ORIGINAL ARTICLE

Lack of transparency in reporting narrative synthesis of quantitative data: a methodological assessment of systematic reviews

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Abstract

Objective: To assess the adequacy of reporting and conduct of narrative synthesis of quantitative data (NS) in reviews evaluating the effectiveness of public health interventions.

Study Design and Setting: A retrospective comparison of a 20% ($n = 474/2,372$) random sample of public health systematic reviews from the McMaster Health Evidence database (January 2010−October 2015) to establish the proportion of reviews using NS. From those reviews using NS, 30% ($n = 75/251$) were randomly selected and data were extracted for detailed assessment of: reporting NS methods, management and investigation of heterogeneity, transparency of data presentation, and assessment of robustness of the synthesis.

Results: Most reviews used NS (56%, $n = 251/446$); meta-analysis was the primary method of synthesis for 44%. In the detailed assessment of NS, 95% ($n = 71/75$) did not describe NS methods; 43% ($n = 32$) did not provide transparent links between the synthesis data and the synthesis reported in the text; of 14 reviews that identified heterogeneity in direction of effect, only one investigated the heterogeneity; and 36% ($n = 27$) did not reflect on limitations of the synthesis.

Conclusion: NS methods are rarely reported in systematic reviews of public health interventions and many NS reviews lack transparency in how the data are presented and the conclusions are reached. This threatens the validity of much of the evidence synthesis used to support public health. Improved guidance on reporting and conduct of NS will contribute to improved utility of NS systematic reviews. © 2018 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).

Keywords: Systematic review; Meta-research; Methodology; Narrative synthesis; Evidence synthesis

1. Introduction

Well-conducted systematic reviews have an important role in supporting evidence-informed policy and practice [1,2]. The value of systematic reviews in supporting decision-making, compared with other types of review, is their use of a transparent method to draw conclusions based on the best available evidence. While meta-analysis is a cornerstone of many systematic reviews, statistical pooling may not always be appropriate or feasible due to high levels of heterogeneity or lack of available data to calculate standardized effect estimates (e.g., standardized mean difference, odds ratio, risk ratio). Heterogeneity, both statistical and methodological, is a common issue for public health reviews where it is typical to include diverse study designs, outcomes, contexts, populations, and interventions [3]. When meta-analysis is inappropriate or not possible, data may be synthesized narratively; this method is relied on heavily by those conducting reviews addressing public health issues. For example, 74% of National Institute for Health and Care Excellence public health appraisals included NS [4].

Concerns have been raised that narrative synthesis of quantitative data (NS) lacks transparency and has substantial potential for bias [5−7]. Specifically, there is concern that conclusions of NS are based on subjective interpretation [5,7] with a risk of over emphasizing selected results without clear justification. This lack of transparency limits assessment of the level and sources of bias in NS [5], threatens the replicability of the method, and may ultimately threaten the validity and value of review findings based on NS. However, empirical evaluations of the reporting and adequacy of NS are lacking. This article presents the findings of a

What is new?

Key findings

- Based on a sample of public health reviews, it is apparent that, despite being commonly used, narrative synthesis often lacks transparency.

- Synthesis methods are rarely reported, and presentation of data in the review often does not facilitate clear links between visual presentation of the data and the text.

What this adds to what was known?

- This is the first study to assess the adequacy of reporting of narrative synthesis of quantitative data in systematic reviews.

What is the implication and what should change now?

- Substantial improvements in clarity of reporting of narrative synthesis are required. There is a need for existing guidance to inform the development of a clear and concise reporting guideline for narrative synthesis.

- Greater transparency when reporting narrative synthesis will allow end users including practitioners and policy decision-makers to have greater confidence in the results of systematic reviews that use narrative synthesis.

systematic review that aimed to establish current practice and adequacy of reporting and conduct of NS of quantitative data in public health systematic reviews.

2. Methods

To assess reporting and conduct of NS, we identified a random sample of recent public health systematic reviews and systematically assessed the adequacy of reporting and conduct by benchmarking against available published guidance. The methods of this review are described below; further details are available in the review protocol [8].

To establish existing guidance on NS, we consulted publications, textbooks, and methods articles; these are outlined in Box 1, along with the key elements of NS from the most comprehensive guidance provided by Popay et al. [9] For the purposes of this work, we used the definition of NS as proposed by Popay et al. in the UK's Economic and Social Research Council (ESRC) guidance:

> "Narrative synthesis refers to an approach to the systematic review and synthesis of findings from multiple studies that relies primarily on the use of words and

Box 1 Overview of ESRC guidance on narrative synthesis [9] and additional key sources consulted to establish best practice in narrative synthesis

The most comprehensive guidance on the conduct and reporting of NS was published in 2006 [9], commonly known as the "ESRC guidance on NS". The general elements of narrative synthesis set out by Popay et al. [9] (page 12—16):

1. Developing a theoretical model of how the interventions work, why, and for whom.
2. Developing a preliminary synthesis: develop an initial description of the results of included studies. Tools and techniques suggested: textual descriptions of studies, groupings and clusters, tabulation, transforming data into a common rubric, vote counting, translating data thematic analysis, content analysis.
3. Exploring relationships in the data: examine emerging patterns in data to identify any explanations for differences in direction or size of effect across included studies. Tools and techniques suggested: graphs, frequency distributions, funnel plots, forest plots, moderator variables and sub group analysis, idea webbing and conceptual mapping, translation reciprocal and refutational, qualitative case descriptions, investigator/methodological triangulation, conceptual triangulation.
4. Assessing the robustness of the synthesis product: trustworthiness of the synthesis, incorporating the methodological quality of the included studies and the methods used in the synthesis. Tools and techniques suggested: weight of evidence, best evidence synthesis, use of validity assessment, reflecting critically on the synthesis process, checking the synthesis with authors of primary studies.

Additional sources consulted to develop data extraction tool:

5. An introduction to systematic reviews [10].
6. Systematic reviews in the social sciences: a practical guide [11].
7. Synthesizing qualitative and quantitative health evidence: a guide to methods [12].
8. Guidelines for systematic reviews of health promotion and public health interventions [13].
9. Cochrane handbook for systematic reviews of interventions [5].
10. WHO Handbook for guideline development [14].

text to summarise and explain the findings of the synthesis. Whilst narrative synthesis can involve the manipulation of statistical data, the defining characteristic is that it adopts a textual approach to the process