



REVIEW ARTICLE

Same family, different species: methodological conduct and quality varies according to purpose for five types of knowledge synthesis

Andrea C. Tricco^{a,b,*}, Wasifa Zarin^a, Marco Ghassemi^a, Vera Nincic^a, Erin Lillie^a,
Matthew J. Page^{c,d}, Larissa Shamseer^e, Jesmin Antony^a, Patricia Rios^a, Jeremiah Hwee^b,
Areti Angeliki Veroniki^a, David Moher^e, Lisa Hartling^f, Ba' Pham^g, Sharon E. Straus^{a,h}

^aKnowledge Translation Program, Li Ka Shing Knowledge Institute, St. Michael's Hospital, 209 Victoria Street, East Building, Toronto, Ontario M5B 1T8, Canada

^bEpidemiology Division, Dalla Lana School of Public Health, University of Toronto, 155 College Street, 6th Floor, Toronto, Ontario M5T 3M7, Canada

^cSchool of Public Health & Preventive Medicine, Monash University, 553 St Kilda Road, Melbourne, Victoria 3004, Australia

^dSchool of Social and Community Medicine, University of Bristol, Canynge Hall, 39 Whatley Road, Bristol BS8 2PS, UK

^eOttawa Hospital Research Institute, The Ottawa Hospital, 501 Smyth Road, PO BOX 201B, Ottawa, Ontario K1H 8L6, Canada

^fSchool of Public Health, University of Alberta, 116 St & 85 Ave, Edmonton, Alberta T6G 2R3, Canada

^gToronto Health Economics and Technology Assessment, University of Toronto, 27 Kings College Circle, Toronto, Ontario M5S 1A1, Canada

^hDepartment of Geriatric Medicine, University of Toronto, 27 Kings College Circle, Toronto, Ontario M5S 1A1, Canada

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Abstract

Objectives: The aim of the study was to characterize methodological conduct, reporting, and quality of five knowledge synthesis (KS) approaches.

Study Design and Setting: Retrospective analysis of a convenience sample of five published databases of KS approaches: overview of reviews ($n = 74$), scoping reviews ($n = 494$), rapid reviews ($n = 84$), systematic reviews ($n = 300$), and network meta-analyses (NMAs; $n = 456$). Data in the five published databases were abstracted by two reviewers independently, any missing data for this retrospective analysis were abstracted by one experienced reviewer. Methods were appraised using the A MeaSurement Tool to Assess systematic Reviews (AMSTAR) tool. Descriptive analysis was performed.

Results: Reporting the use of a protocol ranged from 4% for rapid reviews to 32% for systematic reviews. The use of two reviewers for citation and full-text screening ranged from 20% for scoping reviews to 60% for NMAs. Data abstraction was performed in duplicate for 11% of rapid reviews and 54% of NMAs, and for risk of bias appraisal, this ranged from 6% for scoping reviews to 41% for NMAs. NMAs had the highest median percentage of maximum obtainable AMSTAR score (64%; Q1–Q3:45–73%), while scoping reviews had the lowest (25%; Q1–Q3:13–38%).

Conclusion: NMAs consistently scored the highest on the AMSTAR tool likely because the purpose is to estimate treatment effects statistically. Scoping reviews scored the lowest (even after adjusting the score for not relevant items) likely because the purpose is to characterize the literature. © 2017 Elsevier Inc. All rights reserved.

Keywords: Knowledge synthesis; Overview of reviews; Scoping review; Network meta-analysis; Rapid review; Systematic review

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* Corresponding author. Tel.: +1-416-864-6060; fax: +1-416-864-5805.

E-mail address: triccoa@smh.ca (A.C. Tricco).

What is new?**Key findings**

- We found differences in methodological conduct and quality across five related knowledge synthesis (KS) methods.

What this study adds to what was known?

- Although all of these methods can be used for synthesizing evidence, it is challenging to quickly determine when a particular method would be the most appropriate for a particular research question. By comparing their definitions and types of research questions examined, we found that the KS methods are useful for addressing different types of research questions.

What is the implication and what should change now?

- Researchers should be aware of the methodological differences across the five approaches to select a KS method that is most suited to their research question and decision-maker needs.

1. Introduction

Knowledge synthesis (KS) can be defined as “the contextualization and integration of research findings of individual research studies within the larger body of knowledge on the topic [1].” KS is a useful tool for many reasons. Reports of KS can be used to make sense of the results of many different study findings for decision-makers, such as patients, health care providers, and policy-makers, who may not have the time or skills to summarize the evidence. Certain types of KS may also allow one to statistically combine the results of multiple studies, with the aim of achieving greater precision in results [2]. Furthermore, these methods can help clarify conflicts in the evidence arising from primary studies.

Within health care, the most common approach to KS for summarizing information on two or more interventions is a systematic review [2]. A systematic review uses explicit methods to summarize evidence in a nonbiased manner [2]. A systematic review may contain a meta-analysis, which combines data across studies to provide a pooled intervention effect measure. Systematic reviews can be used to provide a simple pairwise synthesis on the safety and effectiveness of an intervention [2] and are also now commonly used to synthesize evidence about noninterventions (e.g., diagnosis, etiology, prognosis).

In addition, many other KS methods have emerged to examine the effectiveness and/or harms of interventions [3–8]. Five such KS methods are outlined here. In addition

to systematic reviews discussed above, scoping reviews can be used to map the literature on a given topic and highlight areas for future research [9]. Although scoping reviews can be used to map the literature on an intervention, this method will not provide intervention effect estimates. Overviews of reviews (sometimes referred to as systematic reviews of reviews) can be used to summarize multiple systematic reviews of two or more interventions for the same clinical topic [10,11] as well as provide insight into any observed inconsistent results across reviews [12]. Rapid reviews of two or more interventions are used to tailor the methods according to decision-maker needs when there are time and resource constraints [13]. Rapid reviews are often requested by decision-makers for urgent and emergent decisions, such as infectious disease outbreaks [14]. Network meta-analysis is an extension of pairwise meta-analysis in which three or more treatments can be compared simultaneously [15]. Network meta-analyses are particularly helpful if there is a lack of head-to-head studies examining a particular indication or if a multitude of interventions is available to treat a particular condition.

Although these methods can all be used for synthesizing evidence, it can be challenging to quickly determine when a particular method would be the most appropriate for a particular research question. These five methods are all in the “KS family” [16], yet some could be more alike than others and/or differ in important ways. As such, we aimed to provide clarity by comparing five related KS methods that can be used to synthesize evidence on interventions.

2. Methods**2.1. Study design**

This is a retrospective analysis of a convenience sample compiled from five databases of published studies on KS approaches that can be used to synthesize data on interventions (although other types of evidence can be synthesized) and generally use quantitative synthesis (although qualitative and mixed methods synthesis may also be used) within health (using the World Health Organization definition [17]). Details on how the samples were collected can be found in Fig. 1. Specifically, we included:

- 74 overviews of reviews that were identified after searching multiple databases from 2000 until July 2011 [10];
- 494 scoping reviews identified after searching multiple databases from inception until August 2014 [18];
- 84 rapid reviews that were identified through searching multiple databases from 2008 until May 2013 [19];
- 300 systematic reviews that were identified through a random sample of reviews indexed in Medline during February of 2014 [20]; and
- 456 network meta-analyses identified through searching multiple databases from inception until April 2015 [21,22].

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