Engaging researchers on developing, using and improving knowledge synthesis methods: Introduction to a series of articles describing the results of a scoping review on emerging knowledge synthesis methods

Sharon E. Straus, Monika Kastner, Charlene Soobiah, Jesmin Antony, Andrea C. Tricco

Version Post-print/Accepted Manuscript


Copyright/License This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view a copy of this license, visit http://creativecommons.org/licenses/by-nc-nd/4.0/.

How to cite TSpace items

Always cite the published version, so the author(s) will receive recognition through services that track citation counts, e.g. Scopus. If you need to cite the page number of the author manuscript from TSpace because you cannot access the published version, then cite the TSpace version in addition to the published version using the permanent URI (handle) found on the record page.

This article was made openly accessible by U of T Faculty. Please tell us how this access benefits you. Your story matters.
Engaging researchers on developing, using and improving knowledge synthesis methods: Introduction to a series of articles describing the results of a scoping review on emerging knowledge synthesis methods

Sharon E. Straus, Monika Kastner, Charlene Soobiah, Jesmin Antony, Andrea C. Tricco

PII: S0895-4356(16)00097-4
DOI: 10.1016/j.jclinepi.2016.01.031
Reference: JCE 9079

To appear in: Journal of Clinical Epidemiology

Received Date: 4 December 2015
Revised Date: 4 January 2016
Accepted Date: 29 January 2016

Please cite this article as: Straus SE, Kastner M, Soobiah C, Antony J, Tricco AC, Engaging researchers on developing, using and improving knowledge synthesis methods: Introduction to a series of articles describing the results of a scoping review on emerging knowledge synthesis methods, Journal of Clinical Epidemiology (2016), doi: 10.1016/j.jclinepi.2016.01.031.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.
Engaging researchers on developing, using and improving knowledge synthesis methods: 

Introduction to a series of articles describing the results of a scoping review on emerging knowledge synthesis methods

Sharon E. Straus\textsuperscript{a, b*} email: Sharon.Straus@utoronto.ca
Monika Kastner\textsuperscript{a, c} email: Monika.Kastner@utoronto.ca
Charlene Soobiah\textsuperscript{a, d} email: SoobiahC@smh.ca
Jesmin Antony\textsuperscript{a} email: AntonyJ@smh.ca
Andrea C Tricco\textsuperscript{a, c} email: TriccoA@smh.ca

\textsuperscript{a} Li Ka Shing Knowledge Institute, St. Michael’s Hospital, 209 Victoria Street, East Building, Toronto, Ontario, Canada, M5B 1T8
\textsuperscript{b} Department of Geriatric Medicine, Faculty of Medicine, University of Toronto, 27 King’s College Circle, Toronto, Ontario, Canada, M5S 1A1
\textsuperscript{c} Epidemiology Division, Dalla Lana School of Public Health, University of Toronto, Health Sciences Building, 155 College Street, 6th floor, Toronto, Ontario, Canada M5T 3M7
\textsuperscript{d} Institute for Health Policy, Management and Evaluation, University of Toronto, Health Sciences Building, 155 College Street, Suite 425, Toronto, Ontario, Canada, M5T 3M6

*Corresponding Author:
Sharon E. Straus, MSc, MD
Director, Knowledge Translation Program
Li Ka Shing Knowledge Institute of St. Michael’s Hospital
209 Victoria Street, East Building, Room 716, Toronto, Ontario, Canada, M5B 1W8
Phone: +1-416-864-3068, fax: +1-416-864-5805, e-mail: Sharon.Straus@utoronto.ca
In this article, we introduce a series of articles describing the results of a scoping review on emerging knowledge synthesis methods. Rigorously conducted knowledge syntheses can serve many purposes, including improving the understanding of inconsistencies in evidence, enhancing our knowledge about a particular topic (thereby informing decision making by various stakeholders), and identifying gaps in knowledge that can suggest future research [1, 2]. Such syntheses can also be used as the basis for implementation activities across health care systems and for the creation of various knowledge tools and products, such as clinical practice guidelines, policy briefs, and patient decision aids, among others [3].

Health care knowledge syntheses have often used traditional, methodologically rigorous systematic review methods, such as those used by the Cochrane Collaboration for analyzing evidence on the effectiveness of interventions [4]. However, the health care system increasingly faces multifaceted issues that require an examination of more complex evidence, including integration of evidence from both qualitative and quantitative studies. Consider the following question: In primary care, does implementation of clinical practice guidelines improve clinician behaviour and patient-relevant outcomes? This question could be answered by means of a traditional knowledge synthesis (i.e., systematic review) (and indeed has been [5]), including a comprehensive search and appraisal of the relevant quantitative literature, such as randomised controlled trials, controlled before-and-after studies, and interrupted time series studies. In contrast, consider another question: Which features of a clinical practice guideline (including format, content, language, and quality of evidence) enhance its implementability by practising clinicians and patients across different clinical settings? This second question is more complex and not easily answerable by means of a traditional knowledge synthesis approach. Knowing whether clinical practice guidelines improve clinician behaviour and patient outcomes is the first step in answering this question, but this knowledge cannot inform practice decisions or directly improve patient care. These latter effects rely on an understanding of how, why,
and under what circumstances guidelines improve or do not improve care. Such questions require consideration of different types of evidence (including qualitative and quantitative), different sources of evidence (e.g., human factors engineering, social marketing, health informatics, cognitive psychology), and perhaps different types of knowledge synthesis methods.

Recognition of this complexity in health care research has led to an explosion in the development, conduct, and reporting of novel knowledge synthesis methods, such as realist reviews, meta-ethnographic studies, and meta-narrative reviews [6-9]. Many of these methods can be considered complementary to, and can be conducted alongside, traditional knowledge syntheses. For example, a Cochrane review found that school feeding programs significantly improved the growth and cognitive performance of disadvantaged children, but the results could not be used to guide policy makers as to what intervention would be most effective in specific contexts [10]. The authors therefore also conducted a realist review to understand the success of different school feeding programs for specific populations of children in different circumstances [11].

More frequently, these novel knowledge synthesis methods are being applied independent of traditional reviews, to answer specific questions for various stakeholders, and they are being published in increasing numbers, from 10 in 2000 to more than 300 in 2013 [12]. However, one of the challenges is the sheer number of different methods currently available and the varied terminology in use [6-11, 13, 14]. Overlap among different knowledge synthesis methods certainly exists, and the methods for conducting such studies have not been outlined by the research community as explicitly as has been the case for other synthesis methods (e.g., the intervention, prognostic, effective practice and organisation of care, and diagnostic reviews performed by the Cochrane Collaboration). The situation is further complicated by the fact that many of these methods have been conceived by research paradigms beyond health care (such as those in psychology, education, and philosophy), where different terms and methods are used for similar concepts.
Lack of clarity across the range of knowledge synthesis methods poses substantial challenges for those who conduct and use the resulting knowledge syntheses [13-15]. For researchers who want to tackle complex health care questions, it is often unclear which method will be most appropriate to a particular research question. Peer reviewers for journals and granting agencies struggle to assess the validity of the resulting knowledge syntheses for publication and funding, respectively. Finally, the lack of clarity limits the ability of research users to assess the validity of the results, which impedes interpretation and uptake.

Several international initiatives are now trying to make sense of these methods. The Cochrane Collaboration has established the Qualitative and Implementation Methods Group, conducts these types of knowledge synthesis studies alongside traditional Cochrane reviews of effectiveness [16]. In particular, the group has focused on methods for synthesizing qualitative evidence and integrating such evidence with Cochrane intervention reviews. Wong et al. [17] established the RAMESES (Realist And Meta-narrative Evidence Syntheses: Evolving Standards) projects to develop reporting guidelines for realist reviews and meta-narrative syntheses. They used a modified Delphi approach, referring to recent examples of such reviews to develop their publication standards. Tong et al. [18] developed a reporting guideline for the synthesis of qualitative research studies, entitled ENTREQ. Development of the guideline was based on information gleaned from a search for relevant reviews and methods papers, and the resulting checklist was tested against 40 published syntheses of qualitative research [18]. Gough et al. [14] outlined a strategy to avoid some of the methodological confusion by focusing on three dimensions: the aims and approaches of the review, the structure and components of the synthesis, and the breadth and depth of the work done. For example, identifying the aims of a review would include determining whether the focus is on aggregating or configuring the evidence. Aggregative reviews aim to collect data to describe, ‘add up’, and test predefined concepts (such as the effect of audit and feedback to enhance guideline uptake by primary care clinicians), whereas
configurative reviews aim to interpret and arrange information to allow development of concepts (such as the attributes of a guideline implementation strategy that is based on audit and feedback and targeted to primary care clinicians) [14]. Most recently, participants in a meeting on the complexity of knowledge syntheses outlined research gaps in this area, and a summary of this international meeting was published in this journal [19]. Overall, these complementary efforts have highlighted the need for clarity in the conduct and reporting of knowledge syntheses.

In 2011, some of us began working on a knowledge synthesis to explore the factors that influence guideline implementability, i.e., the second question posed above [20]. We soon realised that we needed a different approach to tackle this question because of the need to search for, appraise, and integrate both quantitative and qualitative literature. Moreover, we wanted to use the evidence to create a conceptual model for implementability that could be used by guideline developers. After reviewing various methodological sources, we decided to take a realist synthesis approach. However, as we immersed ourselves in the literature, we found that the many authors who were using the term “realist synthesis” were using very different methods to conduct their reviews to the extent that we often could not identify the specific methods used for searching and analysing the literature. To make sense of this disparate information, we undertook a scoping review to search for knowledge synthesis methods in use across multidisciplinary fields (including health, education, and psychology), with the aim of comparing and contrasting the different methods and mapping their specific steps. This manuscript serves as an introduction to the results of this scoping review. Our ultimate goal is to create a methods manual and toolkit for researchers wanting to use these emerging knowledge synthesis methods (to help them match research questions with appropriate methods) and for end users of the reviews (to help them understand how to appraise and interpret the results).

For our scoping review [15], we used the approach suggested by Arksey and O’Malley and refined by Levac and colleagues [21], as well as others [22], incorporating knowledge exchange...
sessions with various stakeholders at several points in the process. For example, we held a workshop on knowledge synthesis methods during the 2011 Cochrane Colloquium to elicit interest in the topic and feedback on our approach. We also coordinated a workshop at the 2012 Global Symposium on Health Systems Research in Beijing, China, to elicit feedback on the taxonomy and definitions of the various syntheses identified in our scoping review.

In a series of five articles (Box 1) [12, 23-26], we will describe our approach to this scoping review and the results of our work. The first manuscript describes the overall results of the scoping review of emerging knowledge synthesis methods, identifying 25 methods and highlighting overlap across the methods’ descriptions [23]. Two main distinctions were noted, specifically, methods for integrating qualitative and quantitative evidence and for generating theory. The second manuscript summarises the seven knowledge synthesis methods identified for integrating qualitative and quantitative evidence [24]. Guidance on the complete synthesis approach was not provided for most of the methods that we identified. The third manuscript outlines nine knowledge synthesis methods for generating theory [25]. Most of these methods were not transparent or reproducible. The fourth manuscript provides a framework with definitions, descriptions and examples of all unique knowledge synthesis methods that we identified [26]. In particular, it provides recommendations on when and how these emerging knowledge synthesis methods can be used to answer relevant questions. The fifth manuscript is a bibliometric analysis of emerging knowledge synthesis methods literature and highlights the growth in publication of these articles and the lack of clarity of relevant search terms [12]. This latter manuscript offers suggestions for researchers and journal editors to enhance clarity of terminology used for the various knowledge synthesis methods. Across these articles, we will not only describe the knowledge syntheses methods but their relative strengths and weaknesses, and will explain how to match a research question to a potential method. We invite readers to provide feedback on our results. In particular, we would like to engage this journal’s readers in discussions of how to further
modify our approach. We therefore look forward to ongoing debate and discussion on this evolving topic.
Box 1. Articles in this Series

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper 4: Kastner M, Antony J, Soobiah C, Straus SE, Tricco AC. Conceptual recommendations for selecting the most appropriate knowledge synthesis method to answer research questions related to complex evidence.</td>
</tr>
<tr>
<td>Paper 5: Perrier L, Lightfoot D, Straus SE, Kealey MR, Tricco AC. Knowledge synthesis methods research: a bibliometric analysis found relevant MeSH were not applied or not available for emerging knowledge synthesis methods.</td>
</tr>
</tbody>
</table>
References


[12] Perrier L, Lightfoot D, Straus SE, Kealey MR, Tricco AC. Knowledge synthesis methods research: a bibliometric analysis found relevant MeSH were not applied or not available for emerging knowledge synthesis methods. In press at the Journal of Clinical Epidemiology.


