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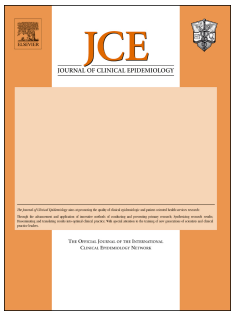

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Structured methodology review identified seven (RETREAT) criteria for selecting qualitative evidence synthesis approaches

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Abstract

Objective: To compare and contrast different methods of qualitative evidence synthesis (QES) against criteria identified from the literature and to map their attributes to inform selection of the most appropriate QES method to answer research questions addressed by qualitative research.

Study design and setting: Electronic databases, citation searching and a study register were used to identify studies reporting QES methods. Attributes compiled from 26 methodological papers (2001-2014) were used as a framework for data extraction. Data were extracted into summary tables by one reviewer and then considered within the author team.

Results: We identified seven considerations determining choice of methods from the methodological literature, encapsulated within the mnemonic RETREAT (Review question – Epistemology – Time/Timescale – Resources – Expertise – Audience and purpose – Type of Data). We mapped 15 different published QES methods against these seven criteria. The final framework focuses on stand-alone QES methods but may also hold potential when integrating quantitative and qualitative data.

Conclusion: These findings offer a contemporary perspective as a conceptual basis for future empirical investigation of the advantages and disadvantages of different methods of QES. It is hoped that this will inform appropriate selection of QES approaches.

Keywords: Systematic review; qualitative evidence synthesis; qualitative research; review methods

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What is new?

Key findings

We identified attributes from 26 methodological papers to compile the seven domain RETREAT framework and to use this to explore 15 published qualitative evidence synthesis (QES) methods. These findings represent a contemporary perspective on different methods of QES on which to base further conceptual development and empirical investigation.

What this adds to what was known?

This study represents the first known example of a criterion-based approach to inform selection of QES methods. We believe that this study addresses a deficit in understanding which selection criteria are important, among many of those involved in qualitative synthesis, that often leads to a mismatch between the aims of a QES and the optimal methods by which to address these aims. We organised the 15 QES methods according to seven RETREAT criteria (Review question – Epistemology – Time/Timescale – Resources – Expertise – Audience and purpose – Type of Data) to facilitate selection of, and comparison between, different methods.

What is the implication and what should change now?

This study offers a conceptual basis for exploring the purpose and conduct of emerging QES methods. We intend the information we have compiled, and the resultant guidance, to act as a catalyst for empirical research and as a basis for further debate on selection of appropriate QES methods. Potentially the RETREAT framework offers an approach to documenting the characteristics of other knowledge synthesis approaches, beyond those that involve synthesis of qualitative research.

1. Introduction

We aimed to develop a framework of criteria to help reviewers, and those commissioning reviews, to choose an appropriate method for conducting a qualitative evidence synthesis (QES). Our objectives were to systematically identify factors documented by review methodologists as influencing choice of synthesis method; to evaluate existing published QES methods against the resultant criteria; and to compare and contrast different QES methods by which to answer research questions using findings from qualitative studies. This work was conducted as part of the EU-funded INTEGRATE-HTA project and an extensive report of this work component is available from the project website[1]. INTEGRATE-HTA was an innovative, three-year European Union-funded project that aimed to develop concepts and methods that enable a patient-centred, comprehensive assessment of complex health technologies. Qualitative evidence syntheses are key to patient-centred approaches to health technology assessment[2] and the project team, together with co-convenors of the Cochrane Qualitative and Implementation Methods Group (CQIMG), identified choice of QES methods as a priority for development.

The stimulus for this work derives from increasing recognition of the complexity of review questions[3-5] and the consequent demands for sophisticated and flexible review methods[6]. Within this wider review agenda qualitative evidence synthesis (QES), the preferred label of the Cochrane Qualitative and Implementation Methods Group[7], for synthesis of qualitative research, has been subject to probably the most rapid development and change. Frequently, promotion of specific approaches is largely based on single case studies and runs in advance of empirical testing of their comparative utility. Indeed, studies directly comparing two or more methods for synthesis of the same data (e.g. the comparison of textual narrative and thematic synthesis) are rare[8]. As a consequence, the field lacks guidance on how to identify the most appropriate candidate method for a particular research question or purpose. Several authors attempt to navigate the available choices[9-12]. Other authors depict available choices within an algorithm or decision chart[13]. However, the most recent attempt to summarise methodological choices was published in 2012[14]. The proliferation of existing methods, and the regular appearance of what claim to be new methods, in the intervening five years makes previous attempts at comprehensive coverage inevitably incomplete.

Limited guidance exists on how to select QES methods. In 2008, the Cochrane Qualitative and Implementation Methods Group produced an algorithm to assist selection [13]. At this time, there was little empirical evidence on the advantages of different methods and the Group's remit was limited to using qualitative evidence within the context of Cochrane systematic reviews of effects. Methodology

texts speculate on the usefulness of different QES methods but often reflect the perspective of individual review-producing organisations (e.g. the EPPI-Centre [14] and the Joanna Briggs Institute [15]).

2. Methods: Compilation of RETREAT framework

This methodological overview focuses on qualitative synthesis methods that are predominantly qualitative (e.g. Thematic synthesis, Meta-Ethnography, Meta-Interpretation, Meta-Study). We acknowledge the important role of qualitative synthesis methods within mixed methods approaches with a qualitative orientation ("qualitising" approaches to transforming findings[16]) (Critical Interpretive Synthesis[17], Meta-Narrative[18]), methods for "quantitising" approaches[16] (conversion of qualitative data into quantitative form) to transforming findings (Bayesian Meta-analysis/Synthesis, Case Survey, Content Analysis, Cross Case Analysis and Qualitative Comparative Analysis)[16,19] and mixed methods approaches that handle quantitative and qualitative data equally (Meta-Summary, Realist Synthesis, Rapid Realist Synthesis). However these methods are excluded from this paper, although present within the broader scope of the wider INTEGRATE-HTA guidance[1] The CQIMG Methodology Register, initiated in January 2016, including references to 9977 publications since 1982 and maintained by the lead author, was searched for references relating to method choice or articles reviewing multiple QES methods, using search terms relating to "qualitative"; choice or selection (i.e. choice, choose, choosing, select, selection, selecting); and synthesis type or method (i.e. method, methods, synthesis, synthesis method(s), type of synthesis, synthesis type). This register is populated monthly from keyword searches of PubMed and Web of Science and from Citation Alerts from Google Scholar for 12 key methodological articles.

For synthesis and analysis we used a variant of the best fit framework synthesis approach[20]. This involves identification of a "good enough" contingent preliminary framework as a starting point for deductive data analysis. Data not accommodated within the preliminary framework is temporarily "parked" for a subsequent inductive phase where new concepts are developed thematically. Data is then coded against the revised framework. This particular variant of the approach was developed for this methodological work; initial data was only mapped at the domain level (Table 1) and it was only after the domains had been identified that we conducted our detailed examination of data within each domain.

A three-stage process was therefore undertaken to develop and test the proposed framework:

1. Mapping and analysis of domains from key methodological texts against a preliminary framework

2. Expansion of preliminary framework to accommodate additional data within a new (RETREAT) framework

3. Review of wider methodological literature against the RETREAT framework

Mapping against preliminary framework

An initial framework (Time, Resources, Expertise, Audience, Data: TREAD), developed for teaching on annual international qualitative synthesis (ESQUIRE) courses, was the starting point. This initial framework claimed to be experience based, rather than evidence based, and had been devised as a heuristic mnemonic to help course participants to consider the principal ramifications of QES method choice. Twenty-six articles, books, book chapters or reports were identified from the search process (Table 1 – See also Supplementary Material S1 for the full references of included papers). Each included paper was examined to identify domains that influence the choice of QES methods. In selecting works for inclusion we applied strict inclusion criteria relating to comparison of two or more methods of synthesis and presence of explicit criteria by which to inform selection of an appropriate method. Presentation materials used in Cochrane Qualitative and Implementation Methods Group workshops were also used to inform the framework.

>> insert Table 1: Considerations when choosing a synthesis method identified from published texts <<

Expansion of preliminary framework

Mapping considerations against this initial five domain framework revealed two additional domains: the nature of the Review question and issues relating to Epistemology, leading to the new RETREAT (Review question, Epistemology, Time/Timeframe, Resources, Expertise, Audience & Purpose, Type of Data) framework (Table 2). Considerations when selecting methods of qualitative evidence synthesis were compiled from identified papers. As each additional consideration was identified supplementary strategies, requiring full-text searches of Google Scholar, were conducted for specific factors using such variants as "review question", "epistemology", "time/timeframe", "resources", "expertise", "audience and purpose" and "type of data". In addition, references from identified works were followed up, citation searches were performed on included works and contact was made with CQIMG convenors. The revised (RETREAT) framework comprises the domains outlined and defined in Table 2.

>> insert Table 2 - Domains of the RETREAT framework<<

Review of wider methodological literature against the RETREAT framework

The seven domains of the RETREAT framework were mapped against wider methodological literature describing 15 QES methodologies previously identified by the Cochrane Qualitative and Implementation Methods Group (See Table 1). Identified documents were used to assess the extent to which each review method addressed each consideration.

3. Results: Applying the Framework

The following section draws upon the INTEGRATE-HTA guidance on choosing synthesis methods[1] and visits each of the seven domains of the RETREAT framework in turn. Each subsection starts with a brief explanation of the importance of the particular criterion before exploring sources of variation between the published QES types. The subsection concludes by extending the published guidance, articulating questions that a reviewer or review team can ask to inform their choice of methods and, subsequently, to offer justification for their choice.

Review question

In common with other types of knowledge synthesis, many commentators highlight the review question as a critical consideration when choosing QES methods. The review question determines the type of data required to address that type of question, which in turn determines the specific approach used to collect and analyse that data. Within qualitative syntheses the question can be **fixed**, comparable with the *a priori* PICO (population, intervention, comparison, outcome) question of an effectiveness review, or **emergent**, analogous to grounded theory approaches to qualitative research; the question structure can either be an "anchor" with pre-defined parameters or a "compass" offering a general direction of travel without predetermining its limits[21]. Generally speaking, interpretive QES review methods, such as Meta-Ethnography, are likely to address an emergent question while aggregative approaches, such as Meta-Aggregation, are likely to be fixed. Where a qualitative synthesis seeks to complement an existing or planned intervention review the question is likely to be fixed and co-terminous with the intervention question. Occasionally, however the qualitative review team must extend their scope to the experience of living with the target condition (i.e. going broader)[22]...

Frameworks for articulating a question to be answered by qualitative research include Population-Intervention-Comparison-Outcome (PICO) [23], Population-phenomenon of Interest-Context (PICo) [24], Setting-Perspective-phenomenon of Interest-Comparison-Evaluation (SPICE)[25], (Sample-Phenomenon of Interest-Design-Evaluation-Research type (SPIDER)[26] and Population-Intervention-Comparison-Outcome-Context (PICOC)[27]. Several variants acknowledge the relative importance of Setting/Context and of Perspective within qualitative questions. An exhaustive list of question variants and their component elements is available in the project report[1]. Published guidance produced by the CQIMG informs identification of the review question[28].

When selecting a QES method a review team should consider:

- **To what extent is our Review question already fixed (an "anchor") or likely to be emergent (a "compass")[21]?**

- **Is our review planned as a stand-alone project or is it intended to be compatible with, or even integrated within, an effectiveness review?**

Epistemology

Although frequently taken for granted when ranged alongside practical constraints, the epistemology underpinning a review methodology is a further key consideration. Commentators affirm that a reviewer should be mindful of the need to not violate the philosophical foundations or the integrity of the qualitative primary studies[10, 29]. Ring and colleagues vividly illustrate how those synthesizing qualitative research may approach studies from differing epistemological stances:

> "A researcher synthesising qualitative studies to inductively understand a social phenomenon may adopt a different method from one synthesising qualitative studies with the purpose of better understanding the effects of an empirically-tested clinical intervention. Alternatively, a researcher planning to synthesise qualitative research primarily as a means of generating theory may use a different approach from one who intends to apply the results to answering a specific clinical question"[10].

Barnett-Page & Thomas[11], and latterly Gough and colleagues[30], locate synthesis on a continuum from Idealist to Realist affirming that "genuine differences in approach to the synthesis…to some extent…can be explained by the epistemological assumptions that underpin each method"[11]. Idealist approaches "tend to have a more iterative approach to searching (and the review process), have less a priori quality assessment procedures and are more inclined to problematize the literature"[11]. In contrast, realist approaches are "characterised by a more linear approach to searching and review, have clearer and more well-developed approaches to quality assessment, and do not problematize the literature"[11]. We similarly observe that methods such as Meta-Ethnography and Grounded Formal Theory frequently invoke epistemological considerations at each stage of the review process. Other methods, including Best Fit Framework Synthesis, Narrative Synthesis and Thematic Synthesis use a methodology that is less overtly dependent on the epistemology underpinning each respective method.

Gough and colleagues explain that "aggregative" reviews tend to assume that, within disciplinary specifications/boundaries, a reality exists about which empirical generalizations can be made, even if this reality is socially constructed[30]. In contrast, "configurative" reviews often take a relativist idealist position where interest lies, not in seeking a single 'correct' answer but in examining the variation and complexity of different conceptualizations[30]. However, some methodologies, notably Ecological Triangulation, can be both idealist and realist[11]. Toye and colleagues similarly divide synthesis into "(a) those that aim to describe or 'aggregate' findings and (b) those that aim to interpret these findings and develop conceptual understandings or 'theory'"[31]. Synthesis types do not necessarily cluster around this often-cited distinction between aggregative and interpretive (or configurative) reviews. For example, Meta-Aggregation[32] carries a strong philosophical component. Theory can be integrated in a QES at multiple diverse levels ranging from the instrumental/practical through to the overarching conceptual[33].

When selecting a QES method a review team should consider:

- **To what extent do we wish to acknowledge the different underpinning philosophies of included studies, and to operationalise these differences, within our final review product?**
- **Where does our review team position itself with regard to an idealist-realist continuum?**
- **What is the intended role of theory within our planned review – will we ignore, acknowledge, generate, explore or test theory within our review[30].?**

Time/ Timeframe

While time (intensity) and timeframe (duration) should never singly determine the choice of QES method they may serve to moderate final selection from a longer list of valid alternatives. Specific variables that impact upon the time taken to conduct a QES include the complexity of the methodology, the number of review processes to be conducted, the extent of the candidate literature, the number of studies ultimately included and the conceptual richness/contextual thickness of the data (that is the extent to which a review team needs to engage with the underpinning theoretical base for, or the context surrounding, a particular intervention)[34]. This large number of variables may explain why some commentators characterise meta-ethnography as less time intensive (because of limited numbers of studies)

[31] while others emphasise how "it is important to be able to think conceptually when undertaking a meta-ethnography, and it can be a time-consuming process" (i.e. given the complexity of methods and the ambition of the interpretation)[35]. Some of these variables can be negotiated or modified; for example, by negotiating scope or in adopting a purposive sampling approach. Time taken also relates to the degree of iteration and the extent to which the final review product seeks to integrate products from different workstreams.

Some QES methods facilitate rapid approaches. Meta-aggregation avoids re-interpretation of included studies, but instead seeks to accurately and reliably present findings from included studies as intended by the original authors[36]. Best fit framework synthesis uses an external framework to facilitate data extraction[20, 37, 38]. or by engaging with the literature at a "body of evidence" level, rather than focusing on individual within-study findings (e.g. meta-study and its components meta-theory and meta-method). Thematic synthesis offers a "graded entry" approach as "development of descriptive themes remains 'close' to the primary studies" while "the analytical themes represent a stage of interpretation whereby the reviewer 'go beyond' the primary studies and generate new interpretive constructs, explanations or hypotheses"[39]. It is important for a review team to recognize that some methods, while still achievable within tight timescales, may be particularly vulnerable to a lack of time or the pressures of reviewing large numbers of studies. For example, a review team's ability to identify third-level constructs within a meta-ethnography is impaired if they have limited time to spend, either per study or collectively, on analysis. Consequently, the review may perform less satisfactorily against published reporting standards. The corollary is that time-intensive interpretive methods of synthesis, such as meta-ethnography, can justify sampling that is "purposive rather than exhaustive because the purpose is interpretive explanation and not prediction"[40].

When selecting a QES method a review team should consider:

- **Will our review seek to generate knowledge de novo or to use existing knowledge resources (categories, classifications, frameworks or models) as a vehicle for accelerating the review process?**

- **Is our intention to aim for comprehensive coverage of all studies that meet our eligibility criteria or to accelerate the review process through purposive**

sampling? Overall, will our review strategy privilege breadth of scope or depth of interpretation?

Resources

In addition to Time, the availability of Resources impacts upon the feasibility of preferred review approaches. People (in terms of their collective contribution of skills (see Expertise below) and effort devoted to the project) and Funding (considerations such as inter-library loans, expenses for meetings, technologies or software) shape the overall project and, ultimately, determine what is feasible. Certain methods are facilitated by the availability of specialist software (e.g. Joanna Briggs Institute software for meta-aggregation) while line-by-line coding, as one variant of thematic synthesis, may require access to NVivo or Atlas.Ti software[41]. Synthesis studies "range from small scale projects (to inform local practice) … to funded projects with a practice and policy focus" [31]. Iterative projects require frequent face-to-face meetings or tele-conferences. Successful integration of stakeholder views within a review project, perhaps to elicit programme theory for use within logic models, requires additional time and resources in addition to complex logistical planning.

When selecting a QES method a review team should consider:

- **To what extent is our review predominantly a literature-based project and to what extent must we factor wider involvement and collaboration into our funding plans?**

- **Do the methods to which our team is gravitating rely heavily upon proprietary software or enabling technologies or could we develop generic in-house solutions (e.g. based on use of spreadsheets, Google Forms, etcetera)?**

Expertise

All QES methods require generic synthesis expertise (including searching, data extraction, quality assessment, interpretation) and access to topic expertise. For example, our INTEGRATE-HTA exemplar project on palliative care required access to information specialists, review methodologists, topic experts on palliative care and consultation with service users and their carers[42]. Certain QES methods place heavy requirements for methodological expertise in primary qualitative techniques such as Grounded Theory, Framework Analysis, Thematic Analysis). Iterative QES methods may require on-call

access to expertise in searching, for example in searching for theory[43,44] or for "clusters" of related studies[34], or instant access to interpretation from content experts. A review team should be aware that although most methods engage with a common set of skill domains these may require markedly different levels of expertise. This disciplinary, methodological and perspective mix shapes how the review team collectively approaches the review. Campbell et al argue "Meta-ethnography is a highly interpretative method requiring considerable immersion in the individual studies to achieve a synthesis. It places substantial demands upon the synthesiser and requires a high degree of qualitative research skill"[45]. In contrast, Tufanaru states that meta-aggregation is "author-oriented" and "text-oriented", as opposed to being "reviewer oriented" and "interpreter oriented"[46].

Even the same reviewer may contribute different expertise to different reviews; whether from review experience, clinical experience or disciplinary background (e.g. psychology or sociology). The focus of a particular review may shape these requirements; a review of implementation is strengthened by clinical experience whereas a theory-oriented review may access theories from contributing disciplines. Interpretive methods of synthesis such as Meta-Ethnography typically require at least one member of the research team who is already familiar with the method. In contrast, methods derived from primary qualitative methods e.g. thematic synthesis (from thematic analysis) and framework synthesis (from framework analysis) may be sustained by primary qualitative expertise present within the team. Methods such as meta-interpretation possess relatively small user communities making access to expertise, advice and support potentially problematic.

When selecting a QES method a review team should consider:

- **To what extent do we already possess necessary skills and expertise within our core team?**
- **What patterns of expert input will our preferred QES method require during the life-span of the review project; anticipable or *ad hoc*, intensive or periodic?**

Audience and purpose

Increasing sophistication in the planning and conduct of knowledge synthesis projects[47] has revealed how important it is to be familiar with the needs of the audience and with the intended purpose of the review. Is the intended audience policy-makers, front-line practitioners, patients or the public or, as increasingly the case, is the synthesis conceived as

multi-purpose and thus requiring some compromise in features? We need to consider whether our synthesis targets a local audience or whether it seeks global utilization of review findings. Practice-oriented syntheses that seek to influence or change current practice must offer directive actionable statements compared to those that seek to enhance or enlighten current understanding. A QES may be designed for use alongside complementary effectiveness reviews, may occupy a place within a portfolio of systematic review work or may provide the bedrock for accompanying guidelines. Such concerns influence the choice of method and shape the resultant synthesis. Finally, certain audiences are already pre-conditioned and receptive to primary qualitative research and/or QES. Others need to be "educated" regarding the methods and underlying assumptions throughout a transparent review process.

Also with regard to Audience, outputs from some methods of synthesis (Thematic Synthesis, textual Narrative Synthesis, Framework Synthesis, and Ecological Triangulation) are "more directly relevant to policymakers and designers of interventions than the outputs of methods with a more constructivist orientation (Meta-Study, Meta-Ethnography, Grounded Theory) which are generally more complex and conceptual"[11]. Thomas & Harden conclude that Thematic Synthesis (including Meta-Aggregation) and Framework Synthesis produce findings that directly inform practitioners[39].

At the point of delivery, the output of qualitative evidence syntheses may appear similar, masking earlier methodological considerations. Generic reporting standards exist for QES (ENTREQ)[48] and have been recently developed for meta-ethnography (eMERGe)[49]. Guidance on selection of reporting standards for QES has been published by the CQIMG[50]. Optimal report design features may be harnessed across a variety of QES methods e.g. design of structured summaries, bullet points, figures, diagrams and infographics and various tools can mediate between the less accessible characteristics of a methodology and the needs of the target user e.g. use of briefings, vignettes, rich pictures or models. Nevertheless, a review team must give serious prior consideration to how the intended audience plans to use the projected output. For example, systematic review findings occupy a continuum between description and interpretation. A descriptive review finding might state: "Based on two studies from Norway and one from Germany, patients receiving palliative care experienced difficulties in verbalising anticipated future consequences of their illness". An interpretive finding might read: "Patients receiving palliative care exhibited the presence of denial, as a defence mechanism (according to psychoanalytic theory), when verbalising anticipated

future consequences of their illness". Different review methods vary in their balance between descriptive and interpretive findings. Description asks "What does the data say?". A review team may pass the burden of interpretation to the reader who seeks patterns in the data and findings. Description requires clear and transparent methods of presentation. In contrast, interpretation addresses "What does the data mean?", yet this interpretation may be contested. For descriptive reviews Framework Synthesis, Thematic Synthesis or Meta-Aggregation may be required. An interpretive approach may require Meta-Ethnography or Grounded Formal Theory.

When selecting a QES method a review team should consider:

- **What does our review team know about the preferences of our intended primary audience with regard to types of findings and data presentation? Descriptive or interpretive, textual or graphical, practical recommendations or conceptual enlightenment?**

- **How do our intended audience plan to use our synthesis product? Can we access past examples of review methods used by knowledge synthesis outputs aimed at this particular audience and/or for a similar purpose?**

Type(s) of data

Richness and thickness are often used interchangeably, however previously we have differentiated these concepts[34]. Richness refers to the conceptual detail of the included studies, that is the degree to which the studies sustain theoretical development and explanation. Thickness refers to the extent to which included studies allow identification of the situational context. When data from studies are rich and/or thick a review team is limited in the number of studies that they can collectively comprehend and process. "Thin" data, from brief case reports or textual responses to surveys, will not sustain contextual interpretation. Where data is "thin" the choice of QES methods may be limited to Meta-Aggregation, Thematic Synthesis, Framework Synthesis and Narrative Synthesis–type approaches. Integration of quantitative and qualitative data leads a review team towards a separate menu of choices whereby approaches such as Narrative Synthesis[51], Realist Synthesis[52] or EPPI-Centre (Matrix) Methods[53] may prove useful. Increasingly, the scoping process is used to provide an early indication of the quantity, quality, conceptual richness and contextual thickness of candidate studies; the type of qualitative study and the nature of

the source (e.g. the type of journal or whether a thesis or a journal article) can permit an indicative, but not definitive, assessment.

Commentators are understandably reluctant to specify numbers of studies when selecting QES methods. Nevertheless, some useful rules of thumb have been suggested. Paterson (2011) describes how the "available primary research may be too few or too many, too homogenous or too heterogeneous, to enact the procedures of a particular synthesis method in the way the developers prescribe"[54]. Wilson & Amir rejected meta-ethnography upon discovering that six heterogeneous primary research reports were so different as to prevent reciprocal translation[55]. In essence, they settled for a form of thematic synthesis. Also in connection with meta-ethnography Noblit and Hare considered that 'few studies are sufficient'[56], but did not define 'few'. Interestingly none of the examples they present involve more than six studies. Campbell and colleagues argue that meta-ethnography is best suited to synthesising a limited ($n < 40$) number of studies[45]. Toye and colleagues report that, through methodological innovation they were able to produce a meta-ethnographic synthesis that included 77 studies[31]. Descriptive approaches (Meta-Aggregation and Thematic Synthesis) can accommodate larger numbers of studies. Meta-study[57] capitalises on large numbers of studies in yielding insights from the collective evidence base. At the other extreme, meta-synthesis has been undertaken with only three studies[58]. However, Paterson and colleagues suggest that at least a dozen discrete studies are needed to make synthesis meaningful[57]. Guidance on extracting data from qualitative research reorts has been published by the CQIMG[59].

When selecting a QES method a review team should consider:

- **How conceptually "rich" are included studies likely to be?**
- **How contextually "thick" are included studies likely to be?**
- **How many studies will we analyse and what is their "typical" methodological quality?**

3. Illustrating the RETREAT Framework

We have found the RETREAT framework to be a useful teaching tool when asking course participants at diverse training events to analyse hypothetical or real review scenarios. However, we do not yet know how these criteria are operationalized in practice and whether,

or under what circumstances, participants weight particular factors more or less heavily than others. Boxes 1 and 2 illustrate how the seven RETREAT criteria can be usefully applied to contrasting decision scenarios[60,61].

>> insert Box 1 – Illustrative Use of RETREAT Framework within an actual review scenario[60]<<

>> insert Box 2 – Illustrative Use of RETREAT Framework within an actual review scenario[61]<<

4. Conclusions and next steps

The foregoing brief overview reveals that choice of synthesis is a complex multifactorial decision requiring consideration of multiple criteria[54,62]. Such complexity defies encapsulation within any single algorithm. A recent attempt to examine motivations for the choice of review types more generally[63] has been criticized for its over-simplification in reducing a multifactorial decision into a single decision path[64,65]. When such an algorithm has been attempted by commentators[13] it necessarily affords primacy to one or more guiding variables (e.g. the role of theory). It is not yet clear which considerations should be prioritised and so we present a matrix to be examined for each planned review (Supplementary Table), supported by some questions and prompts (Table 3).

>> insert Table 1 - Aggregated prompts for the RETREAT Criteria<<

This paper distils extensive considerations[1] which are themselves extracted from a plethora of nuanced methodological guidance and collective experience. We believe that the factors identified, and supported from the methodological literature, can inform and yet not direct, the appropriate selection of QES methods. In this paper we focus on methods for qualitative evidence synthesis; the full INTEGRATE-HTA guidance[1] also includes methods that accommodate and/or integrate both quantitative and qualitative data such as critical interpretive synthesis, meta-narrative and realist synthesis. However, recent guidance affirms that the methodological evidence base for integrating quantitative and qualitative syntheses is less advanced[66] and so application of the RETREAT domains, although equally likely to be valid, is less well substantiated at present.

Many RETREAT factors are interdependent: an interpretative review method, such as meta-ethnography, will typically require more Expertise, probably more Time and other Resources and will only be sustained by conceptually rich Types of data and an explicit Epistemological positioning. However, we suggest, in the absence of empirical evidence, that the twin considerations of the Review Question and the Audience and Purpose have a strong claim to being privileged. A knowledge of the Type of Data informs the choice of analytical techniques and indicates whether Review Question, Type of Data and Audience and purpose are aligned. Secondary considerations, moderating the final choice, rather than determining the ultimate decision will include the available Resources for the review; the Time, and the requisite Expertise. Finally, a review team will wish to reflect on the extent to which candidate methods cohere with the underlying Epistemology that supports the review, locating the method on an Idealist-Realist continuum.

We recognize that privileging the Review Question and the Audience and purpose among the RETREAT factors, as described above, favours conceptual considerations, rather than practical concerns, although in mitigation they draw heavily on the published experience captured in methodological guidance and actual examples of QES and are confirmed by our hands-on experience of many of these review methods. The usefulness of these pointers would be considerably enhanced by detailed empirical work comparing and contrasting methods both directly (i.e. head to head) and indirectly through methodological compendia. If "pushed" to offer guidance, when the picture of RETREAT is either equivocal or incomplete, we typically offer an alternative "risk-averse" strategy; recommending the most accessible method of synthesis, thematic synthesis in the absence of other positive indications. Thematic synthesis carries the added utility of resembling the first stage of meta-ethnography should the source data prove to be sufficiently rich[11].

We anticipate that, while the overall framework will stand the test of time, the detail of considerations will become progressively granular and specific. We welcome the opportunity for continued debate within the methodological "doers" community as well as the "users" community on the most effective approaches to choosing an appropriate QES method.

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Table 1: Considerations when choosing a synthesis method identified from published texts

	Review Question	Epistemology	Time/ Timeframe	Resources	Expertise	Audience & Purpose	Type of Data
Paterson et al (2001)						✓	
Sandelowski & Barroso (2003)						✓	✓
McDermott et al (2004)						✓	
Dixon-Woods et al (2004; 2005)	✓				✓		
Mays et al (2005)[15]	✓						
Lucas et al (2007)						✓	
Pope et al (2007).	✓	✓			✓		✓
CRD (2008)	✓				✓		✓
Garside (2008)					✓		✓
Barnett-Page & Thomas (2009)		✓			✓	✓	
Ring et al (2010)	✓	✓				✓	
Manning (2011) [In Hannes & Lockwood, 2011]	✓				✓	✓	
Noyes & Lewin (2011)	✓			✓	✓		✓
Paterson (2011) [In Hannes & Lockwood, 2011]		✓	✓	✓	✓	✓	✓
Urquhart (2011)	✓					✓	✓
Booth (2012)			✓	✓	✓	✓	✓
Gough et al (2012)	✓	✓	✓	✓	✓	✓	
Saini (2012); Saini & Shlonsky (2012)	✓	✓					
Shaw (2012)	✓					✓	
Snilstveit et al (2012)	✓		✓	✓		✓	✓
Tong et al (2012)	✓	✓				✓	✓
Greenhalgh & Wong (2014)	✓	✓	✓	✓	✓	✓	
Toye et al (2014)		✓		✓	✓		✓
Whitaker et al (2014)	✓						✓

Table 2 - Domains of the RETREAT framework

Domain	Definition
Review question	A clear and detailed specification of the research question(s) to be addressed by the review
Epistemology	The assumptions on the nature of knowledge that underpin the synthesis method and the extent to which these permit the review team to achieve their purpose
Time/Timeframe	Logistic constraints regarding the expected completion date of the synthesis and the cumulative amount of effort required to deliver the review.

Resources	Financial and physical support and infrastructure required to deliver the review
Expertise	Knowledge and skill domains required by the review team and the wider network supporting the review
Audience & purpose	Requirements and expectations of the intended recipients of the review and how review findings are intended to be used.
Type of Data	The richness, thickness, type (quantitative/qualitative), quality and quantity of data available to address the review question.

Box 1 – Illustrative Use of RETREAT Framework within an actual review scenario[60]

Scenario
An academic team of experienced qualitative researchers has received one year's funding via a combined local and national grant to explore the complex reality experienced by the patient who wishes to die. They seek a detailed approach to understanding the Wish to Hasten Death (WTHD), to help define its conceptual limits and to understand why patients might express such a wish. Given that the patient's perspective is critical, they seek qualitative research that is specifically designed to understand subjective experience by focusing on the description and interpretation of the meaning of a given phenomenon, opening the way to explore the concept in greater depth. They have identified at least eight conceptually rich qualitative research studies that analyse the wish to die from the viewpoint of the patient who expresses it. The aim of this systematic review of qualitative studies is to enhance current conceptualisation of the meaning and motivation of the WTHD in patients with chronic illness or advanced disease.
RETREAT Criteria
Review question: **Explanatory question** - To analyse, through an interpretative systematic review of qualitative studies, the meaning and motivation of the WTHD in patients with chronic illness or advanced disease
Epistemology: Objective idealism within a constructivist frame. Although each

study had its own methodological approach/philosophical underpinnings the synthesis "followed other authors in focusing on the substantive area addressed by the study rather than on the specific methodology used."

Time/ Timeframe: One year; not rapid but thorough

Resources: Externally funded project with a large team

Expertise: Specialist qualitative research skills. Access to an information specialist for design of the strategy.

Audience and Purpose: Primarily an academic, specialist audience, not conducted within the context of an intervention review or health technology assessment (HTA). Report is stand-alone – for enlightenment not immediate action.

Type(s) of Data: Identified seven qualitative studies that used recognised qualitative methods of data collection and data analysis. Rich data with conceptual content.

Choice of Method = Meta-ethnography

Justification of choice: This interpretative QES seeks to generate and extend existing theory on the phenomenon of interest. It does not directly seek to provide recommendations for practice. It is informed by rich, thick data from fully-reported qualitative research studies extending the interpretative ambition of the QES beyond Thematic Synthesis or Framework synthesis.

Box 2 – Illustrative Use of RETREAT Framework within an actual review scenario[61]

Scenario

A team of academic nurses are working within an internal University research group to develop practical guidance for young patients who experience pain. In order to better support adolescents to relate to their pain such that it does not lead to chronic or persistent pain, they have identified a need for more knowledge about adolescents; own thoughts and experience according to pain experience. The objective of this systematic review is to identify and synthesize the best available evidence from qualitative primary studies on how adolescents and young adults'

experience living with everyday pain. Studies are likely to be "thin" in detail although relatively plentiful.
RETREAT Criteria
Review question: **Descriptive question** - What are the experiences of adolescents and young adults (AYA) living with everyday pain?
Epistemology: Pragmatism used to develop "lines of action".
Time/ Timeframe: One year according to standard systematic review timeframe
Resources: Externally funded project with a team of at least two reviewers with information support.
Expertise: Generic qualitative research skills. Access to an information specialist for search process.
Audience and Purpose: Target audiences are academics and health professionals from across the health disciplines, including nurses, doctors, allied health professionals, managers, administrators and decision makers in healthcare. **T**ype(s) of Data: Any qualitative studies regardless of their philosophical perspectives, methodologies or methods. In the absence of research studies, other texts such as opinion papers and reports will be considered.
Choice of Method = Meta-aggregation **Justification of choice:** This descriptive QES does not seek to contribute to existing theory. It explicitly seeks to inform recommendations for current practice. Available data is relatively thin, derived from practice-based case studies in professional journals, and is unlikely to sustain an interpretative approach.

Table 1 - Aggregated prompts for the RETREAT Criteria

RETREAT Criteria	Prompts
Review question	Rx1. To what extent is our Review question already fixed (an "anchor") or likely to be emergent (a "compass")?
	Rx2. Is our review planned as a stand-alone project or is it intended to be compatible with, or even integrated within, an effectiveness review?

Epistemology	Ep1. To what extent do we wish to acknowledge the different underpinning philosophies of included studies, and to operationalise these differences, within our final review product?
	Ep2. Where does our review team position itself with regard to an idealist-realist continuum?
	Ep3. What is the intended role of theory within our planned review – will we ignore, acknowledge, generate, explore or test theory within our review?
Time/ Timeframe	Ti1. Will our review seek to generate knowledge de novo or to use existing knowledge resources (categories, classifications, frameworks or models) as a vehicle for accelerating the review process?
	Ti2. Is our intention to aim for comprehensive coverage of all studies that meet our eligibility criteria or to accelerate the review process through purposive sampling? Overall, will our review strategy privilege breadth of scope or depth of interpretation?
Resources	Re1. To what extent is our review predominantly a literature-based project and to what extent must we factor wider involvement and collaboration into our funding plans?
	Re2. Do the methods to which our team is gravitating rely heavily upon the availability of proprietary software or enabling technologies or could we develop generic in-house solutions (e.g. based on use of spreadsheets, Google Forms, etcetera)?
Expertise	Ex1. To what extent do we already possess necessary skills and expertise within our core team?
	Ex2. What patterns of expert input will our preferred QES method require during the life-span of the review project; anticipable or *ad hoc*, intensive or periodic?
Audience	A1. What does our review team know about the preferences of our intended primary audience with regard to types of findings and data presentation? Descriptive or interpretive, textual or graphical, practical recommendations or conceptual enlightenment?
	A2. How do our intended audience plan to use our synthesis product? Can we access past examples of review methods used by knowledge synthesis outputs aimed at this particular audience and/or for a similar purpose?
Type(s) of Data	Ty1. How conceptually "rich" are included studies likely to be?
	Ty2. How contextually "thick" are included studies likely to be?
	Ty3. How many studies will we analyse and what is their "typical" methodological quality?