies to using a team approach, charting the data and collating the results to identify the implications of the study findings for policy, practice, or research.

Linking Evidence to Action: The current methodology recommends including both quantitative and qualitative research, as well as evidence from economic and expert opinion sources to answer questions of effectiveness, appropriateness, meaningfulness and feasibility of health practices and delivery methods. The proposed framework has the potential to provide options when faced with complex concepts or broad research questions.

BACKGROUND

The volume of and access to primary research literature has grown immensely in the last 10 years. Systematic reviews are consequently becoming more common as a method of integrating and presenting the current evidence to inform practice. As the methodology of synthesis evolves, more specific methods of integration have emerged to address the different types of evidence that are included in syntheses. In 2009, Grant and Booth identified 14 different types of literature reviews (Grant & Booth, 2002; Peters et al., 2015a). One of these review types is the "scoping review." Despite the first framework for scoping reviews being published in 2005 (Arksey & O'Malley), scoping reviews are a relatively new methodology that as yet, does not possess a universal definition or definitive method (Anderson, Allen, Peckham, & Goodwin, 2008; Davis, Drey, & Gold, 2009; Levac, Colquhoun, & O'Brien, 2010). Scoping reviews have great utility for synthesizing research evidence and are often used to map existing literature in a given field in terms of its nature, features, and volume (Arksey & O'Malley, 2005). As such, scoping reviews also have been called "mapping" reviews (Anderson et al., 2008; Arksey & O'Malley, 2005; Ehrich, Freeman, Richards, Robinson, & Shepperd, 2002). In general, scoping reviews are commonly used for "reconnaissance" to clarifying the working the definitions and conceptual boundaries of a topic or field (Davis et al., 2009).

Scoping reviews are of particular use when a body of literature has not yet been comprehensively reviewed or exhibits a complex or heterogeneous nature not amenable to a more precise systematic review. Although scoping reviews may be conducted to determine the value and probable scope of a full systematic review, they also may be undertaken as exercises in and of themselves to summarize and disseminate research

findings, to identify research gaps, and to make recommendations for future research (Arksey & O'Malley, 2005).

Two major frameworks of scoping reviews were published in the literature by Arksey & O'Malley (2005) and Levac et al. (2010). The former framework consisted of a six stage methodological structure. The stages included; identification of the research question, searching for relevant studies, selecting studies, charting data, collating, summarizing, reporting the results, and consulting with stakeholders. This framework provided a basic foundation for the conduct of scoping reviews, however; it lacked details regarding the actual methods involved and data analysis. For example, Levac and colleagues (2010) provided an updated methodology for the Arskey and Malley framework based on their personal experience in the rehabilitation field. They attempted to clarify and link the purpose and research question, balance feasibility with breadth and comprehensiveness of the scoping process, and used an iterative team approach to selecting studies and the extraction of data. For the presentation and analysis of data, they also incorporated a numerical summary and qualitative thematic analysis, and consideration of the implications of study findings to policy and practice. Levac et al. invited other authors to further refine scoping reviews methodologies based on their research experiences with a wide variety of topics.

The Joanna Briggs Institute (JBI) is known for its inclusive focus on all types of evidence (Pearson, Wiechula, Court, & Lockwood, 2005). Synthesis is performed on both quantitative and qualitative research as well as evidence from economic and expert opinion sources to answer questions of effectiveness, appropriateness, meaningfulness and feasibility (FAME) of health practices and delivery methods. The FAME model builds upon the work of leaders in the field of evidence-based healthcare (Pearson et al., 2005). The model is inclusive of various types of evidence; and incorporates understandings of how knowledge can be transferred and utilized in healthcare practice. The model attempts to situate healthcare evidence, its role and use within the complexity of practice settings globally (Pearson et al., 2005). The Joanna Briggs Institute has developed a number of methodological approaches for locating, selecting, appraising, extracting, and synthesizing evidence into systematic reviews for use by researchers, clinicians, and consumers at the point of care (Peters et al., 2015a, b).

This paper reports upon the development of a methodology for scoping reviews based upon the Arksey and O'Malley (2005) framework, the Levac et al. (2010) method, and the JBI method of evidence synthesis. An updated scoping review method has the potential to increase the diversity of research evidence available to inform evidence-based practice initiatives.

OBJECTIVE

To develop a methodology for scoping reviews based upon the Arksey and O'Malley framework (2005) method, the Levac et al. (2010) method, and the Joanna Briggs Institute method of evidence synthesis.

METHODS

A working group consisting of methodology researchers who are members of the Joanna Briggs collaborating organizations met to develop a draft for the scoping review methodology based on the Arksey and O'Malley framework (2005) and the Levac et al. (2010) methodologies. The face-to-face meetings took place over 3 days where each stage of the scoping review process was discussed and debated in light of existent literature on scoping review methodologies and the JBI approach to evidence synthesis. This was in addition to several discussions took place via e-mail. This was followed by a workshop run at an international conference to present, discuss, and refine the proposed methodology. This workshop was attended by 50 other international researchers. Further refinement of the methodology to clarify each stage of the review was undertaken as a result of the feedback received from this workshop. The resultant methodology was further discussed by the authors and issues such as review questions, databases searched and results presentation were resolved using consensus. A separate scoping review was also undertaken to validate the proposed methodology. This was followed by several scoping reviews addressing different research questions that were undertaken by members of the collaboration.

RESULTS

The development of the methodology focused on five stages of the protocol and review development as per Levac et al. (2010). These were (a) identifying the research question by clarifying and linking the purpose and research question, (b) identifying the relevant studies using a three-step literature search in order to balance the breadth and comprehensiveness (Aromataris & Riitano, 2014b), (c) careful selection of the studies using a team approach, (d) charting the data in a tabular and narrative format, and (e) collating the results to identify the implications of the study findings for policy, practice, or research as shown in Table 1. Each of these stages is discussed in detail.

Identifying the Research Question by Clarifying and Linking the Purpose and Question

The review objective(s) and specific review question(s) need to be clearly stated. The objectives should indicate what the review project is trying to achieve. The objective may be broad and will guide the scope of the enquiry. The review question(s) should be consistent with the title and direct the development of the specific inclusion criteria. The review question should include information on the participants, the main focus or "concept" and the context of the review.

The relevant characteristics of participants should be detailed, including age and other qualifying criteria that match the review question and identify them as appropriate for the objectives of the scoping review. The main focus or concept examined by the scoping review should be clearly detailed to guide the reviews' scope and breadth. Explanation of the concept may include details that pertain to the "interventions"

Worldviews on Evidence-Based Nursing, 2016; 00:0, 1–6.

Table 1. Proposed Methodology of the Scoping Reviews Based on the JBI Framework of Evidence Synthesis

1. Identifying the research question	Clarifying and linking the purpose and research question
2. Identifying the relevant studies	Using a three-step literature search of in order to balance feasibility with breadth and comprehensiveness
3. Study selection	Careful selection of the studies using a team approach and including all levels of evidence considered by the JBI levels of evidence
4. Presenting the data	Charting the data in a tabular and narrative format where applicable
5. Collating the results	Identifying the implications of the study findings for policy, practice, or research

or "phenomena of interest" that would be specified in greater detail in a systematic review. The concept examined in a scoping review may not be related to interventions or phenomena of interest, and may be instead related to research designs, frameworks, theories or classifications. The standard "outcomes" of a systematic review may be a component of the concept of a scoping review and should be linked closely to the objective and the purpose of the scoping review. The context of a scoping review will vary depending on the objective(s) or question(s). The context should be clearly defined and may include consideration of geographical or locational factors, cultural factors and specific racial or gender-based interests. The context may also encompass details about the specific setting (such as acute care, primary healthcare or community) or discipline (e.g., education, pharmacy or nursing) under examination.

As with systematic reviews, inclusion criteria provide a guide to understand what is proposed by the reviewers and, more importantly a guide for the reviewers themselves to base decisions about the sources to be included in the scoping review. The rationale or justification for each of the inclusion criteria should be explained clearly and thoroughly in the background. Inclusion criteria specifying participants, concept and context should be considered and discussed by the authors to inform the search strategy.

Identifying the Relevant Studies Using a Three-Step Literature Search to Balance Feasibility With Breadth and Comprehensiveness

In line with their broad focus, scoping reviews generally include any existing literature as defined by the JBI levels of evidence, for example, text or opinion literature, guidelines, primary research studies, systematic reviews, meta-analyses, etc. The "inclusion criteria" stated in the review should clearly detail the basis on which sources will be considered for inclusion into the scoping review.

The approach to searching for studies for a scoping review follows the same three-step method as for standard JBI systematic reviews (Aromataris & Riitano, 2014b). The search strategy should be comprehensive in order to identify both published and unpublished evidence. Each stage should be clearly defined in this section of the review. The first stage is a limited search of MEDLINE and CINAHL followed by screening of text words contained in the title and abstract, and the article. The second stage uses all identified keywords and index terms across all included databases. The third stage includes analysis of the reference lists of all identified reports and articles for additional studies. Reviewers should include the languages that will be considered for inclusion in the review as well as the publication date limitations with an appropriate and clear justification for choices.

Careful Selection of the Studies Using a Team Approach

Depending on the question and purpose of the review, authors may find that it is appropriate to search for all sources—quantitative, qualitative, text opinion or opinion summarization (Kim, Park, Vydiswaran, & Zhai, 2008; Pearson et al., 2005) and economic—simultaneously with the one broad search strategy. This inclusive approach is often desirable for scoping reviews to avoid potential omission of important information as the objective of the review is to map the literature on the topic.

Extracting and Charting the Data in a Tabular and Narrative Format

The number of studies identified and selected for inclusion in the scoping review must be reported. There should be a narrative description of the search decision process accompanied by the search decision flowchart (see Figure 1; Aromataris & Riitano, 2014a). The flow chart should clearly detail the review decision process, indicate the results from the search, removal of duplicate citations, study selection, full retrieval, and additions from reference list searching and final summary presentation.

The extraction of data for a scoping review is referred to as "charting the results" and should be a logical and descriptive

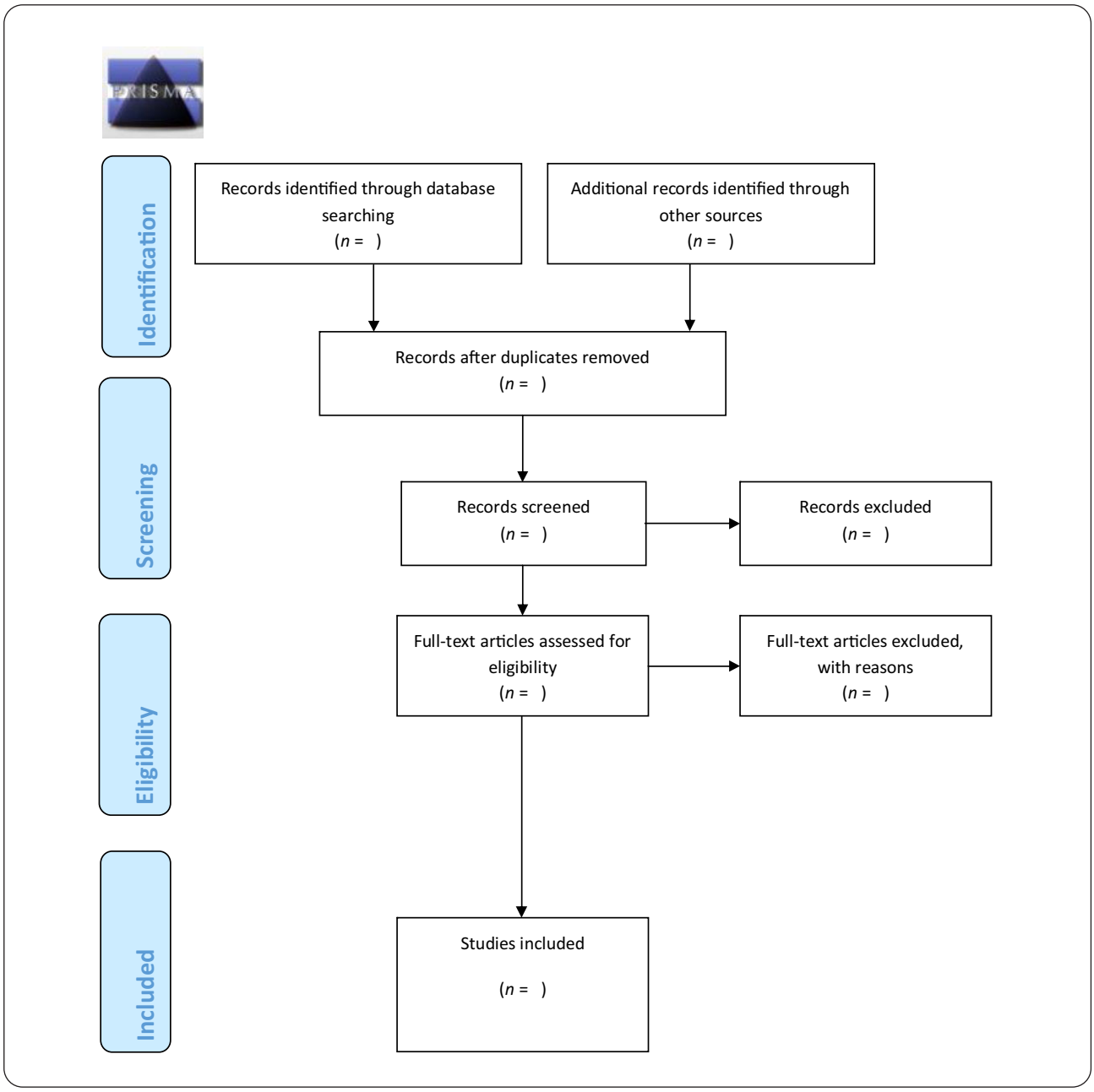

Figure 1. Prisma Diagram.

summary of the results that align to the objectives and questions of the review. A draft charting table or form should be developed as part of the review to record characteristics of the included studies and the key information about the relevance to the review question. Refinement of the charting forms may be required during the conduct of the full review and reviewers may need to trial the extraction form on two or three studies to ensure all relevant results are extracted. The following types of information may be extracted: Author(s), year of publication, source origin, country of origin, aims, purpose, study population and sample size (if applicable), methodology, intervention type and comparator (if applicable), concept, duration of the intervention (if applicable), how outcomes are measured, key findings that relate to the review question.

In a JBI scoping review the results may be presented as a "map" of the data in a logical, diagrammatic or tabular form, or in a descriptive format that aligns to the objectives and scope of the review. The tables and charts may show results as: distribution of studies by year or period of publication (depends on each case), country of origin, area of intervention (e.g., clinical, policy, educational), and research methods. It is up to the reviewers to decide which would most rationally and

Worldviews on Evidence-Based Nursing, 2016; 00:0, 1–6.

clearly illustrate the nature of the results in terms of the objectives and questions of the review. A summary of the results should logically describe the aims or purposes of the included articles, the concepts or approaches adopted in each, and the results that relate to the review questions. For each category, a clear explanation should be provided.

The extracted results may be classified under main conceptual categories depending upon the objective of focus of the review, such as: "intervention type," "study population," "duration of intervention," "aims," "methodology adopted," "key findings," and "gaps in the research."

At the time of protocol development, the reviewers should detail a proposed plan for presenting the results. This may then be further refined toward the end of the review when the reviewers have the greatest awareness of the contents of their included studies.

Collating the Results to Identify the Implications of the Study Findings for Policy, Practice, or Research

When the results are collated, considerations should be given to the conclusions drawn from each included study. Conclusion should be consistent with the review objective or question based upon the results of the scoping review. Following on from the conclusion, clear, specific recommendations for future research based on gaps in knowledge identified from the results of the review can be presented. Authors may be able to make comments about the future conduct of systematic reviews that may be appropriate or primary research in the area of interest. Depending upon the aim and focus of the scoping review, the conclusions may have relevance to practice. Due to the absence of a methodological quality appraisal recommendations for practice may not be able to be developed, however, suggestions could be made based on the conclusions.

DISCUSSION

The need for scoping reviews has emerged as a result of the complexity of the focal concept, the breadth of the research question or the available literature on the topic, or a combination of these factors. There are many concepts in healthcare that are complex concepts in their own right and consequently are difficult to search for and locate in the research literature. Such examples include: The concept of "patient safety" which encompasses multiple definitions of safety and harm and what is meant by these constructs relative to healthcare, or the concept of "self-care" which includes a variety of the aspects such as: antecedents, consequences, barriers to, reasons for engagement in, support of engagement in, reasons for disengagement or nonengagement, and neglect (De Chavez, Backett-Milburn, Parry, & Platt, 2005; Decaria, Sharp, & Petrella, 2012; Ehrich et al., 2002). The difficulty posed by these complex concepts is the location of relevant research on the topic. The first step when dealing with these types of concepts is usually a concept clarification stage that helps to tease out the multiple definitions of the concept and establish the primary definition to be used by the reviewer. To do this, it is imperative to scope the literature broadly—to obtain as wide a sweep of the literature as is possible.

Scoping reviews are designed to address these issues (Pham et al., 2014). The key feature of the scoping review is the breadth and depth (i.e., the wide scope of literature that is searched in order to locate the relevant literature). Scoping reviews do not entail the appraisal and exclusion of articles based on the quality of research methodology. Therefore, they are able to provide the wide spectrum of knowledge and types of evidence that are available on a topic. This is immeasurably useful either when clarifying important concepts or when attempting to gain an understanding of emerging concepts.

The proposed framework for conducting a scoping review detailed a five-step approach to systematically review large volumes of literature relevant to a healthcare topic. It is mainly based on defining and refining three main elements of the review; participants, concept, and context. We also included a detailed approach to searching the literature and selecting the studies that is consistent with the JBI methodology. In order to address the gap in the actual methodologies and data extraction proposed by the Arksey and O'Malley (2005) framework and Levac et al. (2010) methodologies, we proposed a detailed methodology of reporting the findings using tabular forms or other diagrams.

LINKING EVIDENCE TO ACTION

- This study reports on several methodological steps that can enhance the utility of scoping reviews.
- The current methodology recommends including both quantitative and qualitative research, as well as evidence from economic and expert opinion sources to answer questions of effectiveness, appropriateness, meaningfulness, and feasibility of health practices and delivery methods.
- Presenting the findings using tabular forms or other diagrams is encouraged.
- The proposed framework of conducting scoping reviews has the potential to provide options when faced with complex concepts or broad research questions.

CONCLUSIONS

The ongoing interest in evidence-based practice is expected to continue to grow along with the volume of published and grey literature evidence. Although methodologies for the synthesis of evidence in systematic reviews are now relatively sophisticated, much refinement is still possible for the conduct of relatively new techniques such as scoping reviews. The

proposed framework of conducting scoping reviews has the potential to provide options when faced with complex concepts or broad research questions. **WVN**

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