

“Brimful of STARLITE”: toward standards for reporting literature searches

Andrew Booth, MSc, MCLIP, Reader in Evidence Based Information Practice and Director of Information Resources, A.Booth@sheffield.ac.uk
School of Health and Related Research (ScHARR), University of Sheffield, Regent Court, 30 Regent Street, Sheffield, S1 4DA, United Kingdom

Context: Systematic reviews of qualitative research studies extend understanding of health care beyond effectiveness to acceptability and user views.

Objective: The paper surveys reports of qualitative systematic reviews and, by characterizing techniques used to identify articles for inclusion, proposes standards for reporting of literature searches.

Data Sources and Study Selection: A search of MEDLINE was performed for qualitative systematic reviews published from 1988 to December 2004, supported by searches of CINAHL, Web of Knowledge (including the Science and Social Sciences Citation Index), and the Cochrane Methodology Register, and Internet searches using the Copernic Agent Professional meta-search agent. Studies were included if they used techniques of qualitative synthesis in reviewing research studies in health care. Narrative reviews were excluded.

Data Extraction: Authors, year of publication, sampling strategy, databases, keywords, and other approaches used were extracted.

Data Synthesis: Sixty-four studies were identified, and forty-three met inclusion criteria for this review. A summary of searching methods was produced and used to construct the STARLITE mnemonic (sampling strategy, type of study, approaches, range of years, limits, inclusion and exclusions, terms used, electronic sources).

Conclusions: Considerable variation exists in search methods for qualitative systematic reviews. While diversity in methods is appropriate during the development of review methodology, major concerns remain about the absence of an accepted standard and the consequent poor quality of reporting.

BACKGROUND

Recent years have seen increasing recognition of the potential contribution of qualitative health research to informing health policy and clinical practice [1, 2]. Qualitative approaches allow the researcher to explore the richness and complexity of human experience in a given context [3]. In representing human experience, this type of research provides important information about such aspects as the appropriateness of care and the impact of illness. As such, it complements the role of quantitative research where the focus is often on improved understanding of the effectiveness of health care. Qualitative research may also give consumers “a voice in the decision-making process through the documentation of their experiences, preferences, and priorities” [2]. Specifically, in health technology assessment (HTA), a properly employed qualitative approach can provide “valuable information on the implementation and impact of health technologies on both health professionals and patients” [4]. In particular, the value of systematic reviews of qualitative research that synthesize the findings of multiple studies

Highlights

- Systematic reviews of qualitative research studies are limited by poor quality reporting of search methods.
- Standards for reporting literature searches must acknowledge the demands of both quantitative *and* qualitative systematic reviews.
- The mnemonic STARLITE (sampling strategy, type of study, approaches, range of years, limits, inclusion and exclusions, terms used, electronic sources) may be used to convey the essential elements for reporting literature searches.

Implications

- There is a pressing need to achieve international consensus about standards for reporting literature searches.
- Further work needs to define the contents of each proposed element and the ways these elements are to be evaluated.
- Librarians have a key role in defining standards for systematic reviews and their subsequent reporting.



Supplemental electronic content is included with this paper on PubMed Central.

covering the same topic is being increasingly acknowledged.

Systematic reviews—in which evidence has been systematically identified from comprehensive searches of the published and unpublished literature, appraised for quality, and then synthesized to produce generalizable messages—have become a key tool in the development of an evidence base [5]. A qualitative systematic review, also referred to as a qualitative meta-synthesis, is a method for integrating or comparing the findings from qualitative studies [6]. The accumulated knowledge resulting from this process may lead to the development of a new theory, an overarching “narrative,” a wider generalization, or an “interpretative translation” [7]. Whereas a quantitative meta-synthesis, or meta-analysis, aims to pool the numerical results of individual quantitative studies, a qualitative meta-synthesis looks for “themes” or “constructs” that lie in or across individual qualitative studies. The goal of such a qualitative meta-synthesis is not aggregative in the sense of “adding studies together,” as with a meta-analysis. On the contrary, it is interpretative in broadening understanding of a particular phenomenon [8]. Within this broader category of “qualitative meta-synthesis,” the narrow term “meta-ethnography” [9] refers to the specific method of data synthesis that has been most widely adopted in the literature to date. For example, Paterson and colleagues have identified thirty-eight studies examining the firsthand experience of living with diabetes [10]. They have found that the prevailing metaphor was the concept of balance and specific subthemes identified across multiple studies included “knowing one’s body,” “learning how to manage diabetes,” and “fostering supportive, collaborative relationships with others.”

Compared to systematic reviews of the quantitative research literature, qualitative systematic reviews in health care are a much more recent phenomenon. Whereas quantitative reviews are conducted according to such guidelines as the Cochrane Handbook [11] and the National Health Service (NHS) Centre for Reviews and Dissemination report number 4 [12], similar accepted principles for qualitative reviews are lacking [13]. The second edition of published NHS Centre for Reviews and Dissemination guidelines does cater superficially to qualitative research in the context of effectiveness research, but it is widely acknowledged that qualitative reviews may be used for a much broader range of purposes, which may or may not include the “typical” effectiveness question [12]. Included in a quantitative legacy that is being increasingly challenged by qualitative systematic reviewers are such acknowledged systematic review mechanisms as checklists [6, 14–16] and a hierarchy of evidence [17].

Notwithstanding considerable progress, vigorous debate exists as to whether it is appropriate to apply conventional systematic review techniques, developed primarily for quantitative systematic reviews and meta-analyses, to reviews of qualitative research [18]. Some commentators argue that it is more appropriate to develop and apply methods analogous to those

used in conducting primary qualitative research, employing familiar techniques such as purposive sampling and theoretical saturation in preference to quantitative-centric review methods [19, 20]. Regardless of one’s stance on such issues, applying such methods to qualitative research presents significant philosophical and practical challenges [21].

This comparative immaturity of methods for qualitative systematic reviews is mirrored in the specific context of the identification of studies. Whereas techniques for retrieval of quantitative study designs (such as randomized controlled trials) are relatively far advanced, it is only comparatively recently that attention has started to be focused on methods for identifying qualitative research studies [2, 22–24]. This deficiency is fittingly signaled by the fact that a chapter on searching for qualitative research has not yet been included in the international HTA community’s otherwise impressively comprehensive *E-text on Health Technology Assessment Information Resources* [25].

This investigation has been conducted to accompany and inform methodological advances pursued via a UK Economic and Social Research Council (ESRC)–funded† project on approaches to synthesizing qualitative and quantitative research. This study aims to identify published examples of qualitative systematic reviews in health care published between 1988 and December 2004. It then seeks to characterize these reviews with regard to methods used for the sampling of studies for inclusion in each review and the search techniques used to identify such studies. In doing so, this study attempts to outline priorities for future development of the methods of qualitative systematic reviews, particularly with respect to standards for the identification and reporting of included studies.

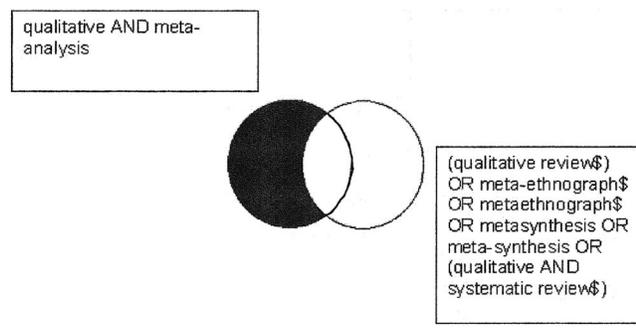
The nature of the study question together with the resource limitations of an unfunded project mean that it is not possible to conduct a full systematic review of identified qualitative systematic reviews. The methodology used for this study is a systematic survey of the literature. It employs systematic searching methods to identify qualitative systematic reviews. However, it makes no attempt to deliver judgments on the quality of retrieved studies or to validate independently decisions about the inclusion or exclusion of retrieved studies. It may thus be considered an “epidemiological survey” in attempting to quantify the absence or presence of key characteristics of the literature.

METHODS

As indicated in the description of a qualitative systematic review above, a major issue for this systematic survey of the literature is the variation that exists with regard to the terminology used to describe qualitative systematic reviews. This variation applies to “false-negatives”; that is, reviews that use qualitative methods and yet are not identifiable by such terms as “qualitative systematic review,” “meta-ethnography,”

† Principal investigator: Mary Dixon-Woods, project ID H333250043.

Figure 1
Verification strategy



or “meta-synthesis.” For example, this author was involved in one such study described simply as a “systematic review” [26]. However, it also applies to “false positives”; that is, to reviews that claim to be “qualitative systematic reviews” but simply use the term to differentiate from meta-analyses, that is, quantitative systematic reviews. For example, there are frequent instances of qualitative systematic reviews of randomized controlled trials. Such a situation is further compounded because few journals in which qualitative systematic reviews are published utilize structured abstracts. Such abstracts can help to clarify whether systematic searches have taken place and whether an established method of synthesis (such as Noblit and Hare’s meta-ethnography [9]) has been employed.

A comprehensive search was undertaken of the social science, health, and information science literature using PubMed, MEDLINE, CINAHL, Web of Knowledge (including the Science and Social Sciences Citation Index), and the Cochrane Methodology Register. A sensitive search strategy was used combining the keywords “(qualitative review\$) OR meta-ethnograph\$ OR metaethnograph\$ OR metasynthesis OR meta-synthesis OR (qualitative AND systematic review\$).” Although the combination of “qualitative AND meta-analysis” appeared to yield some relevant hits, it greatly increased the retrieval of manifestly irrelevant records. A verification strategy, produced by searching for this combination and then using the Boolean “NOT” with the sensitive search strategy, revealed no unique relevant records (Figure 1). As it appeared that indexers were adding the index term “meta-analysis” to recognize the presence in the title or abstract of the term “meta-synthesis,” the final strategy as given was considered adequate.

To be included, a study had to meet two criteria: the study, or at the very least a significant part of it, should have been a qualitative systematic review that reports search strategies and/or techniques, and it should have been conducted in a health care context. All decisions on inclusion were made by the author. In cases of doubt, reference was made to the full-text of the article in question. A list of potentially eligible and yet excluded studies was maintained to assist transparency. Citations to key qualitative methodological texts

were followed up, and Related Articles features on MEDLINE and Web of Knowledge were also utilized. Searches of the Internet using the Copernic Agent Professional meta-search agent <<http://www.copernic.com>> were used to track down unpublished and gray literature. This software is particularly useful for systematic literature reviews, because it searches multiple search engines (including AlltheWeb, Alta Vista, Hotbot, Lycos, and Yahoo), saves the results in an “audit trail” on the searcher’s computer, and allows manual weeding of results for inclusion or exclusion. Searches covered the period from 1988, when a key text on metasynthesis was published [9], to December 2004 and were restricted to English language, due to practical constraints. There were no other restrictions.

In excess of 400 articles passed an initial screening by title. Review of abstracts and text from those articles yielded 64 publications that met inclusion criteria. Published examples of meta-syntheses were obtained, and data regarding search methods were extracted into a matrix. A summary produced from this matrix is seen in Table 1. Key variables included authors, year of publication, the sampling strategy (including inclusion and exclusion criteria), and the search strategy (including databases, search terms used, and other searching approaches). The sampling strategy was defined as “comprehensive” if the search strategy attempted to retrieve all relevant studies in a topic area in a conventional systematic review manner, “purposeful” if the search strategy followed an underlying rationale in only trying to find a subset of predefined studies, and “opportunistic” if a review worked with a convenience subset of already retrieved studies. For limits, where languages for inclusion were reported, studies were categorized according to whether the reviews covered “English only,” “other (specified) languages,” or “all languages” (i.e., no language restrictions). For ease of presentation, all other categories of data extraction are simply coded in Table 1 as “Yes” for item reported or “No” for item not reported. However, full details of strategies were recorded in a matrix constructed as a tool for data extraction. Data on the topic area were also recorded, although only methodological data were reported in this survey.

RESULTS

Overall, sixty-five studies were identified; of these, forty-four (68%) reported at least one of three elements (databases, keywords, other approaches) of their search methods (Table 1) [10, 21, 26–67]. The remaining twenty-one studies did not report any elements of their search strategies (Table 2; find online) [7, 28, 68–88]. Four of these referred to another publication for details of their methods. Of the remaining seventeen, twelve studies did not attempt to conduct a systematic search of the literature, four simply represented an analysis of papers previously produced by the authors, and the remaining one analyzed studies from a previous report. A median of five databases was used in each review (range 1 to 23). The largest number of

Table 1
Included studies with level of literature search reporting (n = 44)

Authors (Year)	Sampling strategy	Study type	Approaches	Range of years	Limits	Inclusions and exclusions	Terms used	Electronic sources
Attree (2004) [27]	Comprehensive	No	Yes	Yes	English	No	No	No
Barroso et al. (2003) [28]	Purposive	No	Yes	Yes	English	Yes	Yes	Yes
Beck (2001) [29]	Comprehensive	No	No	Yes	English	No	Yes	Yes
Beck (2002) [30]	Comprehensive	Yes	Yes	Yes	English	No	Yes	Yes
Beck (2002) [31]	Comprehensive	No	Yes	Yes	English	No	No	Yes
Beverley et al. (2004) [26]	Comprehensive	No	Yes	Yes	English	No	Yes	Yes
Brauer et al. (2001) [32]	Comprehensive	No	No	Yes	English	No	Yes	Yes
Burke et al. (1998) [33]	Comprehensive	No	No	Yes	English	No	Yes	Yes
Campbell et al. (2003) [21]	Purposive	No	Yes	Yes	English	Yes	Yes	Yes
Carroll (2004) [34]	Comprehensive	No	No	Yes	English	No	Yes	Yes
Chapple and Rogers (1999) [35]	Comprehensive	Yes	Yes	Yes	English	No	Yes	Yes
Clemmens (2003) [36]	Purposive	No	No	Yes	English	Yes	Yes	Yes
Cook et al. (2001) [37]	Opportunistic	No	Yes	Yes	English	No	No	Yes
Duggan and Banwell (2004) [38]	Comprehensive	No	Yes	Yes	English	No	No	Yes
Evans and FitzGerald (2002) [39]	Comprehensive	No	Yes	Yes	English	No	Yes	Yes
Fingfeld (1999) [40]	Comprehensive	No	No	Yes	English	No	No	Yes
Fingfeld (2000) [41]	Comprehensive	No	No	Yes	English	No	Yes	Yes
Fredriksson (1999) [42]	Purposive	No	Yes	Yes	English/Scand*	No	Yes	Yes
Frederiksson (2001) [43]	Purposive	No	Yes	Yes	English/Scand	No	Yes	Yes
Garcia et al. (2002) [44]	Comprehensive	No	Yes	No	English	No	No	Yes
Jones (2004) [45]	Comprehensive	No	Yes	Yes	All	No	Yes	Yes
Kearney (2001) [46]	Purposive	Yes	Yes	Yes	English	No	No	Yes
Lefler and Bondy (2004) [47]	Comprehensive	No	Yes	Yes	All	Yes	Yes	Yes
Lemmer et al. (1999) [48]	Comprehensive	No	No	No	English	No	Yes	Yes
McEwan et al. (2004) [49]	Comprehensive	No	Yes	Yes	English	No	Yes	Yes
McKevitt et al. (2004) [50]	Comprehensive	No	Yes	Yes	English	No	Yes	Yes
McNaughton (2000) [51]	Comprehensive	No	Yes	Yes	English	No	Yes	Yes
Mold et al. (2003) [52]	Comprehensive	No	Yes	Yes	English	No	Yes	Yes
Murray et al. (2003) [53]	Comprehensive	No	Yes	Yes	English	No	Yes	Yes
Neill (2000) [54]	Comprehensive	No	Yes	Yes	English	No	Yes	Yes
Nelson (2002) [55]	Comprehensive	No	No	Yes	English	No	No	Yes
Nelson (2003) [56]	Comprehensive	Yes	No	No	English	Yes	Yes	Yes
Paterson (2001) [57]	Comprehensive	No	Yes	Yes	English	No	No	Yes
Paterson et al. (1998) [10]	Comprehensive	No	Yes	Yes	English	No	No	Yes
Roberts et al. (2002) [58]	Comprehensive	Yes	Yes	Yes	English	No	No	Yes
Rogers (1997) [59]	Comprehensive	Yes	Yes	Yes	English	Yes	Yes	Yes
Rowe and Rudkin (1999) [60]	Comprehensive	No	Yes	Yes	English	No	Yes	Yes
Sandelowski and Barroso (2003) [61]	Comprehensive	Yes	No	Yes	English	Yes	No	No
Sandelowski and Barroso (2003) [62]	Comprehensive	Yes	No	Yes	English	Yes	No	No
Sydes et al. (2004) [63]	Comprehensive	No	Yes	Yes	All	No	No	Yes
Thorne and Paterson (1998) [64]	Comprehensive	No	Yes	Yes	English	No	No	Yes
Thorne et al. (2002) [65]	Comprehensive	No	Yes	Yes	English	No	No	Yes
Walter et al. (2004) [66]	Comprehensive	Yes	Yes	No	All	Yes	Yes	Yes
Woodward and Webb (2001) [67]	Comprehensive	No	Yes	Yes	English	No	Yes	Yes

* Scand = Scandinavian languages.

Table 3
Elements of the STARLITE mnemonic

Element	Explanatory notes
S: Sampling strategy	<ul style="list-style-type: none"> ■ Comprehensive: attempts to identify all relevant studies on the topic ■ Selective: attempts to identify all relevant studies but only within specified limits ■ Purposive: samples from specific disciplines, years, journals
T: Type of studies	<ul style="list-style-type: none"> ■ Fully reported: describes actual study types (e.g., grounded theory) or designs to be included ■ Partially reported: uses an "umbrella" category such as "qualitative studies" without defining what this means
A: Approaches	<ul style="list-style-type: none"> ■ Approaches other than electronic subject searches (see below) ■ Example: hand-searching ■ Citation snowballing
R: Range of years (start date–end date)	<ul style="list-style-type: none"> ■ Fully reported: includes start and end dates with justification for time period chosen ■ Partially reported: includes start and end dates but only determined available coverage of databases
L: Limits	<ul style="list-style-type: none"> ■ Functional limits that are applied for logistic reasons but do not alter the topic conceptually (e.g., human, English etc.)
I: Inclusion and exclusions	<ul style="list-style-type: none"> ■ Conceptual limitations that mediate the scope of the topic area (e.g., geographical location, setting, or a specific focus of study)
T: Terms used	<ul style="list-style-type: none"> ■ Fully present: example of a sample search strategy from one or more of the main databases ■ Partially present: reports terminology used but without evidence of search syntax and operators
E: Electronic sources	<ul style="list-style-type: none"> ■ Reports databases used and, optimally, search platforms and vendors to assist in replication

databases was searched in studies that exclusively involved information professionals in the review process [26, 38].

Keywords (search terms used) were only reported in twenty-five studies. While no formal analysis of the quality of search strategies was undertaken, certain characteristics could be observed from the literature. There was little evidence for the use of techniques to maximize retrieval such as truncation or explosion of subject terms. Where search terms were reported, it was not usually clear whether they were free-text terms or approved subject headings. Studies did not typically present a sample search strategy, not even as an appendix, and thus it was difficult to observe whether Boolean operators had been employed correctly. In addition, it was unclear whether methodological terms had been used in addition to subject-specific terms to privilege qualitative studies (e.g., the term "qualitative"). Only nine of the studies reported keywords specifically to retrieve qualitative studies. No formal data were extracted on whether a librarian or information specialist was involved in the search process. However, very few studies acknowledged such a contribution in either the authorship or the acknowledgements, and, furthermore, most studies failed to report any such involvement in their methods sections.

The database most frequently mentioned was CINAHL (31 times). MEDLINE was mentioned thirty times, the PsycINFO/PsycLIT/Psychological Abstracts combination was mentioned twenty-five times, and Sociological Abstracts/SOCIOFILE (9 times) and ERIC (5 times) were also listed.

The most common supplementary strategies used alongside searching bibliographic databases were following up reference lists (17 times) and hand-searching (13 times). The most comprehensive report of the literature searching process itemized 23 databases, 10 Websites, and 6 other techniques and reported keywords [26].

Although this study focused on the methodological content of included studies, not their topical content, it was interesting to observe that the most common topics related to chronic disease and to women's health. This observation, which requires further empirical exploration, attests to the possibility that qualitative systematic reviews are being utilized as a facilitative method to provide a "collective voice" to disenfranchised groups [89].

In performing the data extraction, a necessary prelude to reporting the presence or absence of certain characteristics of literature-searching approaches in qualitative systematic reviews, the author has identified several features that might usefully form the basis for future reporting standards for literature searches for systematic reviews. These are briefly outlined below.

PROPOSED STANDARDS FOR REPORTING LITERATURE SEARCHES

The systematic review movement has already driven the development of standards to improve the quality

of reporting of quantitative systematic reviews (e.g., QUOROM [90] and MOOSE [91]). Such standards make it easier for readers to assess the quality of such reviews and for researchers to replicate their methods [92]. To date, no standards have been published for reporting of literature searches, so critical to the successful conduct of systematic reviews.

Clearly, standards need to cover all stages of the systematic review process. Nevertheless, the case is particularly strong for focusing on the quality of reporting methods for identification of included studies, at least in the first instance. Reasons for this include the poor quality of reporting as observed by this survey, the impact of sampling decisions on the findings of qualitative reviews, and the fact that, once a question has been identified, decisions made at this stage determine the remainder of the review process. Table 3 encapsulates a proposed framework for reporting the quality of literature searches based on the empirical findings from this review and supported by the author's extensive experience conducting other forms of synthesis such as HTAs, guidelines, and quantitative systematic reviews. The elements to be included when reporting literature searching to allow a reader to assess the quality of a search and to replicate it, if necessary, are conveyed using the mnemonic STARLITE.

STARLITE constitutes not simply a memorable mnemonic but also serves as an acronym for **Standards for Reporting Literature searches**. Many of the above elements are already widely acknowledged as important in the recording of literature searches, although no formal standards exist. A notable addition, however, is the inclusion of "sampling strategy." This addition is stimulated by the specific needs of qualitative systematic reviews, where an assumption of comprehensiveness cannot be made. It is possible for a qualitative systematic review to be explicit and systematic, while not aspiring to comprehensiveness, if it employs purposive sampling of the literature from certain disciplines or even from particular years. Indeed closer examination of many quantitative systematic reviews reveals that they create an illusion of "comprehensiveness," when the reality is that the studies that they actually include are shaped by arbitrary decisions about search strategies dictated themselves by time and resource limitations.

The author intends, subject to agreement with colleagues in the international HTA community, this approach to form a framework for accepted standards for reporting of literature searches for HTAs and systematic reviews in general. An outline example of reporting for a qualitative systematic review using the STARLITE framework is provided (Table 4; find online). Within this framework, future work could concentrate on specifying how exactly the contents of each element should be reported and subsequently evaluated. The magnitude of the task ahead is emphasized by returning to the survey dataset and summarizing the presence or absence of the STARLITE elements (Table 5).

Table 5

Completeness of reporting (n = 44)

	Fully or partially present (percentage)	Absent (percentage)
Sampling strategy	44 (100)	0 (—)
Type of study	9 (20)	35 (80)
Approaches	32 (73)	12 (27)
Range of years	40 (91)	4 (9)
Limits (e.g., English)	44 (100)	0 (—)
Inclusion and exclusions	9 (20)	35 (80)
Terms used	28 (64)	16 (36)
Electronic sources	41 (93)	3 (7)

DISCUSSION

This literature survey has sought to identify the presence and absence of prespecified characteristics in a body of literature believed to meet an operational definition of a "qualitative systematic review" in health care. It is recognized that use of a single reviewer for judgments on inclusion and exclusion of studies opens the possibility of bias. This limitation would indeed be serious if the reviewer had subsequently attempted to make value judgments on whether or not the literature searching methods are "adequate" or not. Such an approach would require the addition of several quality procedures such as the use of additional reviewers, a quality checklist, and assessment of inter-rater reliability. By retaining a descriptive, rather than evaluative, focus the author has been able to characterize a population of qualitative systematic review studies. This population does, of course, have the further potential to be extended further through more exhaustive search procedures such as hand-searching of key qualitative journals such as *Qualitative Research and Qualitative Health Research*.

Further work is required on assessing the quality of the reported search methods and evaluating their likely impact on the quality of the subsequent reviews. In this context, it is interesting to observe commencement of the *Evaluating Health Technology Assessment Searches* (EHTAS) research study to develop a quality assessment checklist for searches used in HTAs and systematic reviews. Finally, this survey has been independently examined in a wider study investigating the quality of reporting of the methods of all stages of the qualitative systematic review, not just the searching, and there are plans to use this data set in further methodological research.

The field of qualitative systematic review is still relatively immature, with no consensus yet on what constitutes such a review. This is illustrated by examples identified from the tables above; does searching only one database, synthesizing a small number of studies by a select group of authors, or identifying studies systematically but stopping short of synthesis rightly constitute a qualitative systematic review? Of course, each criterion exists on a continuum, rendering judgments on what should be included or excluded in this genre necessarily subjective. Ironically, this means that this survey, while possessing a measure of systematicity, falls short of the requirement to be easily reproducible.

CONCLUSION

Recent years have seen ongoing improvement in methods of conducting and reporting systematic reviews. While these two issues remain discrete stages of the review process, they are interconnected; one cannot automatically conclude that a poorly reported review has been badly conducted, but such poor reporting does mean that many of the intrinsic virtues of a systematic review are negated. For example, systematic reviews draw strength from the fact that they claim to be both explicit and reproducible. In 1987, Mulrow [93] highlighted the poor state of the medical review article. Over a decade later, in 1999, McAlister and colleagues [94] found that less than a quarter of published reviews described how evidence was identified, evaluated, or integrated.

Librarians have a key role in the further development of systematic review methods, particularly as they relate to retrieval of the evidence. This is true for both the conduct of the review itself and its subsequent reporting. Findings from this survey have the potential to inform the future work of groups of international information specialists, such as the Cochrane Collaboration Information Retrieval Methods Group [95], in developing standards for reporting literature searches to the benefit of both quantitative and qualitative systematic reviews. In the meantime, these findings are offered with the exhortation that authors and editors improve the quality of methods for identifying studies for inclusion in systematic reviews. It is hoped that this article, and its underpinning research, will stimulate improvements in conducting and reporting systematic reviews, both qualitative and quantitative.

ACKNOWLEDGMENTS

The author thanks his collaborators on Economic and Social Research Council Research Methods Programme project number: H333250043 for providing the stimulus for this spin-off project, especially Mary Dixon-Woods who put the team together.

REFERENCES

1. RITCHIE JE. Using qualitative research to enhance the evidence-based practice of health care providers. *Aust J Physiother* 1999;45(4):251-6.
2. EVANS D. Database searches for qualitative research. *J Med Libr Assoc* 2002 Jul;90(3):290-3.
3. MADJAR I, TAYLOR B, LAWLER J. The role of qualitative research in evidence based practice. *Collegian* 2002 Oct;9(4):7-9.
4. MURPHY E, DINGWALL R, GREATBATCH D, PARKER S, WATSON P. Qualitative research methods in health technology assessment: a review of the literature. *Health Technol Assess* 1998;2(16):iii-ix,1-274.
5. TRANFIELD D, DENYER D, SMART P. Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *Brit J Management* 2003;14(3):207-22.
6. SANDELOWSKI M, DOCHERTY S, EMDEN C. Focus on qual-

- itative methods. qualitative metasynthesis: issues and techniques. *Res Nurs Health* 1997 Aug;20(4):365-71.
7. BECK CT. Seeing the forest for the trees: a qualitative synthesis exercise. *J Nurs Educ* 2003 Jul;42(7):318-23.
 8. JENSEN LA, ALLEN MN. Meta-synthesis of qualitative findings. *Qual Health Res* 1999;6(4):553-60.
 9. NOBLIT GW, HARE RD. *Meta-ethnography: synthesizing qualitative studies*. Newbury Park, CA: Sage, 1988.
 10. PATERSON BL, THORNE S, DEWIS M. Adapting to and managing diabetes. *Image J Nurs Sch* 1998;30(1):57-62.
 11. HIGGINS JPT, GREEN S, eds. *Cochrane handbook for systematic reviews of interventions 4.2.5*. [Web document]. Cochrane Collaboration. [cited 15 Sep 2005]. <<http://www.cochrane.org/resources/handbook/hbook.htm>>.
 12. NATIONAL HEALTH SERVICE CENTRE FOR REVIEWS AND DISSEMINATION. *Undertaking systematic reviews of research on effectiveness. CRD's guidance for those carrying out or commissioning reviews. CRD report number 4. 2nd ed.* [Web document]. York, UK: University of York, 2001. [cited 4 Jan 2006]. <<http://www.york.ac.uk/inst/crd/report4.htm>>.
 13. DIXON-WOODS M, FITZPATRICK R. Qualitative research in systematic reviews has established a place for itself. *BMJ* 2001 Oct 6;323(7316):765-6.
 14. BARBOUR RS. Checklists for improving rigour in qualitative research: a case of the tail wagging the dog? *BMJ* 2001 May 5;322(7294):1115-7.
 15. EAKIN JM, MYKHALOVSKIY E. Reframing the evaluation of qualitative health research: reflections on a review of appraisal guidelines in the health sciences *J Eval Clin Pract*. 2003 May;9(2):187-94.
 16. DIXON-WOODS M, SHAW RL, AGARWAL S, SMITH JA. The problem of appraising qualitative research. *Qual Saf Health Care* 2004 Jun;13(3):223-5.
 17. CESARIO S, MORIN K, SANTA-DONATO A. Evaluating the level of evidence of qualitative research. *J Obstet Gynecol Neonatal Nurs* 2002 Nov-Dec;31(6):708-14.
 18. BOOTH A. Cochrane or cock-eyed? how should we conduct systematic reviews of qualitative research? [Web document]. Presented at: Qualitative Evidence Based Practice Conference; University of Coventry; 14-16 May 2001. [cited 4 Jan 2006]. <<http://www.leeds.ac.uk/educol/documents/00001724.htm>>.
 19. WEED M. "Meta interpretation": a method for the interpretive synthesis of qualitative research. *Forum: Qualitative Soc Res* [serial online]. 2005 Jan;6(1),art. 37. [cited 4 Jan 2006]. <<http://www.qualitative-research.net/fqs-texte/1-05/05-1-37-e.htm>>.
 20. PAWSON R, GREENHALGH T, HARVEY G, WALSH K. Realist review—a new method of systematic review designed for complex policy interventions. *J Health Serv Res Policy* 2005 Jul;10(suppl 1):21-34.
 21. CAMPBELL R, POUND P, POPE C, BRITTEN N, PILL R, MORGAN M, DONOVAN J. Evaluating meta-ethnography: a synthesis of qualitative research on lay experiences of diabetes and diabetes care. *Soc Sci Med*. 2003 Feb;56(4):671-84.
 22. SHAW RL, BOOTH A, SUTTON AJ, MILLER T, SMITH JA, YOUNG B, JONES DR, DIXON-WOODS M. Finding qualitative research: an evaluation of search strategies. *BMC Med Res Methodol* 2004 Mar 16;4:5.
 23. SHAW RL, BOOTH A, SUTTON AJ, MILLER T, SMITH JA, YOUNG B, JONES DR, DIXON-WOODS M. Electronic literature search for systematic review of qualitative evidence. *J Epid & Community Health* 2003;57(suppl 1):A15.
 24. GRANT MJ. How does your searching grow? a survey of search preferences and the use of optimal search strategies in the identification of qualitative research. *Health Info Libr J* 2004 Mar;21(1):21-32.
 25. TOPFER LA, AUSTON I, eds. *E-text on health technology assessment (HTA) information resources*. [Web document]. Bethesda, MD: National Library of Medicine. [updated Nov 2005; cited 4 Jan 2006]. <<http://www.nlm.nih.gov/nichsr/ehta/>>.
 26. BEVERLEY CA, BATH PA, BOOTH A. Health information needs of visually impaired people: a systematic review of the literature. *Health Soc Care Community* 2004 Jan;12(1):1-24.
 27. ATTREE P. Growing up in disadvantage: a systematic review of the qualitative evidence. *Child Care Health Dev* 2004 Nov;30(6):679-89.
 28. BARROSO J, GOLLOP CJ, SANDELOWSKI M, MEYNELL J, PEARCE PF, COLLINS LJ. The challenges of searching for and retrieving qualitative studies. *West J Nurs Res* 2003 Mar;25(2):153-78.
 29. BECK CT. Caring within nursing education: a metasynthesis. *Nurs Educ* 2001 Mar;40(3):101-9.
 30. BECK CT. Postpartum depression: a metasynthesis. *Qual Health Res* 2002 Apr;12(4):453-72.
 31. BECK CT. Mothering multiples: a meta-synthesis of qualitative research. *MCN Am J Matern Child Nurs* 2002 Jul-Aug;27(4):214-21.
 32. BRAUER DJ, SCHMIDT BJ, PEARSON V. A framework for care during the stroke experience. *Rehabil Nurs* 2001 May-Jun;26(3):88-93.
 33. BURKE SO, KAUFFMANN E, COSTELLO E, WISKIN N, HARRISON MB. Stressors in families with a child with a chronic condition: an analysis of qualitative studies and a framework. *Can J Nurs Res* 1998 Spring;30(1):71-95.
 34. CARROLL SM. Nonvocal ventilated patients' perceptions of being understood. *West J Nurs Res* 2004 Feb;26(1):85-103.
 35. CHAPPLE A, ROGERS A. "Self-care" and its relevance to developing demand management strategies: a review of qualitative research. *Health Soc Care Community* 1999 Nov;7(6):445-54.
 36. CLEMMENS D. Adolescent motherhood: a meta-synthesis of qualitative studies. *MCN Am J Matern Child Nurs* 2003 Mar-Apr;28(2):93-9.
 37. COOK DJ, MEADE MO, PERRY AG. Qualitative studies on the patient's experience of weaning from mechanical ventilation. *Chest* 2001 Dec;120(6 suppl):469S-73S.
 38. DUGGAN F, BANWELL L. Constructing a model of effective information dissemination in a crisis. *Inf Res: An Int Electronic J* [serial online]. 2004 Apr;9(3):art. 178. [cited 4 Jan 2006]. <<http://informationr.net/ir/9-3/paper178.html>>.
 39. EVANS D, FITZGERALD M. The experience of physical restraint: a systematic review of qualitative research. *Contemp Nurse* 2002 Oct;13(2-3):126-35.
 40. FINFGELD DL. Courage as a process of pushing beyond the struggle. *Qual Health Res* 1999 Nov;9(6):803-14.
 41. FINFGELD DL. Self-resolution of drug and alcohol problems: a synthesis of qualitative findings. *J Addictions Nurs* 2000;12:65-72.
 42. FREDRIKSSON L. Modes of relating in a caring conversation: a research synthesis on presence, touch and listening. *J Adv Nurs* 1999 Nov;30(5):1167-76.
 43. FREDRIKSSON L, ERIKSSON K. The patient's narrative of suffering: a path to health? *Scand J Nurs Sci* 2001;1(1):s3-11.
 44. GARCIA J, BRICKER L, HENDERSON J, MARTIN MA, MUGFORD M, NIELSON J, ROBERTS T. Women's views of pregnancy ultrasound: a systematic review. *Birth* 2002 Dec;29(4):225-50.
 45. JONES ML. Application of systematic review methods to qualitative research: practical issues. *J Adv Nurs* 2004 Nov;48(3):271-8.
 46. KEARNEY MH. Enduring love: a grounded formal theory

of women's experience of domestic violence. *Res Nurs Health* 2001 Aug;24(4):270-82.

47. LEFLER LL, BONDY KN. Women's delay in seeking treatment with myocardial infarction: a meta-synthesis. *J Cardiovasc Nurs* 2004 Jul-Aug;19(4):251-68.

48. LEMMER B, GRELLIER R, STEVEN J. Systematic review of non-random and qualitative research literature: exploring and uncovering an evidence base for health visiting and decision making. *Qual Health Res* 1999;9:315-28.

49. MCEWAN MJ, ESPIE CA, METCALFE J. A systematic review of the contribution of qualitative research to the study of quality of life in children and adolescents with epilepsy. *Seizure* 2004 Jan;13(1):3-14.

50. MCKEVITT C, REDFERN J, MOLD F, WOLFE C. Qualitative studies of stroke: a systematic review. *Stroke* 2004 Jun;35(6):1499-505.

51. MCNAUGHTON DB. A synthesis of qualitative home visiting research. *Public Health Nurs* 2000 Nov-Dec;17(6):405-14.

52. MOLD F, MCKEVITT C, WOLFE C. A review and commentary of the social factors which influence stroke care: issues of inequality in qualitative literature. *Health Soc Care Community* 2003 Sep;11(5):405-14.

53. MURRAY J, ASHWORTH R, FORSTER A, YOUNG J. Developing a primary care-based stroke service: a review of the qualitative literature. *Br J Gen Pract* 2003 Feb;53(487):137-42.

54. NEILL S. Acute childhood illness at home: the parents' perspective. *J Adv Nurs* 2000 Apr;31(4):821-32.

55. NELSON AM. A metasynthesis: mothering other-than-normal children. *Qual Health Res* 2002 Apr;12(4):515-30.

56. NELSON AM. Transition to motherhood. *J Obstet Gynecol Neonatal Nurs* 2003 Jul-Aug;32(4):465-77.

57. PATERSON BL. The shifting perspectives model of chronic illness. *J Nurs Scholarsh* 2001;33(1):21-6.

58. ROBERTS KA, DIXON-WOODS M, FITZPATRICK R, ABRAMS KR, JONES DR. Factors affecting uptake of childhood immunisation: a Bayesian synthesis of qualitative and quantitative evidence. *Lancet* 2002 Nov 16;360(9345):1596-9.

59. ROGERS WA. A systematic review of empirical research into ethics in general practice. *Br J Gen Pract* 1997 Nov;47(424):733-7.

60. ROWE D, RUDKIN A. A systematic review of the qualitative evidence for the use of lifestyle planning in people with learning disabilities. *J Learning Disabil Nurs Health Soc Care* 1999;3(3):148-58.

61. SANDELOWSKI M, BARROSO J. Toward a metasynthesis of qualitative findings on motherhood in HIV-positive women. *Res Nurs Health* 2003 Apr;26(2):153-70.

62. SANDELOWSKI M, BARROSO J. Motherhood in the context of maternal HIV infection. *Res Nurs Health* 2003 Dec;26(6):470-82.

63. SYDES MR, SPIEGELHALTER DJ, ALTMAN DG, BABIKER AB, PARMAR MKB, DAMOCLES Group. Systematic qualitative review of the literature on data monitoring committees for randomized controlled trials. *Clinical Trials* 2004 Feb;1(1):60-79.

64. THORNE S, PATERSON B. Shifting images of chronic illness. *Image J Nurs Sch* 1998;30(2):173-8.

65. THORNE S, PATERSON B, ACORN S, CANAM C, JOACHIM G, JILLINGS C. Chronic illness experience: insights from a metastudy. *Qual Health Res* 2002 Apr;12(4):437-52.

66. WALTER FM, EMERY J, BRAITHWAITE D, MARTEAU TM. Lay understanding of familial risk of common chronic diseases: a systematic review and synthesis of qualitative research. *Ann Fam Med* 2004 Nov-Dec;2(6):583-94.

67. WOODWARD V, WEBB C. Women's anxieties surrounding

breast disorders: a systematic review of the literature. *J Adv Nurs* 2001 Jan;33(1):29-41.

68. ARMAN M, REHNSFELDT A. The hidden suffering among breast cancer patients: a qualitative metasynthesis. *Qual Health Res* 2003 Apr;13(4):510-27.

69. BARROSO J, POWELL-COPE GM. Metasynthesis of qualitative research on living with HIV infection. *Qual Health Res* 2000 May;10(3):340-53.

70. BARROSO J, SANDELOWSKI M. Substance abuse in HIV-positive women. *J Assoc Nurses AIDS Care* 2004 Sep-Oct;15(5):48-59.

71. BECK CT. Mothering multiples: a meta-synthesis of qualitative research. *MCN Am J Matern Child Nurs* 2002 Jul-Aug;27(4):214-21.

72. BLEICH MR, HEWLETT PO, SANTOS SR, RICE RB, COX KS, RICHMEIER S. Analysis of the nursing workforce crisis: a call to action. *Am J Nurs* 2003 Apr;103(4):66-74.

73. BRITTEN N, CAMPBELL R, POPE C, DONOVAN J, MORGAN M, PILL R. Using meta ethnography to synthesise qualitative research: a worked example. *J Health Serv Res Policy* 2002 Oct;7(4):209-15.

74. CLARK AM, CURZIO J, LINDSAY GM, FLEMING VEM, MCINTOSH J. Exploring patients' perspectives of coronary heart disease: discerning methods and a review of the qualitative literature. *Coronary Health Care* 1998;2(3):118-28.

75. HARDEN A, GARCIA J, OLIVER S, REES R, SHEPHERD J, BRUNTON G, OAKLEY A. Applying systematic review methods to studies of people's views: an example from public health research. *J Epidemiol Community Health* 2004 Sep;58(9):794-800.

76. JENSEN LA, ALLEN MN. A synthesis of qualitative research on wellness-illness. *Qual Health Res* 1994;4:349-69.

77. KEARNEY MH. Truthful self-nurturing: a grounded formal theory of women's addiction recovery. *Qual Health Res* 1998 Jul;8(4):495-512.

78. KENNEDY HP, ROUSSEAU AL, LOW LK. An exploratory metasynthesis of midwifery practice in the United States. *Midwifery* 2003 Sep;19(3):203-14.

79. MCCORMICK J, RODNEY P, VARCOE C. Reinterpretations across studies: an approach to meta-analysis. *Qual Health Res* 2003 Sep;13(7):957-73.

80. MEADOWS-OLIVER M. Mothering in public: a meta-synthesis of homeless women with children living in shelters. *J Spec Pediatr Nurs* 2003 Oct-Dec;8(4):130-6.

81. MORSE JM. Responding to threats to integrity of self. *ANS Adv Nurs Sci* 1997 Jun;19(4):21-36.

82. RUSSELL CK, BUNTING SM, GREGORY DM. Protective care-receiving: the active role of care-recipients. *J Adv Nurs* 1997 Mar;25(3):532-40.

83. SANDELOWSKI M, BARROSO J. Finding the findings in qualitative studies. *J Nurs Scholarsh* 2002;34(3):213-9.

84. SANDELOWSKI M, BARROSO J. Creating metasummaries of qualitative findings. *Nurs Res* 2003 Jul-Aug;52(4):226-33.

85. SANDELOWSKI M, LAMBE C, BARROSO J. Stigma in HIV-positive women. *J Nurs Scholarsh* 2004;36(2):122-8.

86. SHERWOOD G. Meta-synthesis of qualitative analyses of caring: defining a therapeutic model of nursing. *Adv Pract Nurs Q* 1997 Summer;3(1):32-42.

87. STAVRI PZ. Personal health information-seeking: a qualitative review of the literature. *Stud Health Technol Informatic* 2001;84(2):1484-8.

88. VARCOE C, RODNEY P, MCCORMICK J. Health care relationships in context: an analysis of three ethnographies. *Qual Health Res* 2003 Sep;13(7):957-73.

89. WARR DJ. Stories in the flesh and voices in the head: reflections on the context and impact of research with dis-

- advantaged populations. *Qual Health Res* 2004 Apr;14(4): 578–87.
90. MOHER D, COOK DJ, EASTWOOD S, OLKIN I, RENNIE D, STROUP DF. Improving the quality of reports of meta-analyses of randomised controlled trials: the QUOROM statement. quality of reporting of meta-analyses. *Lancet* 1999 Nov 27; 354(9193):1896–900.
91. STROUP DF, BERLIN JA, MORTON SC, OLKIN I, WILLIAMSON GD, RENNIE D, MOHER D, BECKER BJ, SIPE TA, THACKER SB. Meta-analysis of observational studies in epidemiology: a proposal for reporting. Meta-analysis Of Observational Studies in Epidemiology (MOOSE) Group. *JAMA* 2000 Apr 19;283(15):2008–12.
92. GOLDER S, MATHER L, WRIGHT K, GLANVILLE J. What's on the Web: recommendations for reporting research. *J Health Serv Res Policy* 2005;10(2):124–5.
93. MULROW CD. The medical review article: state of the science. *Ann Intern Med* 1987 Mar;106(3):485–8.
94. MCALISTER FA, CLARK HD, VAN WALRAVEN C, STRAUS SE, LAWSON FM, MOHER D, MULROW CD. The medical review article revisited: has the science improved? *Ann Intern Med* 1999 Dec 21;131(12):947–51.
95. PRITCHARD SJ, WEIGHTMAN AL. Towards a Cochrane Information Retrieval Methods Group: a progress report. *Health Info Libr J* 2003 Jun;(20 suppl 1):69–71.

Received September 2005; accepted April 2006

Table 2
Other qualitative systematic reviews excluded for not reporting search methods

Study	Reason for exclusion*
Arman (2003) [68]	No details
Barroso and Powell-Cope (2000) [69]	No details, mentions "Extensive computer searches"
Barroso and Sandelowski (2004) [70]	No details (reported in [27])
Beck (2003) [30]	No details (reported in [71])
Bleich et al. (2003) [72]	No details
Britten et al. (2002) [73]	No details, studies arbitrarily chosen from previous review
Clark et al. (1998) [74]	No details
Harden et al. (2003) [75]	No details
Jensen and Allen (1994) [76]	No details
Kearney (1998) [77]	No details
Kennedy et al. (2003) [78]	Only included studies conducted by authors
McCormick et al. (2003) [79]	Only included studies conducted by authors
Meadows-Oliver (2003) [80]	No details
Morse (1997) [81]	No details
Russell et al. (1997) [82]	Only included studies conducted by authors
Sandelowski and Barroso (2002) [83]	No details
Sandelowski and Barroso (2003) [84]	No details (reported in [27])
Sandelowski et al. (2004) [85]	No details (reported in [27])
Sherwood (1997) [86]	No details
Stavri (2001) [87]	No details
Varcoe et al. (2003) [88]	Only included studies conducted by the authors

* "No details" signifies no details of *either* databases or keywords or other methods.

Table 4
Outline example of a report of a literature search structured according to STARLITE principles

Title: Qualitative systematic review of support for breastfeeding [Publication pending]	
S: Sampling strategy	Purposive: Samples two databases from medicine, nursing, and social science fields
T: Type of study	Any kind of qualitative study (includes ethnographic, grounded theory, focus groups, etc.)
A: Approaches	Subject searching, citation searching, hand-searching, Internet searching, contact with experts
R: Range of years (start date: end date)	No restrictions: to the beginning of each candidate database—to the end of 2003
L: Limits	English, human
I: Inclusion and exclusions	Inclusion: qualitative method, about support for breast-feeding women; exclusion: quantitative method, animal lactation, physiology of breast milk (i.e., not related to aspects of support)
T: Terms used	Complete search strategies available as additional files via Website
E: Electronic sources	MEDLINE [Ovid], EMBASE [Ovid], CINAHL [Ovid], British Nursing Index [SilverPlatter], Applied Social Sciences Index and Abstracts (ASSIA) [Cambridge Scientific Abstract], Social Sciences Citation Index [Web of Knowledge], other databases (e.g., MIDIRS, NeLH)