10-1-2017

AHRQ Series on Complex Intervention Systematic Reviews-Paper 1: An Introduction to a Series of Articles that Provide Guidance and Tools for Reviews of Complex Interventions

Jeanne-Marie Guise  
*OHSU-PSU School of Public Health*

Christine Chang  
*Agency for Healthcare Research & Quality*

Mary E. Butler  
*University of Minnesota*

Meera Viswanathan  
*RTI International*

Peter Tugwell  
*University of Ottawa*

Let us know how access to this document benefits you.

Follow this and additional works at: [https://pdxscholar.library.pdx.edu/sph_facpub](https://pdxscholar.library.pdx.edu/sph_facpub)

Part of the [Medicine and Health Sciences Commons](https://pdxscholar.library.pdx.edu/sph_facpub)

Citation Details


This Article is brought to you for free and open access. It has been accepted for inclusion in OHSU-PSU School of Public Health Faculty Publications and Presentations by an authorized administrator of PDXScholar. For more information, please contact pdxscholar@pdx.edu.
1. Introduction

Issues of complexity are taking primacy as research increasingly reflects the complexity of the world around us. Although advances in science have resulted in dramatic improvements in health and longevity worldwide, there is increasing recognition that the effectiveness even of apparently simple interventions is often influenced by complex interplays of individual characteristics, social determinants, the health care delivery system, and the interventions themselves. Systematic reviews of topics, such as slum upgrading [1,2], behavioral interventions for autism [3,4], smoking cessation in pregnancy [5], and the integration of mental health in primary care [6,7], illustrate that the boundaries of traditional reviews and review methods are being expanded and that reviewers are in need of guidance and tools to address this new approach.

When the methods for conducting systematic reviews were originally developed, the process of reviewing the literature was treated as relatively straightforward. Complexity existed, but reviewers often tried to simplify this complexity to group studies and in attempts to make comparative claims. In general, the systematic reviews and primary research included in systematic reviews approached research from a classic reductive philosophic and methodologic stances. Increasingly, people interested in adopting published interventions from reviews have found that this reductive stance eliminates details that are critical for them to understand whether the intervention is feasible and likely to work in their context, with their populations, and at what cost. As the fundamentals of evidence-based practice are now established, complexity has moved to the forefront.

In order for systematic reviews to address this complexity, all stages of the review, including question formulation, framework development, selection of review and analytic methods, and synthesis, need to account for...
Definition of complex interventions

All complex interventions have two common characteristics; they have multiple components (intervention complexity) and complicated/multiple causal pathways, feedback loops, synergies, and/or mediators and moderators of effect (pathway complexity). In addition, they may also have one or more of the following three additional characteristics; target multiple participants, groups, or organizational levels (population complexity); require multifaceted adoption, uptake, or integration strategies (implementation complexity); or work in a dynamic multidimensional environment (contextual complexity).

1.3. How do I know if an intervention is complex?

To judge whether an intervention is simple or complex, systematic reviewers should specify clearly what the intervention is. Depending on how the intervention is framed, the same core component could potentially be reviewed as a simple or complex intervention. A complex intervention involves, at minimum, multiple components and a complex pathway. For example, if the focus of the review is the efficacy of taking aspirin after a myocardial infarction compared with another pill, placebo, or no treatment, this would not be a complex intervention. Although aspirin may act through complex biologic pathways, biologic or...
physiologic complexity is not considered sufficient to categorize an intervention as complex for the purposes of a systematic review. However, a review question about how to increase adherence with daily aspirin after a myocardial infarction would be complex. Because behavioral interventions often use multiple approaches and target systems or multiple agents (e.g., providers, patients, family members, etc), they are commonly considered complex. A second example of a complex intervention would be personal protective equipment. A systematic review of the efficacy of one type of mask compared with another may reasonably treat the intervention as simple. In contrast, systematic reviews focusing on effectiveness in public health settings and feasibility of uptake should consider the intervention to be complex: the effectiveness of the intervention depends on the context in which the personal protective equipment will be implemented, whether agents are available to perform fittings and testing, whether there are mechanisms available to disseminate the personal protective equipment items, whether training is required, and the ability of people to get to a place for training, and others. Each of these considerations can be deemed a component in this system.

<table>
<thead>
<tr>
<th>Key concept</th>
<th>Article title</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>AHRQ series on complex intervention systematic reviews—paper 1: an introduction to a series of articles that provide guidance and tools for reviews of complex interventions</td>
<td>Provides an introduction and overview of the AHRQ series on complex intervention systematic reviews. This article discusses the process used to develop the series, provides a consolidated definition of complex interventions, and provides questions systematic reviewers can ask to determine whether the subject of their review is a complex intervention.</td>
</tr>
<tr>
<td>Developing protocols for systematic reviews and meta-analyses of complex interventions Scoping questions</td>
<td>AHRQ series on complex intervention systematic reviews—paper 2: defining complexity, formulating scope, and questions [30]</td>
<td>Offers guidance on the earliest stages of a review, particularly on stakeholder engagement and scope and key question formulation. Complex intervention problem formation is an iterative and emergent process that requires careful articulation before the literature review.</td>
</tr>
<tr>
<td>Developing frameworks</td>
<td>AHRQ series on complex intervention systematic reviews—paper 3: adapting frameworks to develop protocols [31]</td>
<td>Examines how to use frameworks to elaborate the research questions and define the study eligibility criteria (i.e., whether and why/how it works) and an analytic framework (or other visual model) to clearly depict how the analysis will address the key research questions, taking into account how the interventions may affect outcomes of interest.</td>
</tr>
<tr>
<td>Developing analytic plans for systematic reviews of complex interventions Best practice analytic methods</td>
<td>AHRQ series on complex intervention systematic reviews—paper 4: selecting analytic approaches [32]</td>
<td>Describes important considerations for choosing analytic approaches for review questions about complex interventions.</td>
</tr>
<tr>
<td>Selecting analytic approaches</td>
<td>AHRQ series on complex intervention systematic reviews—paper 5: advanced analytic methods [33]</td>
<td>Introduces analytic methods that can address four broad questions about complex interventions: (1) How effective is the intervention? (2) How well does the intervention work for whom in what contexts? (3) What happens when the intervention is implemented? and (4) What decisions are possible given the results of the synthesis?</td>
</tr>
<tr>
<td>PRISMA-CI PRISMA-CI checklist</td>
<td>AHRQ series on complex intervention systematic reviews—paper 6: PRISMA-CI extension statement &amp; checklist [34]</td>
<td>Provides a template for authors to use when reporting systematic reviews of complex interventions. It is intended to improve the transparency and scientific merit of systematic reviews of complex interventions.</td>
</tr>
<tr>
<td>PRISMA-CI explanation and elaboration</td>
<td>AHRQ series on complex intervention systematic reviews—paper 7: PRISMA-CI elaboration &amp; explanation [35]</td>
<td>Explains the meaning and rationale for each PRISMA-CI checklist item and provides examples for further clarity on their use.</td>
</tr>
</tbody>
</table>

Abbreviations: AHRQ, Agency for Healthcare Research and Quality; PRISMA-CI, Preferred Reporting Items for Systematic Reviews and Meta-analyses of Complex Interventions.
intervention. Commonly, public and population health, community and system-level interventions, and those aimed at behavior change are more likely to be complex than simple.

1.4. Series overview

The seven articles in this series reflect and distill the discussions from the in-person meeting and follow-up workgroups on tools and approaches to systematic reviews of complex interventions (Table 1).

The first three articles address how systematic reviews for complex interventions are conceptualized and operationalized for the protocol [30, 31]. The next two articles discuss how to choose appropriate analytic methods to implement analyses of complex interventions [32, 33]. The final two articles [34, 35] describe proposed reporting elements for systematic reviews of complex interventions.

Methods and approaches described in this series are intended to help researchers design and conduct systematic reviews of complex interventions to better answer important clinical, policy, and research questions; improve their usefulness; and improve health care and health outcomes. However, as the number of methods and approaches for reviewing complex interventions proliferate in a rapidly evolving field, unanswered questions remain about the relative value of these methods. Widespread adoption of new methods and transparency of reporting can help solidify our understanding of the best methods for complex interventions, advance the field, and help better answer pressing real-world questions. Recognizing that this is a rapidly evolving field, the complex interventions working group intends to monitor the application of these tools and modify them as needed.

Acknowledgments

The authors thank Terri Pigott for her participation and valuable contributions in planning the conference and this collection of work, all members of the complex interventions working group for their participation, and valuable intellectual discussions and contributions to this series; Karli Kondo and Kelly Vander Ley for their assistance in planning the in-person conference, Makalapua Motu’apauka for her tireless work coordinating all planning committee meetings, in-person conferences, and all workgroup activities, and both Makalapua Motu’apauka and Lyndzie Sardenga for their assistance on all documents and coordinating external reviews and comments. We thank Stephanie Chang and Arlene Bierman from AHRQ for their continued support and valuable input.

References


