Research Paper

JIS

Journal of Information Science
1–33

DOI: 10.1177/01655515221114452
journals.sagepub.com/home/jis


A Tailored Approach: A model for literature searching in complex systematic reviews

Chris Cooper
Population Health Sciences, Bristol Medical School, University of Bristol, UK

Andrew Booth
The University of Sheffield, UK

Kerryn Husk
University of Plymouth, UK

Rebecca Lovell
University of Exeter Medical School, UK

Julia Frost
University of Exeter Medical School, UK

Ute Schauberger
Healthcare Improvement Scotland, UK

Nicky Britten
University of Exeter Medical School, UK

Ruth Garside
University of Exeter Medical School, UK

Abstract

Our previous work identified that nine leading guidance documents for seven different types of systematic review advocated the same process of literature searching. We defined and illustrated this process and we named it 'the Conventional Approach'. The Conventional Approach appears to meet the needs of researchers undertaking literature searches for systematic reviews of clinical interventions. In this article, we report a new and alternate process model of literature searching called 'A Tailored Approach'. A Tailored Approach is indicated as a search process for complex reviews which do not focus on the evaluation of clinical interventions. The aims of this article are to (1) explain the rationale for, and the theories behind, the design of A Tailored Approach; (2) report the current conceptual illustration of A Tailored Approach and to describe a user's interaction with the process model; and (3) situate the elements novel to A Tailored Approach (when compared with the Conventional Approach) in the relevant literature. A Tailored Approach suggests investing time at the start of a review, to develop the information needs from the research objectives, and to tailor the search approach to studies or data. Tailored Approaches should be led by the information specialist (librarian) but developed by

Corresponding author:
Chris Cooper, Population Health Sciences, Bristol Medical School, University of Bristol, Bristol BS8 1QU, UK.
Email: lq22066@bristol.ac.uk

the research team. The aim is not necessarily to focus on comprehensive retrieval. Further research is indicated to evaluate the use of supplementary search methods, methods of team-working to define search approaches, and to evaluate the use of conceptual models of information retrieval for testing and evaluation.

Keywords
Information science; systematic reviews; Tailored Approach; the Conventional Approach

1. Introduction

Our previous work identified that nine leading guidance documents for seven different types of systematic review advocated the same process of literature searching for study identification [1]. This finding suggests that researchers are guided to search for systematic reviews in the same way, irrespective of the type of systematic review they are undertaking or the data they need to identify to address their research question.

Our work represented the first time that guidance for study identification had been reviewed and the process of literature searching summarised across different types of systematic reviews [2]. We illustrated the search process using a conceptual model made up of nine stages, and we named the process 'the Conventional Approach', as the methods reported were common convention to leading guidance documents (see Supplemental Figure 5, web-only material). The Conventional Approach appears to suit the needs of researchers undertaking systematic reviews of clinical interventions since it is focused on a transparent report of a comprehensive approach to study identification which aims to minimise bias [2,3].

Our work raised questions about how researchers search for studies for systematic reviews, here we focus on two; one relates to theory and the other to practice.

1.1. A question of theory

The origin of the Conventional Approach is unclear [2]. Was it developed a priori for use in systematic reviews, or has the process emerged organically, and over time, to meet the needs of researchers undertaking literature searching for systematic reviews, and responsively to meet the demands of decision-makers using reviews? The information science literature reports numerous information-processing models which seek to illustrate and examine information-seeking behaviour. The practice of using theoretical models to illustrate and then to evaluate the process of literature searching does not appear to have been adopted as tool to explain and test information retrieval strategies for systematic reviews in the published literature [2]. We wondered, why?

1.2. A question of practice

It is also necessary to ask whether it is appropriate to use the same process of literature searching to identify studies reporting randomised or controlled trials for reviews of clinical interventions as for studies reporting qualitative data for qualitative evidence synthesis? It is true that both types of review require a transparent account of the literature search process; however, the study types needed for one review are materially different from the other. Similar challenges in applying a model of literature searching optimised for systematic reviews of clinical interventions extends to other types of systematic review or evidence synthesis, namely: reviews of economic evaluations, reviews of complex interventions, reviews of diagnostic or prognostic test accuracy, and reviews of theory. Should the process of literature searching used for these reviews account for different study types and should researchers search differently depending on the type of review that they undertake?

This study seeks to bridge the gap between theoretical and conceptual information retrieval process models [4–13] and the practical experience and tacit knowledge gained from undertaking systematic reviews in practice [14,15]. In response to the questions raised above, this article reports the conceptual design of and the theory behind a new information retrieval model for use in complex systematic reviews. We call this model 'A Tailored Approach' since it aims to tailor the literature search approach/process to the type of review undertaken and the studies from which an appropriate synthesis could be undertaken. We submit the Tailored Approach as one potential alternative to the Conventional Approach [2].

2. Article aims

The aims of this article are

1. To explain the rationale for and the theories behind the design of A Tailored Approach;
2. To report the current conceptual illustration of A Tailored Approach and to describe a user's interaction with the process model; and
3. To situate the elements novel to A Tailored Approach (when compared with a Conventional Approach) in the relevant literature to explore the implications of this model for researchers.

2.1. Article structure

The article is structured by the three aims above. This reporting structure conforms to other articles which have set out and reported information retrieval models [4,8,9,11]. Ellis [8], for instance, established the case for his proposed model, then reported the structure and design of the model, before situating it in context. Bates' [4] Berry Picking model has a similar structure (albeit presenting the same themes in a slightly different order). We aim to follow this method of presentation with similar aims: to identify what we see as the need for the proposed model, to describe the model, and to locate where in the information retrieval pathway or evidence synthesis ecosystem our proposition might sit. One area we have experimented with, which we believe might be novel, is the description of the user's interaction with the model (covered in Aim 2). This is an area of particular interest to us, as our model proposes different applications of search methods, such that the use of the model in one case will probably not be the same in another.

2.2. Who is this article for?

This article is intended for research teams looking to develop a search approach for complex systematic reviews, as well as experienced research teams which may already undertake much of the work that we describe. While the article reflects (and it seeks to explore) the information needs of complex evidence synthesis, it is the product of information science. We attempt to link information science to evidence synthesis through the information retrieval models which have historically been used to examine (and attempt to explain) a user's interaction with an information retrieval problem. In this article, we take the problem of searching for complex reviews, and we examine (and attempt to explain) an information retrieval solution. This work is illustrated with practicable examples of evidence synthesis, which we hope will support information professionals, academic librarians, and researchers, who may be unaware of the use of models to explain information retrieval but are responsible for the development of searches to support complicated reviews or, conversely, are aware of the rich heritage of information science and models but seek guidance in their work.

2.3. Definitions used in this article

Definitions used in this article are set out in Table 1.

2.4. Evidence cited in this article

This article draws from three discrete sources of evidence and one case study to address the aims above:

- Eleven[1] leading systematic review guidance handbooks [18–28];
- Nine models of information retrieval practice (see Table 2) [4–12,29,31];
- Evidence and supporting studies identified as part of a broader body of work, namely the literature review which identified and defined the Conventional Approach [1] and a research project undertaken by the first author which is reported in full elsewhere [2]; and
- A case study comparing the Conventional Approach with A Tailored Approach [14].

We describe the last two points in greater detail in Table 3. The aim of Table 3 is to provide a brief but fuller description of the broader body of work and the case study for a reader who may be unfamiliar with this work and seeks to situate this article in context of the supporting work.

Table 1. Definitions used in this article.

The Conventional Approach	A conceptual model and process of information retrieval developed for use in systematic reviews of interventions effectiveness and subsequently adopted in other types of systematic review [2]. The conceptual model is described in full elsewhere [1,2].
Complex reviews	We use the definition of complex reviews by Mahtani et al. [16]: 'A systematic review, performed by a multidisciplinary team, consisting of multiple components, large amounts of data from different sources or different perspectives, collectively contributing more than would be expected from their individual contributions, the individual components not being easily coordinated, analysed or disentangled'. These reviews might be reviews of complex interventions, mixed methods reviews, qualitative evidence synthesis, reviews of prognostic or diagnostic accuracy, reviews of public health topics, and newly emerging styles of reviews such as rapid, scoping, and mapping reviews.
Information professional	This term is used to indicate the following professional groups: Information specialists, information scientists, and librarians.
Research team	This is a broad term to encompass the people charged with undertaking a complex review or synthesis. It includes the information specialist, researchers, systematic reviewers, quantitative or qualitative research methodologists, statisticians, mathematicians: anyone who will work on the review or synthesis. It may also include topic experts, public or patient involvement, and decision-makers.
Supplementary search methods	Supplementary search methods are non-database methods of study identification, for example, contacting study authors, citation chasing, handsearching, or web searching. These have been defined in review of supplementary search methods which informs the development of A Tailored Approach [17];

3. Aim 1: to explain the rationale for and the design of A Tailored Approach

3.1. The rationale for a new model

The origin of what we term the Conventional Approach is unclear but it appears to have emerged from the early to mid-1990s and to have evolved as a process to meet the needs of users of, and researchers undertaking, systematic reviews in order to determine the effectiveness of clinical interventions [2]. The Conventional Approach is premised on the belief that it is possible to identify comprehensively all relevant studies which it is thought are necessary to generate a reliable estimate of intervention effect [2,18,19,27,32–36]. Coupled with the development of guidance on how to report transparently the search approach in protocols and final reviews [18,22,28,37,38], the Conventional Approach has superficially met the needs of decision-makers, since an explicit link can be made between the research undertaken and the findings of the systematic review [39–41].

Our article describing the Conventional Approach reports on this in greater detail [1]. In particular, we highlight how the architecture of the literature searching process in the Conventional Approach is aligned to the comprehensive identification of studies reporting randomised trials [2]. Considerable investment has been made to improve the effectiveness and efficiency of literature searching for clinical interventions through indexing (and re-indexing) of studies reporting trials. This investment appears to have been effective [2,32,42–55] but has not been matched by a corresponding investment in the identification of other study designs, methods, or data. Nor has there been any attempt to design an approach to literature searching that offers an alternative to comprehensiveness as an indicator of search quality [2,56–63]. This realisation is nested in calls to consider how we identify studies and approach systematic reviews and if this can be, or should be, done differently [25,33,64–74].

3.2. Why do we need a new model of searching?

The challenges set out above reflect the origin of A Tailored Approach. On the evidence of our case study, and shared experience undertaking complex systematic reviews and evidence synthesis, we contend that the current model of searching used in systematic reviews and evidence syntheses (The Conventional Approach) does not handle the complex needs of complex systematic reviews and syntheses. Compare the following types of research question:

3.2.1. Example 1: a clinical effectiveness review. What is the effectiveness of Dasatinib compared with standard-dose Imatinib for first-line treatment of chronic myeloid leukaemia? Here:

Table 2. Nine conceptual models used to explore the Conventional and Tailored Approach to literature searching.

Model name	Author (date)	See figures in web-only material	Description of the model	Does the model provide an alternative approach for complex reviews	Brief description of theories sourced from the models (see also Table 3)
1. The process of asking questions and question negotiation [11]	Taylor (1962)	6	The model focuses on how users (researchers) formulate research enquiries and how the librarian translates these into search enquires to identify and then resolve information needs. Taylor explores this by organising question negotiation into visceral, conscious, formalised and compromised expressions.	No. The model predates the advent of systematic reviews, and it does not explain a process of systematic searching.	The model's contribution is on question formulation and the importance of clarifying the information needs prior to searching. What may be clear for one person might not be clear for another. A unified understanding of search purpose is important when searching for complex systematic reviews.
2. Anomalous state of knowledge (ASK) [5,6]	Belkin and colleagues (1980, 1982)	7	Belkin argues that traditional information retrieval models focus on the effective and efficient transfer of desired information between human generator and human user. That is, the traditional information retrieval models focus on the system of information retrieval or how information passes between where it stored and the person requesting information. Belkin, building on the work of Taylor, focuses on the user. Belkin agrees with Taylor that the articulation of the search enquiry is important to resolving a search request. Belkin argues that the expression of a search enquiry is limited not by what the user knows but what they do not know. Belkin calls this the Anomalous State of Knowledge (or ASK). Belkin's model seeks to acknowledge this issue.	No. The model predates the advent of systematic reviews, and it does not explain a process of systematic searching.	Similar to Taylor, the contribution is on question formulation, but it adds to Taylor's work by seeking to address the uncertainty in search enquiry. That is, what is it that the searcher does not know. Both models suggest that the search approach should match the information needs. In contrast to The Conventional Approach, where every search method is used irrespective of value found. Belkin addresses the conflict here too, by comparing the needs/outputs of the user with the judgements made by the system used as it relates to specificity and sensitivity.

(continued)

Journal of Information Science, 2022, pp. 1–33 © The Author(s), DOI: 10.1177/01655515221114452

Table 2. (continued)

Model name	Author (date)	See figures in web-only material	Description of the model	Does the model provide an alternative approach for complex reviews	Brief description of theories sourced from the models (see also Table 3)
3. Model of information behaviour [12]	Wilson (1981)	6	Wilson's work focuses on models of information behaviour. Wilson seeks to clarify definitions which are used to explain information-seeking behaviour, in particular around information needs.	No. The model predates the advent of systematic reviews, and it does not explain a process of systematic searching.	Wilson's work on the application of theory is broadly applicable and may well translate into new models of information retrieval to meet the needs of researchers undertaking systematic reviews. Wilson argues about the definition of information needs. Where Wilson writes of 'data,' 'information' or 'knowledge' the need for similar clarification of information needs as it relates to study types, data needs or conceptual definition of research questions might apply. Wilson links information needs to search behaviour, suggesting that what you need could determine how you search. This is an influential concept in a Tailor Approach.
4. Sense-Making triangle [29]	Dervin (1983)	9	Dervin argues that behaviour guides internal (i.e. cognitive) and external (i.e. procedural) contrasts through which users define their information-seeking behaviour. This acknowledges limitations in human understanding (perhaps reflected in Belkin's ASK) and the user's position in the formulation of their information search. Sense making is responsive as user's process their search enquires and behaviour. Dervin has suggested that her model is out of date. Wilson has redrawn Dervin's diagram (see online material, Supplemental Figure 9) to reflect on Dervin's models, namely the illustration of Situation – where the sense of the search enquiry is perceived or considered; the gap – which is the information need or what information is needed to address the gap in knowledge; and uses or outcomes – that is how the information identified will either help the user or lead to further searches.	No. The model predates the advent of systematic reviews, and it does not explain a process of systematic searching.	Dervin argues that behavioural factors influence understanding and search behaviour. This is interpreted in A Tailored Approach as a strength for a team approach for problem solving to reduce the ASK. We link this behavioural approach to the models of Byström and Du (below) who analyse the user journey. Linking behaviour to the information retrieval journey (information gathering) helps unpick the nuances and complexity in searching for complex systematic reviews.

(continued)

Journal of Information Science, 2022, pp. 1–33 © The Author(s), DOI: 10.1177/01655515221114452

Table 2. (continued)

Model name	Author (date)	See figures in web-only material	Description of the model	Does the model provide an alternative approach for complex reviews	Brief description of theories sourced from the models (see also Table 3)
5. Ellis' model [8,9]	Ellis (1989) and Ellis, Cox, & Hall (1993)	10	Ellis and Ellis et al. take a behavioural position on information retrieval. This is a stance similar to the models above. Ellis broke down information seeking into six characteristics: discrete starting, chaining, browsing, differentiating, monitoring, and extracting. Ellis argues that understanding behaviour, and these characteristics, allows for a flexible model of information retrieval and behaviour.	No. The model predates the advent of systematic reviews, and it does not explain a process of systematic searching.	Ellis' contribution is not only in the fact that the stages of the model more generally align to agreed structures of searching for systematic reviews but also through the later stages, Ellis expresses some of the processes which are used by searchers but are not perhaps expressed in any existing model or system. Namely, monitoring, verifying and most importantly in A Tailored Approach 'differentiating'.
6. Berry Picking [4]	Bates (1989)	11	Bates' model acknowledges the technological shift to online information-seeking behaviour. Bates proposes that her model, Berrypicking, is closer to 'real life' information-seeking behaviour since it has an evolving search, suggesting that different search methods are used in endless variation to satisfy search enquiries. Bates' work is located in social sciences.	No. The model predates the advent of systematic reviews, and it does not explain a process of systematic searching.	Berrypicking, visually, is a direct challenge to the orthodoxy of the classic information retrieval system. As with Ellis, Bates' model – through its articulation of search methods – more broadly aligns to recognised information retrieval practice for systematic reviews. Its contribution is the non-linearity of the model and the suggestion that while models might exist which represent agreed best practice, they might not be followed by users [30]. We link this to Byström and Du who explore the user experience.

(continued)

Table 2. (continued)

Model name	Author (date)	See figures in web-only material	Description of the model	Does the model provide an alternative approach for complex reviews	Brief description of theories sourced from the models (see also Table 3)
7. The Information Search Process (ISP) [10]	Kuhlthau (1991)	12	Kuhlthau aligns with Taylor, Blekin, Dervin and Bates in questioning the search process from a behavioural point of view. The model is presented in five stages: 1. Initiation, where a user becomes aware of a lack of knowledge prompting a need for information (drawing from Taylor's gap in knowledge) 2. Selection/Exploration: to identify and select information. Discussion with others or explorative searches might be used here. This stage is characterised by uncertainty while the user develops their understanding of the knowledge gap. 3. Formulation: is described as the turning point of the model, when feelings of uncertainty in the search reduce and are replaced with feelings of confidence; 4. Collection: is where the user interacts with the information systematic collect the information needed to address their gap in knowledge; and 5. Presentation: this stage completes the model, where the findings of the search are presented.	No. The model predates the advent of systematic reviews, and it does not explain a process of systematic searching. The model does explicitly challenge the primacy of bibliographic information systems which support some of the arguments central to A Tailored Approach.	The model's contribution is on defining the 'information need.' Kuhlthau acknowledges that information retrieval problems are not all organised and linear, that many are complex.

(continued)

Journal of Information Science, 2022, pp. 1–33 © The Author(s), DOI: 10.1177/01655515221114452

Table 2. (continued)

Model name	Author (date)	See figures in web-only material	Description of the model	Does the model provide an alternative approach for complex reviews	Brief description of theories sourced from the models (see also Table 3)
8. Information needs, seeking and use (INSU) [7]	Byström and Hansen [7]	13	Byström separates information seeking from information retrieval, arguing that these tasks are never performed in isolation. The model illustrates a user's navigation from information need, through information seeking, to use and evaluation.	No. The model predates the advent of systematic reviews, and it does not explain a process of systematic searching.	Byström model conceptually links to the models above as it addresses the concerns raised first by Taylor and then by the others, that researchers have focused on matching information needs to the system and not the user. Byström's articulation and visualisation of the user journey helps explain (and remind) that behind these principally theoretical models is the user trying to navigate complexity.
9. The information journey model [31]	Du [31]	14	Similar to Byström, who focuses on the user's journey to resolution and evaluation, Du examined the 'information journey,' that is how a user seeks information. From primary work with marketing professionals, Du identified a model in five stages: 1. A work tasks identifies the need for information (this is what Taylor and others call the information need) 2. Information seeking: information is searched for; 3. Judgement and evaluation of the information – does it address the gap in knowledge?; 4. Making sense of seeking to use the information identified; 5. Information is shared especially collaboratively (this is similar to stage 2 in Kuhlthau's model where colleagues are used to explore searches or information identified).	No. The model predates the advent of systematic reviews, and it does not explain a process of systematic searching.	The contribution of Du's work is similar to Byström: it is the articulation of work-based information resolution, showing the system from the identification of need to resolution.

ASK: anomalous state of knowledge; ISP: information search process; INSU: information needs, seeking and use.

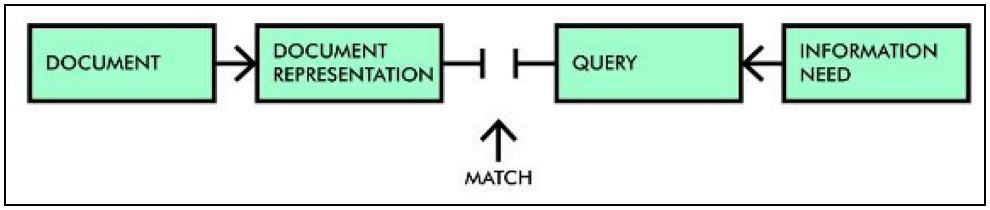

Figure 1. The classic information retrieval model.

- The research question has clearly defined interventions and comparisons (the drug Dasatinib compared with the drug Imatinib; the drugs are proper nouns: they mean only the name of the drug and not anything else);
- The population of the review is unified and clearly defined by unambiguous clinical definition (e.g. first-line treatment of chronic myeloid leukaemia); and
- To reliably estimate the effect of the interventions, so-called 'gold standard' evidence from studies reporting randomised trials is favoured to determine the effect of the drugs to support decision-making.

3.2.2. Example 2: a complex mixed methods review. To assess the health and well-being impacts on adults following participation in environmental enhancement and conservation activities.

- The types of intervention used in environmental enhancement and conservation activities are likely to be broad and are difficult to define;
- The population of the review is broad – any adults;
- The outcomes of health and well-being are broad and can be measured in diverse ways; and
- It is likely that multiple study designs might be used to evaluate interventions in this setting, meaning that a range of study designs might need to be identified to address the research question.

The difference between the two examples as it relates to searching is complexity. Several challenges remain to be resolved before initiating searching in example 2, which are clear from the beginning in example 1. Principally, these relate to matters of definition and scope, but they also include the challenge inherent in the topic and the types of evidence required. The absence of complexity in example 1 makes The Conventional Approach a good conceptual fit for searching: the question aligns to a search process led by searches of bibliographic databases which has a routine and linear process to identity studies. Our case study (example 2 above) illustrates why this idea of complexity is important and why The Conventional Approach is a poor fit for searching in complex systematic reviews.

In our case study, we compared The Conventional Approach to A Tailored Approach when searching for a complex systematic review. In the case study, we concluded that the time spent resolving the complexity in the research question and linking this to a novel process of searching, which reflected the available evidence, was more effective when compared with The Conventional Approach. We observed a stark difference between the number of studies identified (21,409 compared with 453) and The Conventional Approach would have led us to miss eligible studies.

Mahtani and colleagues help to identify and understand this idea of complexity with their definition of what makes a systematic review a complex systematic review (see Table 1). The components listed by Mahtani and colleagues are all evident in (or would be required to resolve) example 2 but they are superfluous for example 1. All the components identified by Mahtani and colleagues were evident in our case study and – while their definition came after our case study – they nest with the rationale for A Tailored Approach, in particular the need to resolve the challenges and identify the information needs early.

We compared Mahtani's definition to the typologies of reviews from Grant and Booth and Sutton and colleagues together with their associated methodologies to see whether certain types of review could be classified as complex, and thus might suit A Tailored Approach. Beyond acknowledging that some review types require comprehensive searches – something which can introduce complexity where the number of references identified outweigh the resources available – we concluded that it is not the type of review which introduces complexity but the topic or purpose of the review.

The models of information retrieval listed in Table 2 all carry the limitation that they do not help us understand when a review is complex and may benefit from an alternative approach to searching, partly because none reflect Mahtani's definition of a complex review and partly because the majority of the models deal with singular and discrete information

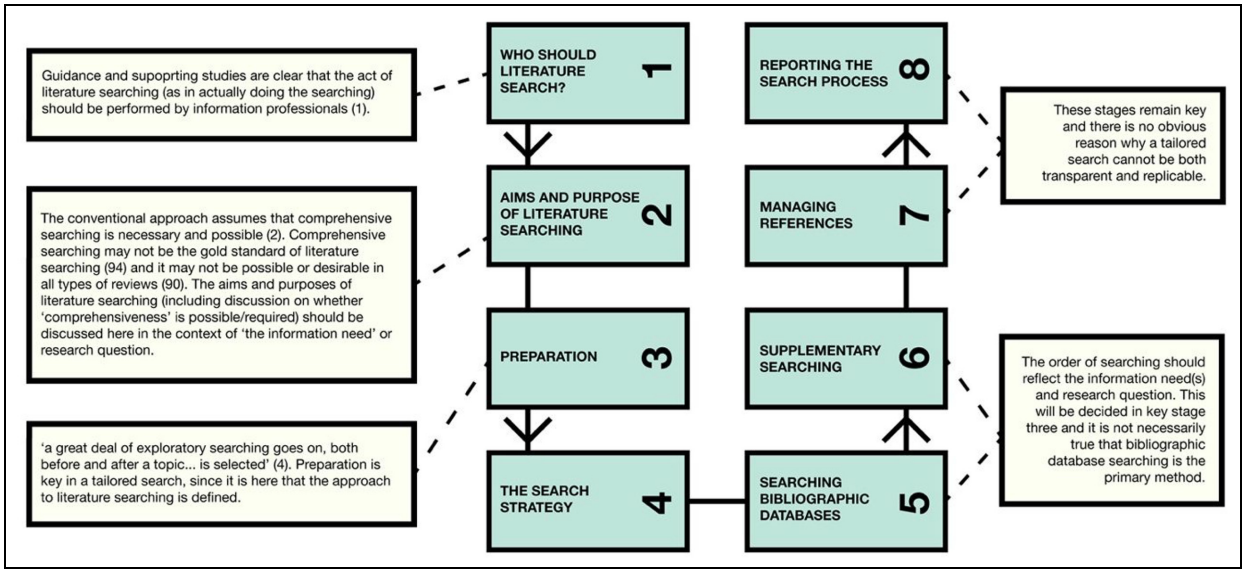

Figure 2. A critique of the Conventional Approach.

problems. In information retrieval terms, this is the comparison between the classic information retrieval model (see Figure 1) and the alternate models are represented in Table 2.

While the definition of what makes a review a complex review came after our early work in defining A Tailored Approach, we adopt the definition believing that it is the complexity that determines the need for and use of A Tailored Approach rather than the type of review.

3.3. The design of A Tailored Approach

In conceptualising the design of a new model of information retrieval, we searched for other examples [2].

First, we searched for models of information retrieval which may have been developed for – or which might explain the information retrieval process of – systematic reviews or evidence syntheses. An iterative approach to searching was used, based on citation searching from models we knew, and searching bibliographic databases such as Library, Information Science & Technology Abstracts (LISTA, EBSCOHost) to identify models we did not know [2]. None of the models identified by this search (even those in Table 2) reported an end-to-end process model with the same systematic focus, and which would achieve the same outcome in study identification, as the Conventional Approach [2].

Second, we undertook scoping searches to identify conceptual models which examined information retrieval theory or behaviour. Our search approach was the same as above. This work sought to examine how information retrieval models have been conceptualised and the theory behind and design of prominent models. We sought examples of how authors had conceptualised the scope of information retrieval problems (particularly in directing a choice between comprehensive and non-comprehensive search approaches) and how users interact with a process to make information retrieval decisions.

Table 2 presents these examples. They are compared, for similarity or dissonance, to the Conventional Approach (summarised in Figure 2 and individually in Supplemental Figures 6–14 in web-only material). This work allowed us to engage with the theory behind information retrieval, using a process model as a framework to generate new theories on how to develop a new conceptual process, in particular one which is not necessarily focused on comprehensive literature searches.

4. Challenging the existing information retrieval model

The models set out in Table 2 were selected for several reasons which we shall explore below. One thing that all the models have in common is that they represent a challenge to the classic information retrieval model in some way (see Figure 1). We see harmonies between the classic information retrieval model and The Conventional Approach.

5. Representing complexity

Like The Conventional Approach, the classic information retrieval model is linear in design, representing what Kuhlthau terms 'certainty and order' [10]. It assumes that a document exists which the user can find and that by finding the document the search query is resolved. Certainty in The Conventional Approach exists due to the primacy of bibliographic database searching (where it is assumed that the majority of studies are represented and will be identified to satisfy enquires) and order is represented by a systematic, sequential process of searching (the model is also linear, represented by consecutive steps, which are broadly speaking consistently followed to resolve searching enquires) [1,2]. Both models illustrate a search process which is linear and illustrated in simple terms [1,4].

It is unlikely that the searching process is actually this linear in either the classic information retrieval model or in The Conventional Approach. Bates' [4] model offers an alternative visualisation, based on searching in the social sciences (See online material, Supplemental Figure 11). While it is acknowledged that searching in social sciences is complicated [35,75,76], Bates [4] found, and she represents, a form of searching which uses different search methods in endless variation to resolve search enquiries. Similarly, Byström's model, and separately Du's model, also represents processes of searching which are markedly different to either the classic information retrieval model or The Conventional Approach [4,7,31]. Both models involve multiple searches, queries are discussed with colleagues, and different search methods are used.

What we perceive in these models, and specifically Bates' model, is complexity; not only the complexity of the search process but also the complexity implicit in the user's behaviour as they search. These models, though their alternate visualisations, help us see a clear challenge to linear systems which we have found in our work do not fit complex systematic reviews [2,14]. Importantly, Bates [4], Byström and Hansen [7] and Du [31] have all based their models on user experience, so their models reflect a user's needs and their behaviour as they navigate information retrieval challenges.

6. Considering user behaviour: behavioural interpretations of information retrieval

Many of the early models take a behavioural approach in analysing and explaining information retrieval problems (models 1–7 in Table 1). Taylor [11], Belkin and colleagues [5,6], and Kuhlthau [10] argue that the classic information retrieval model reflects the system and not the users' needs of the system. That is, that the systems/models do not account for human behaviour and needs in processing, addressing, and resolving search enquires. We perceive two components here:

1. Taylor, Belkin, Dervin and Bates challenge us to acknowledge and resolve complexity. They do this by highlighting the importance of (and influence in) query formulation, defining information-seeking behaviour/needs, and identifying the gap in knowledge prior to searching [4–6,11,29].
2. Bates [4] (specifically – but also Kuhlthau [10], Byström and Hansen [7], and Du [31]) argues that the classical model fails to capture the 'real life' behaviour of searchers who adapt their strategy to searching to the particular need of the moment. As above, it is unlikely that classic information retrieval or The Conventional Approach represent real-life searching practice, because current models represent a system which does not acknowledge human behaviour or 'real life'.

Incorporating an understanding of human behaviour on information retrieval systems and practice has been an influential contribution of models 1–7 when designing A Tailored Approach. These models have highlighted the importance of acknowledging, addressing, and processing the complexity in the research question(s) and aims of complex reviews, specifically in using a team-based approach to resolve uncertainty. Our case study also illustrates Bates' argument that searching in complex reviews is (almost) happing in endless variation and certainly using different search methods [14]. In short, these models demonstrate the importance of human behaviour on information retrieval processes. We consider a weakness of The Conventional Approach to be that it does not actually represent 'real life' information retrieval (as Bates might argue) and that it cannot process or deal with complexity or human behaviour.

7. Primacy of methods

We argue in The Conventional Approach that bibliographic databases have primacy given the emphasis on systematic reviews with reasonable support for this in the literature on evidence synthesis and information retrieval [1,34,77–81]. The models help us understand the challenges here, specifically as it relates to complex reviews. Taylor [11], Belkin and colleagues [5,6], and Kuhlthau's [10] work questions why we present search enquires which reflect the system not the users' needs.

The Conventional Approach prioritises searching of bibliographic databases because, in most cases, this is where most studies are identified for systematic reviews. Detailed search strategies are developed to identify studies based on how they are indexed in bibliographic databases, and we assume that the majority of time spent in searching for systematic reviews is spent on developing the search approach in and searching bibliographic databases.

As above, the primacy would not reflect behavioural interpretations nor – as we demonstrate in our case study – does the focus on one search method help us resolve complexity in information retrieval. The models help us to understand that matching search enquires to search methods might be a more suitable approach to resolving information retrieval challenges. They also encourage to look beyond the linear models as represented in the classical model and The Conventional Approach.

8. Singular and multiple pieces of information

The classic information retrieval model, and many of the early models, consider information gathering as a process which is satisfied by information in a singular form. This might reflect the origin of the models, being based on library systems where a single book might be what the user seeks, and mostly the models in Table 2 were developed prior to the online information gathering world we now know. In systematic reviews, and for evidence synthesis more broadly, the search is for studies and often – in complex reviews – different types of studies from different sources. The definition of complex reviews in Table 1 (explored above) helps us understand what is meant by complexity and the models set out in Table 2 help us understand this complexity, encouraging us to engage with it as set out above [16]. The models in Table 2 do not, however, reflect a process to resolve complex enquires in a way which reflects multiple data sources and the transparent reporting requirements often expected and associated with high-quality evidence synthesis. They represent complexity but do not help us understand how to engage with systematically.

The work summarised in Figure 2, and set out above, led to the first illustration of A Tailored Approach (see Supplemental Figure 15: web-only material). It also established seven guiding principles which, drawn from theoretical models, aligned with our tacit experience of undertaking alternative types of review and evidence synthesis. The development of the guiding principles was instrumental in the initial design and later evaluation of A Tailored Approach [14], especially given an absence of any existing models.

8.1. Seven guiding principles which informed the design of A Tailored Approach

The guiding principles are tabulated in Table 4. Each guiding principle is first expressed as a declarative statement (column one). This statement is situated alongside support for the statement (column two) in the form of 'verbatim extracts' or references taken from research studies which informed the initial development of A Tailored Approach. The source for these ideas is reported in the methods section above. This is not exhaustive but representative of how A Tailored Approach evolved. Column three of Table 4 summarises narratively where the ideas came from, why they are considered important, and how they developed. This presentation establishes an audit trail between the theories and the design of A Tailored Approach reported below. The current illustration of A Tailored Approach (Figure 3) was developed through multiple drawings and discussion based on the authors experience of undertaking complex reviews and how it related to the various drawings. It is worth noting that the authors have a background of working on various types of evidence synthesis and information retrieval problems together. This should be acknowledged, since it may influence the direction of the research [109]

9. Aim 2: to report the current conceptual illustration of A Tailored Approach and to describe a user's interaction with the process model

In this section of the article, we describe a user's interaction with A Tailored Approach. The current version of A Tailored Approach is shown in Figure 3. The process is sequential in design. The completion of one stage leads to the start of the next stage and the interaction with the 10 stages of A Tailored Approach should result in a completed and systematic literature search. Table 5 is structured to describe a user's interaction with the process model in Figure 3. It reads from left to right to describe:

- The action undertaken by a user at each stage of the process;
- The purpose of each stage;
- Anticipated outputs by stage; and
- Supporting notes for each stage of A Tailored Approach.

Table 3. Brief summary of previous work to support A Tailored Approach.

Study	Article's aim(s)	Findings	Contribution to the current article
Cooper et al. [1]	We aimed to determine whether a shared model of the literature searching process could be detected across systematic review guidance documents and, if so, how this process is reported in the guidance and supported by published studies.	We identified a common approach made up of eight key stages which we named The Conventional Approach (see Supplemental Figure 5, web-only material, for the illustration of the model). The eight stages were: 1. who should literature search; 2. aims and purpose of literature searching; 3. preparation; 4. the search strategy; 5. searching databases; 6. supplementary searching; 7. managing references; and 8. reporting the search process. This article was the first to establish and illustrate that leading guidance documents advocated the same process to literature searching in systematic reviews, irrespective to the type of systematic review or study data sort.	The identification and illustration of The Conventional Approach lead us to design A Tailored Approach. This is because we questioned if the search approach should change as the needs of the review or evidence synthesis changed, and if the search approach should reflect the studies and evidence base available. We explore this in greater detail in section 1.1 of this article.
Cooper et al. [17]	The aim of this study was to identify and summarise evidence on supplementary search methods. From this review, we aimed to develop a 'literature search toolbox' of data to inform decision-making on when or how to use supplementary search methods and the resources implications (time/cost).	Five supplementary search methods were reviewed: 1. contacting study authors; 2. citation chasing; 3. handsearching; 4. searching trial registers; and 5. web searching. Data were summarised by method to the following sub-headings: • What it [the method] is used for; • What the evidence says; • Claimed advantages; • Claimed disadvantages; and • Resource requirements.	This review aims to feed into Stage 6 of the current draft of A Tailored Approach (see Figure 3), where a searcher selects which search methods to use (and which to discard) when designing A Tailored Approach. For example, with data on advantages/disadvantages of a method, and resource use, we envisaged that a searcher might reach evidence-informed decisions about when or how to deploy a search method relative to the aim of the review or data needs.

(continued)

Journal of Information Science, 2022, pp. 1–33 © The Author(s), DOI: 10.1177/01655515221114452

Table 3. (continued)

Study	Article's aim(s)	Findings	Contribution to the current article
Cooper et al. [14]	A case study to assess the effectiveness and value of: (1) a search approach led by supplementary search methods (A Tailored Approach); compared with (2) a search approach led by bibliographic databases (A Conventional Approach).	The effects of re-ordering a search approach from A Conventional Approach led by comprehensive searches of bibliographic databases to A Tailored Approach which prioritised supplementary search methods are: • Differences in the number of studies to screen by each approach (21,409 in The Conventional approach compared with 453 in A Tailored Approach) • Differences in the number of studies eligible for inclusion identified by each approach (two studies were identified uniquely using A Conventional Approach and nine studies were unique to A Tailored Approach (10 studies were identified by both approaches)); and • Differences in the contribution of studies identified by each approach to the synthesis. We found that the two studies identified uniquely in A Conventional Approach made minimal contributions to the synthesis whereas the nine studies unique to A Tailored Approach made significant contributions to the synthesis.	This case study was the first test of A Tailored Approach, based on an early illustration of the model (see Supplemental Figure 15, web-only material) and ideas on how search methods might be selected and aligned using the review of supplementary search methods. The study also confirmed the idea of the team-based approach to study identification led by the searcher. This study demonstrated the potential for using A Tailored Approach compared with A Conventional Approach. In addition, this study was unique in its reanalysis of the searches and contribution of studies to the synthesis as a way to interpret the value of different search approaches. This article helped shape the current draft of A Tailored Approach, in particular the 'possible combinations graphic' in Figure 3.

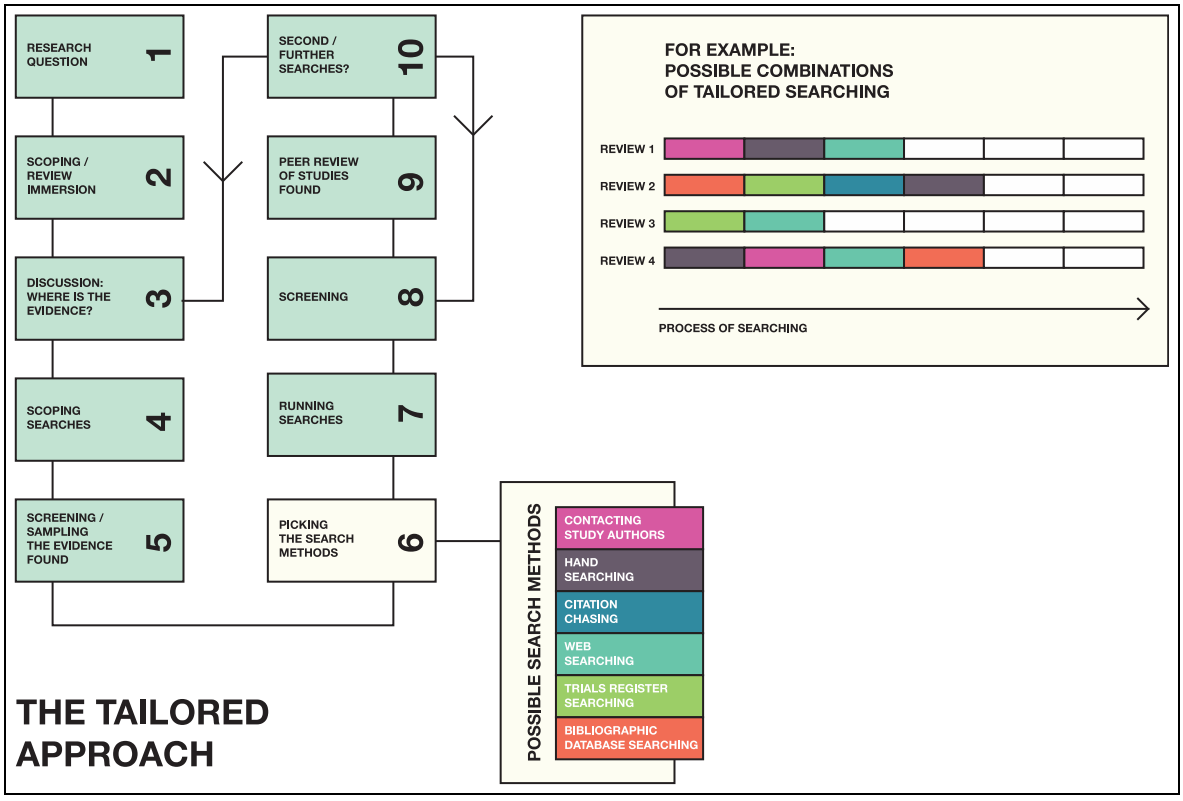

Figure 3. The current draft of the Tailored Approach [2].

A Tailored Approach assumes an experienced research team made up of: an information specialist, researchers capable of undertaking a systematic review or evidence synthesis, and researchers skilled in the type of analysis planned, be that quantitative or qualitative. Ideally the research team is supported by experts in the topic of review and, in some cases, the end-user such as commissioners and policy makers [87].

10. Aim 3: to situate the elements novel to A Tailored Approach (when compared with a Conventional Approach) in the relevant literature to explore the implications of this model for researchers

We have set out the rationale for, and theory behind, the design of A Tailored Approach (aim 1), and we have reported the current illustration of the conceptual model and described a user's interaction with it (aim 2). Below, we situate the stages of A Tailored Approach which are either novel or germane to our experience of following the approach, when compared with the Conventional approach (aim 3). This aim is supported by Figure 4 which reports a visual comparison of the two approaches. The aim of this section of the article is to situate A Tailored Approach in context and to explore the implications of A Tailored Approach as well as stimulating discussion on areas of searching practice which might be developed in reporting or future studies.

10.1. Key stage 2. Scoping/review immersion: a good time for a measured pace?

Little explicit methodological guidance or evidence exists on how to effectively undertake scoping searches for systematic reviews using the Conventional Approach [1,113,114]. The lack of guidance is potentially unhelpful for those undertaking scoping for the first time but the lack of the empirical evidence evaluating methods and approaches may be apposite [113,115].

Scoping is necessarily an uncertain stage which is best developed iteratively [27,112]. Armstrong et al. [85] encourage researchers to consider scoping as an opportunity to collect and organise important background information, which implies a measured pace of work that is critical to A Tailored Approach. Further guidance could usefully specify

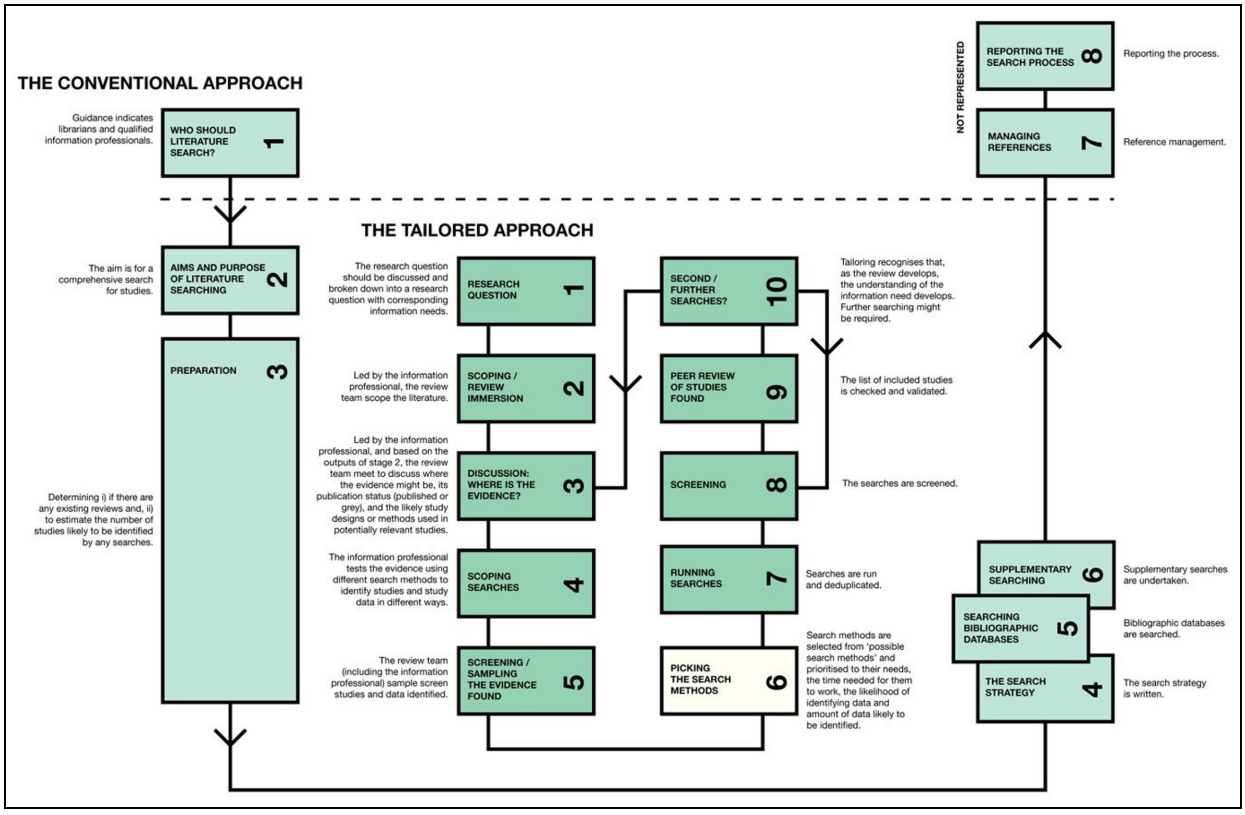

Figure 4. Comparison between The Conventional Approach and A Tailored Approach.

approximately how much time to invest in scoping and how to allocate this time between scoping tasks [2,17]. A previous edition of NICE [134] guidance for the development of public health guidelines (2013) indicated that 1 month was a suitable amount of time to prepare for and undertake literature searches for public health topics. There was no detail on how this time should be allocated or used, or from where this time estimate originated [2]. The implication was that the tacit experience of the research team/stakeholders, and the topic, would guide the work and this was our experience in the supporting case study [14,28]. We suggest two key messages of stage 2, and for alternative/complex reviews generally: (1) follow a measured pace rather than to rush into finalising searching as quickly as possible, and (2) document the scoping searches, perhaps by using a search narrative, to keep track of the development of the search [28,130,131,135].

10.2. Key stage 3. Discussion: where is the evidence? Developing the role of the team

Theoretical models (see Table 2) offer good support for the role of a team as opposed to an individual to reduce the anomaly of knowledge and develop understandings of information needs. However, limited empirical work demonstrates the role of team-based decision making in systematic or complex reviews and in the Conventional Approach [92,136–138].

In the absence of this empirical work, researchers need to intuitively evolve their own working patterns. This was our experience in the supporting case study [14,139]. The research team worked closely with Cochrane and an expert advisory group convened to help support the project [116,140]. The advisory group were consulted to identify studies (in particular unpublished studies or reports), identify organisations or contacts to help identify studies or reports, and comment on potential search terms [113,116,141]. The latter also involved commenting on the context or how the terminology used to describe interventions had changed over time. The advisory group was an important part of our case study and involving experts is recognised in the literature [87,88,116,142]; having formed the basis of guideline development for many years.

One challenge of team-based approaches is to ensure that the collaboration is genuinely inclusive [136]. This relates to the composition of the group and how they might contribute to reviews [88]. This may involve discussion at the start

of the project on roles and responsibilities and how people who contribute to, but do not work full-time on, the review can maintain involvement while working on other projects (e.g. information specialists, statisticians, topic experts) [136,143]. This way of working undoubtedly requires further discussion to understand the benefits [136,137] and possible risks [138]. How to fund such resource and ensure that it is available when needed is also an important consideration.

10.3. Key stage 6: selecting search methods

The selection and prioritisation of search methods in A Tailored Approach challenges the prevailing orthodoxy of literature searching as defined in the Conventional Approach and described in best practice guidance. Using search methods in a different order than is presently conventional practice, and the possibility of not using some search methods, initially represents an alarming proposition, raising associated concerns about potential bias.

Where the Conventional Approach seeks to guard against the introduction of bias though a comprehensive search for studies, A Tailored Approach is more objective being defined by the experience of the research team. It is perceptibly a comparison between 'doing everything' by using all search methods in a defined, predominantly linear, order (the Conventional Approach) and fitting the order of search methods and the extent to which they are used (or not used) to the research objectives and studies (A Tailored Approach). Accordingly, A Tailored Approach must defend against unintended bias, steps for which are set out below. It should be acknowledged that neither the Conventional Approach nor A Tailored Approach entirely removes the possibility of bias in study identification. The article reporting The Conventional Approach explores some of the gaps in guidance and the issues that this may create [1].

10.4. Greater diligence in reporting the pre-work

Due to the increased choice-making by the research team, and the possibility of producing a biased sample of studies, A Tailored Approach calls for greater diligence in reporting the conceptual and contextual development of the search approach. Kuhlthau's [10] model suggests that significant exploratory searching occurs before the search enquiry is formed. The same is true of literature searching for systematic reviews: readers only encounter the final and completed search strategy in the protocol or review appendices and often without any guidance on how or why this approach was chosen over any alternative approach or any associated limitations with the approach [130,131]. This not only betrays the amount of work involved in developing searches but also prohibits a clear understanding of the search approach and studies identified.

A Tailored Approach seeks to acknowledge this 'pre-work' (illustrated as stages 1–5 in Figure 3) in the belief that, even if only a brief account is recorded in appendices, this detail can guide the reader to understand the strengths and limitations of the literature search. This does not prevent bias (any more than using every search method removes bias from study identification in the Conventional Approach) but it seeks to acknowledge decisions which might introduce bias and their associated limitations. Our experience using A Tailored Approach is to rationalise and explain the approach to literature searching while situating it within the quality and experience of the research team. It is possible, and indeed desirable, to illustrate a priori the approach to literature searching in a study protocol. Any deviation from this pre-specified approach (for example follow-up searches at stage 10) can be addressed by a post hoc annotation of the differences between protocol and review.

10.5. Re-orientating the idea of the primary and supplementary search methods

In the Conventional Approach, bibliographic database searching is consistently identified as the primary search method [1]. A Tailored Approach disputes the notion of a primary search method, instead searching is tailored to information needs, so that any of the methods set out in stage 6 – including bibliographic searching – could be primary and where the greatest amount of resource is invested to identify studies. Supplementary search methods make an important contribution to searching in systematic reviews. This finding has been consistently reported since approximately 1993 [36]. Occasional studies updating this finding [35,144,145] either focus on individual supplementary search methods (e.g. handsearching [146]), citation chasing [147,148], or contacting study authors [149]. The selection of search methods, and the potential for not using some search methods, is recognised but has not yet been examined as part of a composite model to searching in systematic reviews [1,2,66,77,80,81,150–156]. This may be because the evidence for supplementary search methods varies and their validity as effective and efficient search methods is unclear when compared with bibliographic database searching (see implications for further research) [4].

Further work may revisit the suggestion to omit certain search methods where this is considered too radical. An approach that determines the available time for searching and then allocates specific time limits to specific search

methods may be more suitable [2,17,77,157,158]. This approach may give more time to web-searching and author contact and less time to bibliographic searching and citation searching in circumstances where the former methods are considered more likely to identify studies than the latter [14,79]. This example was the finding of our case study and it arose through an a priori concern that a focus on bibliographic database searching might have squandered resources where we did not anticipate identifying studies leaving no resource for non-database search methods where we did anticipate finding studies. It seeks to challenge the presumptive belief in the Conventional Approach that bibliographic database searching is where the majority of search resource should be invested since published studies are the foci of the search [2,77]. While this may be true for review of clinical interventions, it does not hold for other types of review or synthesis and it requires further examination [77]. Guidance on searching for Realist Reviews (or evaluation) contributes here too [100,101]. In A Tailored Approach, searches should be driven by the information needs, not necessarily by the hierarchy of evidence [88]. Again, it is worth spending time thinking what data are needed, where these might be reported, and how will these best be identified, rather than focusing on a particular study design [88,100].

10.6. Retaining systematic approaches and transparent reporting

The selection and order of search methods varies by review in A Tailored Approach. This makes it more challenging to provide clear generic guidance on how to undertake A Tailored Approach. It, however, offers the flexibility for the review team to decide on the order of sources and to clearly report the rationale for this decision including any limitations arising from the approach in the final review. A Tailored Approach is equally suited to be defined in a protocol and then reported according to the guidance of choice. Clearly, A Tailored Approach should be reported to the same standard and should follow the same reporting guidance as conventional systematic reviews or other forms of complex searching such as for Realist Review [37,159–161].

10.7. Limitations

Neither A Tailored Approach nor Conventional Approach can anticipate the complexity inherent in complex reviews. The resulting success of any Tailored Approach is relative to the users' knowledge of the problem that they explore and the review teams experience [8,9]. A review team must be sufficiently comfortable with and confident in the standard methodological approaches recommend in guidance to fit A Tailored Approach to the review and data.

The work reported here is mostly situated in theory and has only been examined empirically in one published case study [14]. Further evaluations of the same study may find different results and we do not suggest that A Tailored Approach could generalise as a perfect solution for use in complex reviews.

The nature of the comparison between A Tailored Approach and the Conventional Approach reported here and elsewhere is illustrative. The purpose of the comparison in this article was to examine one potential alternative model; to describe it, to illustrate it, and to report a users' interaction with it. In practice, the comparison we make here is unlikely to be this simple. First, in theory, A Tailored Approach as described above could be made up of multiple different iterations, meaning many possible comparisons to the Conventional Approach. Second, the extent to which the Conventional Approach is followed as a linear process is unclear, making comparisons between approaches hard to systematically analyse. While the article is principally a descriptive report, we situate these issues here as a potential limitation of this article.

10.8. Implications for further research

Bates notes (in 1993) that some methods proposed in her model are not yet accepted as valid or effective approaches to information retrieval. This view remains largely valid now (almost 30 years later) for systematic reviews. There is no clear and empirical evidence for privileging, for example, web-searching in systematic reviews over bibliographic database searching, but the unrivalled coverage of the Internet offers a sufficient rationale for its inclusion as a search approach [154,162–164]. Further comparative evidence is needed to explore non-database search methods if Tailored or other approaches are to be developed, setting out clearly the effectiveness, the efficiencies and value of search methods are a clear target for further research.

Certain nuances in approaches to literature searching may be held in the tacit experience of information specialists or research teams and not reported in practice [2]. Elements of what we describe may be common-practice in some researcher teams. Reporting guidelines, word limits, perhaps a misunderstanding as to the importance of reporting the process of literature searching in full, appear to restrict a full report of the search process which inhibits an

Table 4. Seven guiding principles behind A Tailored Approach.

The guiding principle for A Tailored Approach	Support for the principle: extracts or findings taken from articles reporting theoretical models or research studies.	Narrative summary of support
1. Defining the information need is vital but complicated work	What is the information need? Kuhlthau [10]: 'The gap between the users' knowledge about the problem or topic and what the user needs to know to solve the problem'. Problems defining the information need Chang [82]: 'Information needs may be unconscious and inexpressible'. Taylor [11]: 'One person tries to describe for another person not something he knows but rather something he does not know'.	The first task in A Tailored Approach is to define the information need: broadly, in plain English, what are we searching for? The quotes not only illustrate the importance of the task but also the complexity in reaching a definition. It is, furthermore, possible that some research questions have multiple information needs, which may not be evident from the research question. Denyer and Tranfield [83] refer to the formulation of specific questions as 'lines of inquiry'. That is, what do we want to know. This may be a helpful framing exercise at this stage. All information needs need to be defined and understood by all members of the research team [84]. This links to guiding principle 2.
2. Therefore, a team of people (and possibly substantial time) is needed to define the information need(s)	Who is best placed to define the information needs and decide what is being searched for? Kuhlthau [10]: 'We come from different histories and our observations today rest, at least in part, on our pasts'; Dervin [29]: 'The criteria for making these choices [from identifying an information need to resolving the it] are influenced as much by environmental constraints, such as prior experience, knowledge, and interest, information available, requirements of the problem, and time allotted for resolution, as by the relevancy of the content of the information retrieved'; and Belkin [5] 'The ASK [anomalous state of knowledge] hypothesis is that an information need arises from a recognised anomaly in the user's state of knowledge concerning some topic or situation and that, in general, the user is unable to specify precisely what is needed to resolve that anomaly. Thus, for the purposes of IR, it is more suitable to attempt to describe that ASK, than to ask the user to specify her/his need as a request to the system'.	A Tailored Approach suggests that defining the information need should be a team activity on which as much time as possible is spent in the conception stage of a complex review or synthesis [2,85,86]. The theoretical models guide the rationale for this team-based approach as indicated in the supporting quotes. A team has a greater collective history (viz. Dervin and Kuhlthau) and the people making up the team can work together to reduce the uncertainty in the anomaly of knowledge (viz. Belkin) [2,5,6,10,29]. While information professionals are well placed to undertake literature searching (as a process), conceptualising more broadly 'who should literature search,' to mean who decides what we are searching for and how this should be done, a team-based, problem-solving approach may reduce the 'anomaly' in knowledge through the team's collective and 'different histories.' The team may include funders, commissioners, policy makers and stakeholders for this reason [87]. The success of this approach depends, in part, on the composition of the group and how they contribute to reviews [88]. A constant dialogue between the team is needed [27].

(continued)

Table 4. (continued)

The guiding principle for A Tailored Approach	Support for the principle: extracts or findings taken from articles reporting theoretical models or research studies.	Narrative summary of support
3. Information needs (not necessarily research questions) should determine the process of information retrieval	How to search: should we search differently for information needs and in complex reviews? Developing an understanding of the 'information need' determines how a user accesses a system of information retrieval [13].	Belkin – specifically – Wilson and Taylor argue that the process of information retrieval (literature searching, in our case) should be matched to the information need and where the information is [5,11,12,89]. This would suggest that different information needs may require different literature searching solutions and that search methods should be selected and prioritised according to the information needs. The word 'process' in the theoretical models in not entirely clear. In A Tailored Approach, process means 'how will we search.' This means not only the order of search methods but also supporting description on any search methods which will be prioritised (and why) and those search methods which might be omitted (and why). It is unclear whether the process, or use of methods, should change by review [4]. This might be explained by the lack of an agreed method or systematic approach which is clear in the Conventional Approach.
4. Search methods should be selected and prioritised according to the information needs	'Different retrieval strategies may be necessary' for different kinds of information needs [5,6].	While Belkin and colleagues [5,6], Wilson [12,13] and Taylor [11] suggest that the process of information retrieval (literature searching) should match information needs, they do not advocate strategies to determine how this should be achieved. Information retrieval is represented as a 'black box' function in their models (Belkin Supplemental Figure 7, Wilson Supplemental Figure 8, and Taylor Supplemental Figure 6). Ellis and, separately, Bates provide greater detail on the use of search methods in their models (Ellis Supplemental Figure 10 and Bates Supplemental Figure 11). No particular guidance exists on how to match literature search methods to information needs or information retrieval task [2,4,8,9]. So how should search methods be linked to information needs?
5. The information specialist is cast as the decision-maker	The theoretical models do not offer guidance on who should conduct the literature search but the guidance documents and studies supporting the design of the Conventional Approach are clear: Cooper [18]: 'people with relevant expertise of literature searching should 'ideally' be included within the review team. Information specialists (or information scientists), librarians or trial search co-ordinators (TSCs) are indicated as appropriate researchers' [1,19,22,23,25–27]. Bates [4]: 'the searcher with the widest range of search strategies available is the searcher with the greatest retrieval power'.	Defining the role and work of the information specialist has been the focus of empirical research studies [90,91] and other articles [92–98]. A Tailored Approach suggests a role for the information specialist as 'decision-maker' [2]. While the research team work together with the information specialist to define the information needs (stages 1–4 above), the information specialist – using their specialist training and tacit experience in literature searching and search strategies/ methods – would seek to associate (where possible) search methods with information needs. The aim here is to address the needs of the systematic review or evidence synthesis by linking search methods to information needs and studies or data. This addresses stages 3 and 4 above.

(continued)

Table 4. (continued)

The guiding principle for A Tailored Approach	Support for the principle: extracts or findings taken from articles reporting theoretical models or research studies.	Narrative summary of support
6. Comprehensive literature searching is not necessarily the aim of A Tailored Approach	The following work guided us: Lorenc et al. [99] 'Our findings thus support the view that comprehensiveness is in many cases not an attainable goal for SRs [systematic reviews] of qualitative evidence, particularly in the context of evaluating effectiveness. This is probably not as serious a limitation as it seems, because...comprehensiveness may not be a desirable goal for such reviews either'. One method is to base inclusion on the principle of saturation such that, rather than including all studies meeting the criteria, a selection is made (based on the perceived value of the primary studies, or on a priori theoretical grounds), and inclusion extended to new studies up to the point where they no longer add to the content of the synthesis. While this idea might initially seem located in qualitative evidence synthesis [67], it is an idea to explore in other types of review of mixed methods synthesis too.	A key difference between a Conventional Approach and A Tailored Approach is that comprehensive identification of studies is not necessarily the aim of A Tailored Approach. This is similar to other types of review such as qualitative evidence synthesis or Realist Review [100–102]. The theoretical models principally deal with the information retrieval needs of an individual or research team to address a single information need. This is often through the identification of one source of information which ostensibly deals with the gap in knowledge and resolves the information problem and enquiry. The models mostly pre-date the advent of systematic reviews (est. 1993 with the emergence of The Cochrane Collaboration's detailed process and guidance) [45,46,103]. The processes that the theoretical models report do not account for numerous information needs or multiple sources of data which might all contribute to address a research question. The nature of complex reviews is that the searches are often broad in scope (to not miss relevant information, based on the belief that comprehensive searches are gold standard and necessary) and they offer low precision (because much of the information identified is not relevant) [1,2,104,105]. While the requirement for comprehensive literature searches is demonstrated (or more simply expected) in some evidence synthesis products, the justification for this style of comprehensive searching in other types of literature searching is unclear [66,67,71,99,105–107]. The issue that A Tailored Approach seeks to resolve is how to identify some information, which will address the needs of researchers without identifying all of the information which might be returned, and which could overwhelm the research team.
7. And second thoughts are acceptable	Kuhlthau [10] 'What is relevant at the beginning of a search may not be at the close'. Bates 'Real searches...use all...techniques and more, in endless variation'	The Conventional Approach relies on comprehensive literature searches which are developed and run at the start of the review. For well-defined decision problems, with clear interventions, comparators and outcomes, this may be suitable. The anomaly of knowledge is unlikely to change between the start of the review and completion. For complex reviews, the research team develop their knowledge of what is relevant by undertaking the review – and know more about the topic at the end than the beginning. Elements key to the synthesis may be identified throughout the review, and new ideas or new understandings emerge, making it necessary to re-search during or at the end of the review. A Tailored Approach acknowledges that follow-up searches are commonly required. Follow-up searching is not considered a weakness to the overall search approach, indeed if notes are retained on the rationale for further searching, these may be useful to future researchers [108].

ASK: anomalous state of knowledge.

Table 5. Description of how users interact with A Tailored Approach.

Stage	Action	Purpose	Outputs	Notes
1. Research question	The proposed research question(s) is discussed by the research team, ideally before the research question is firmly agreed [22].	To generate a shared understanding of the topic, the aims of the review, and to break the research question(s) down to identify the information need or needs [110]. All members of the research team (and wider stakeholders) should join in this discussion.	The output of this stage is an agreed research question which is associated with a clear list of information needs [110]. These information needs will be used to guide scoping searches in stage 2 below.	Discussion is to be encouraged. The Campbell Handbook suggests a 'constant dialogue' within the review team [27]. Minutes from this meeting might be a helpful aide memoir later. It can be helpful to circulate relevant studies and summarise why these studies or data might be relevant and why other studies or data might not be. Simple logic models might be useful to visually link the research question to the information need and the information need to possible data [111]. Depending on the type of review, and resources available, involvement of an expert advisory group or topic/methods experts would be advantageous [14,87]. As indicated above, the composition of the group and how they might contribute to the review should be discussed [88].
2. Scoping/review immersion	Led by the information specialist, the review team scope the literature.	The purpose of this stage is not to undertake systematic searches or to identify all the relevant studies. It is a broadly reconnaissance ("sensitisation" or getting a "fell" for the literature) [93,102] and topic immersion: the aim is to 'gather knowledge' on the topic to inform subsequent discussion with the research team at stage 3 [112]. Searches are undertaken by all members of the research team. The purpose here is not to write the search strategy but to think about how it might work or look.	The output of this stage will be the identification of some potentially relevant studies or data as well as the development of preliminary topic knowledge in the review team. The studies/data and findings of this stage will be discussed at stage 3. The information specialist will conduct scoping to determine the anticipated number of studies to sift. Scoping searches can also seek to identify, or be used to clarify, issues arising around core definitions [85,113–119]. This knowledge can help tailor the search approach to the research resources available.	The brief in A Tailored Approach is to 'follow a measured pace' rather than 'rush in' and the purpose of this stage is defined by scoping and reading followed by further scoping and reading. This stage might take about 2 weeks. Detailed notes are retained on search terms used and search terms tested but not adopted (and why). Furthermore, the availability of studies and publication status, types of study by design, and search methods used to locate studies/data should be recoded [88,119,120]. It is useful to test the suitability of different approaches to the literature search at this stage (e.g. objective or subjective approaches [14,121–123], to give the research team options [124]. Any issues noted in scoping – for example if a significant number of studies undertaken on animals are returned which could be removed from the search at the searching stage – should also be noted for discussion.

(continued)

Table 5. (continued)

Stage	Action	Purpose	Outputs	Notes
3. Discussion: where is the evidence?	Led by the information professional, and based on the outputs of stage 2, the review team meet to discuss where the evidence might be, its publication status (published or grey), and the likely study designs or methods used in potentially relevant studies. This is where the information professional takes the role as decision-maker, organising feedback and taking decisions on how to process the scoping searches.	The purpose of this meeting is to further explore stage 1 and gather iterative feedback on stage 2.	The information needs and studies or data identified to date are continually discussed and refined now, leading to an increasingly clearer sense of what the searches should locate and how this might be achieved (using which search methods) [2,4,125]. The output of this stage is a clear(er) sense of the information needs and the types of studies and study data which the searches should identity. This informs how studies might relate to addressing the research question.	It is important that all members of the research team attend this meeting. Discussions could, for instance, focus on the number of eligible studies reported using a randomised trial design, suggesting the limited value of including studies evaluated using observational designs for the review in question. Similarly, discussions might focus on the number of unpublished reports, or the work undertaken by named key researchers. Identifying key researchers can help the team to engage with the review's evidence base. The research question(s) and information need(s) may need to be revised at this stage.
4. Scoping searches	The information professional tests the evidence base for the review using different search methods to identify studies and study data in different ways (i.e. scoping searches of bibliographic databases or web searching).	The purpose of this stage is to develop a sample of potentially relevant studies from different search methods. This is informed by studies already identified in stages 2 and 3. It is likely that searching will be iterative (possibly experimental) and not systematic at this stage since a broad range of sources will be useful at stage 5 [4,88,102,106,126,127]. Studies where relevancy is unclear, or studies identified by the scoping searches but which are not relevant, should also be retained since they can inform discussion and help the review centre on the studies of relevance.	The output of this stage is a sample of studies for the research team for screening at stage 5. This sample of studies should be clearly derived so that the eligible studies can be clearly separated from the ineligible studies. Studies confirmed as eligible become marker papers generally and, specifically, for the search method in question, in order to establish that they are always retrieved.	The information professional is now in the advanced stage of developing a search strategy and an approach to literature searching. They use different search methods (i.e. databases, web-searching, citation chasing relevant studies) to identify potentially relevant studies from a range of options (published studies, reports, conference proceedings) [124]. Note-taking and record keeping continue to be important at this stage since decisions are now being made which will impact the final design of the search approach.
5. Screening/sampling the evidence found	The review team (including the information professional) sample screen studies and data identified at stage 4. This helps refine screening criteria and informs the team's understanding of what does (and what does not) fulfil inclusion.	The purpose is to explore the output of the scoping searches and to begin to identify potentially relevant studies/data and associate them with literature search methods. The sampling process should also include developing definitions of key terms, which is particularly important for complex interventions, where a lack of standardised language is often present [2,104].	The output is a list of potentially eligible studies which are clearly associated with search methods. This shows which search methods are contributing studies/data and which are not. A second output is hopefully a clearer sense of relevant studies and representation of the information needs for all the research team.	This stage permits piloting of the review's inclusion/exclusion criteria and relevant studies can be used to pilot data-extraction tables too. This can also inform estimates of the time needed to process studies when the searches are run. Discussion about the studies as they are screened can be interesting to follow. Capturing this discussion on instant messenger or chat function may help refine inclusion criteria and develop the search process. Accordingly, this stage should ideally be followed by another research team meeting to discuss and explore the findings in screening.

(continued)

Table 5. (continued)

Stage	Action	Purpose	Outputs	Notes
6. Picking the search methods	Search methods are selected for literature searching from the possible search methods box in Figure 3. The chosen search methods are prioritised as to their information needs, the time needed for them to work, the likelihood of identifying data, and amount of data likely to be identified which will need to be processed.	The purpose of this stage is in two parts. 6.1: Deciding which search methods to use Using the set of eligible marker studies identified above, the information professional selects the search methods which will be used from the literature search tool-box illustrated in Figure 3 [2,128,129]. The information professional selects those search methods which have already identified eligible marker studies from the stages above (because of empirical evidence that they work and will probably work when taken to scale in the review) and they 'may' discard those search methods which have not identified studies to date, or not identified any unique studies when compared with other methods. 6.2: Deciding the order of the search methods The next decision is in what order to apply the search methods [78]. This is in contrast to the Conventional Approach which starts with database searching followed by other search methods. Determining the order of search methods is situated in the knowledge that: • Search methods employ different mechanisms of action. Some are data producers and others are data responders. Data producers, such as database searching or trials registry searching, supply data in response to a user prompt. Data responders, citation chasing or author contact, need initial data from which further data are identified. While data producers can be used at any stage, data responders need data to begin with, if they are to be used. A Tailored Approach generates these data through scoping searches and discussion. As illustrated elsewhere, this approach starts with author contact and citation chasing rather than database searching [14]. • Some search methods take longer to implement and to yield a result than others. For instance, it may take a day to search bibliographic databases whereas contacting study authors may take approximately 21 days between data request and data provision [14,129]. If contacting study authors is deemed important, it may be worthwhile to prioritise this method over other methods, so that the search is 'active' while the focus shifts to other search methods. This allows for yield from all search methods.	The aim here is to identify which search methods will be used and produce a sequence of literature searching tailored to the information needs and resources available as a tangible output. This should be reported in the protocol for the review and agreed upon by the research team. Possible combinations of tailored search approaches are indicated in the graphic in Figure 3. This illustrating that every Tailored Approach should be different on a search-by-search basis.	The research team will now have a clear draft protocol for the methods of review and a clear set of eligible marker studies has been identified. It is clear to the information professional how and why these studies were identified and by which search methods [129]. To inform choice-making at this stage, we reported a review of supplementary search methods [17]. This review reports the guidance available for, and empirical examinations of, the strengths, weakness and resource requirements of supplementary search methods. This review can be read alongside deciding which search methods to use from Figure 3. At this stage, the section of the protocol relating to literature searching can be finalised.
7. Running searches	Having selected the search methods, and determined the order of searching, the literature searches are performed.	The purpose of this stage is to identify studies or data for review. This stage is part of the Conventional Approach from which guidance can be sought [1].	The output is the identification of studies to screen for the review or synthesis.	Search narratives offer a useful aide-mémoire for conceptual or contextual decisions made when literature searching. These narratives provide detail necessary to understand the development of the searches and decisions made while running the searches [130–133].

(continued)

Table 5. (continued)

Stage	Action	Purpose	Outputs	Notes
8. Screening	Studies identified are screened for relevancy.	The purpose of this stage is to identify studies or data for review. This stage is part of the Conventional Approach from which guidance can be sought [133].	The output is a list of studies fulfilling inclusion for the review.	
9. Peer review of studies found	The list of studies fulfilling inclusion is checked and validated for omission of any relevant studies by stakeholders external to the review.	The purpose of this stage is to ensure any obvious or relevant studies have not been accidently over-looked. If any have been, this should be investigated. The importance of any new studies should be determined and action taken to incorporate them accordingly.	Outputs vary depending on the review purpose or resources available. If no studies have been over-looked or excluded, this gives confidence to the researchers. Alternatively, new studies might be proposed, and these will need to reviewed. This stage can also be used to explore questions arising from the knowledge gained in screening studies or apparent gaps arising in study identification.	This stage may also serve to test for theoretical saturation of the potentially available literature and offer confidence to the review team and stakeholders that the synthesis that follows is based on a reliable sample of studies and data. The Cochrane Handbook [22], for instance, recommends that Cochrane reviews set out a website to manage dissemination of the review and to share and exponentially increase the opportunity for people to review the list of included studies. Combining the existence of the web-page with power of Twitter and social media could broaden the pool of potential commentators. This needs to be balanced against the risk of overwhelming the research team.
10. Follow-up searches	If required, follow-up searching is conducted. This work will likely happen in parallel with the first draft of the review.	A Tailored Approach acknowledges that the research team knows the least about the topic and relevant studies at the start of the review compared with the end of the process and reporting their findings. Follow-up searches could be used to attend to new knowledge identified during the process of review, to process the identification of studies identified in peer review (stage 9), or simply to test new ideas, theories, or the studies identified by the review, for further relevancy.	The output might be new studies. These new studies offer the opportunity for reiteration through the process starting at stage 8.	Searches should be planned and conducted systematically and reported transparently. Ideally, searches are reported separately from the main searches to make clear how and why they were identified. These follow-up searches are not perceived as a weakness to the literature searching unless new studies arise because of error in the stages above. Rather, they add additional/important/significant context to the phenomena of interest. It may also be necessary to cycle-back through stages of the model since alternative review types are rarely linear and movement between stages is typically required depending on the results identified [4].

understanding of day-to-day practice [130]. We call for greater guidance on this and for the availability of fuller reports which would also help guide further research priorities in literature searching for complex reviews.

For complex reviews, it is helpful to indicate the time taken for review-specific tasks, perhaps by sharing a review Gantt chart which sets out proposed and actual timing in an annex of the review [17]. This detail could help future researchers in planning and budgeting research time [143].

While we have not identified any other conceptual models of searching process which could be used in systematic reviews, we acknowledge the emergence of other 'styles' of searching which are developing frameworks and questioning the methodological process of study or data identification [15,66,67,99,102,106,165]. Based on the work of Pawson [93], Booth et al. [102,165] have proposed a six-stage framework to guide a Realist search. Similarly, searching for qualitative evidence synthesis is more confidently moving to a searching approach based on sampling as opposed to exhaustiveness (as is used in reviews of effectiveness) [67,99]. This progress is welcomed as researchers look for guidance and as they respond to the challenge of searching an evidence base which grows daily [165].

In acknowledging these approaches, it highlights a subtle difference in the approach to resolving information retrieval enquires, which we explore in this article and the article reporting The Conventional Approach [1]. That is the difference between researchers who pursue information retrieval research using theoretical models and test data sets (compare the models reported in Table 2) and the researchers who examine practical, work-based retrieval problems, which are in the minority [2]. We hope that our work here makes a case for further harmonies between the theoretical visualisation and practical exploration of retrieval problems [2]. An area for further such research would seem to be on developing approaches which incorporate 'stopping rules'. That is the development, testing, and evaluation on when to stop searching, for instance, where a researcher has sufficient information to address their research query. This is a challenge facing systematic reviews which has not yet been resolved [15,66,164].

11. Conclusions

This article sets out the rationale for and design of a new information retrieval model for use in complex systematic reviews. Supported by description of its development, and explanation of a user's interaction with the model, we explain the 10-stage Tailored Approach in detail.

A Tailored Approach is intended for use in complex reviews and as one potential alternative to the Conventional Approach. While the Conventional Approach is defined by its use of comprehensive bibliographic and non-bibliographic searches to identify all available studies, A Tailored Approach aims to allocate search methods and to distribute searching time to the process of study identification. The focus of A Tailored Approach may not be on a comprehensive search for studies. Both models aim to retain a systematic approach to study identification.

A Tailored Approach suggests investing time to develop the information needs and search approach and developing these as a team rather than the work of an individual researcher. Further research is indicated to continue to evaluate the use of supplementary search methods and to evaluate the use of theory-driven models of information retrieval for testing and evaluation.

Acknowledgements

We acknowledge with thanks Prof. Chris Hyde's contribution to the research project. We acknowledge, directly, the work of the authors of the models reported in Table 2, specifically Taylor, Belvin, Dervin, Bates and Kuhlthau: 'at last, I should find that low door in the wall, which others, I knew, had found before me, which opened on an enclosed and enchanted garden' [166]. The lead author acknowledges the following people who have influenced and encouraged (but should not be held responsible for) the work reported here: Theo Lorenc, Alison O'Mara-Eves, Isaac Maerro, Alan Gomersall, FJ, Paul Levay, Carol Lefebvre and Julie Glanville.

Author's Note

Chris Cooper is also affiliated to Department of Clinical, Educational and Health Psychology, University College London, London, United Kingdom.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The ideas explored here were developed as part of a research project funded through the National Institute for Health Research (NIHR) Health Technology Assessment (HTA) Programme (Project Number 16/54/11). The PI was Prof. Chris Hyde. The writing of this article, and

visualisations of the models, were unfunded and undertaken by Chris Cooper after the research funding mentioned above had finished. Dr Booth contributed under his University of Sheffield contract. Dr Husk: This article is independent research supported by the National Institute for Health Research Applied Research Collaboration South West Peninsula. The views expressed in this publication are those of the authors and not necessarily those of the National Institute for Health Research or the Department of Health and Social Care. Professor Garside and Professor Britten were partially supported by the National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care (CLAHRC) South West Peninsula, now recommissioned as NIHR Applied Research Collaboration (ARC) South West Peninsula. The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health and Social Care. Dr Frost, Dr Lovell and Miss Schauberger were not funded for their work.

ORCID iD

Chris Cooper https://orcid.org/0000-0003-0864-5607

Supplemental material

Supplemental material for this article is available online.

Note

1. The original sampling frame for the Conventional Approach relied on nine guidance handbooks. Peer review of the paper which reported the Conventional Approach criticised the focus on European guidance and the exclusion of North American guidance. Two further guidance documents were added for this article, namely: AHRQ and the Effective Health Care Program guidance and The Institute of Medicine's Finding What Works in Health Care: Standards for Systematic Reviews. The inclusion of these additional handbooks did not alter the findings of the Conventional Approach but the sampling frame is now more representative of best practice guidance.

References

[1] Cooper C, Booth A, Varley-Campbell J et al. Defining the process to literature searching in systematic reviews: a literature review of guidance and supporting studies. *BMC Med Res Methodol* 2018; 18: 85.
[2] Cooper C. *Improving literature searching in systematic reviews: the application of tailored literature searching compared to 'the conventional approach'*. PhD Dissertation, University of Exeter, Exeter, 2019.
[3] Fehrmann P and Thomas J. Comprehensive computer searches and reporting in systematic reviews. *Res Synth Methods* 2011; 2: 15–32.
[4] Bates MJ. The design of browsing and berrypicking techniques for the online search interface. *Online Rev* 1989; 13: 407–424.
[5] Belkin NJ. Anomalous states of knowledge as a basis for information retrieval. *Can J Inform Sci* 1980; 5: 133–143.
[6] Belkin NJ, Oddy RN and Brooks HM. Ask for information retrieval: Part I. Background and theory. *J Doc* 1982; 38: 61–71.
[7] Byström K and Hansen P. Work tasks as units for analysis in information seeking and retrieval studies. In: *Presented at the Emerging Frameworks and Methods: Fourth International Conference on Conceptions of Library and Information Science (CoLIS4)*, Seattle, Washington, USA, 21–25 July 2002. http://urn.kb.se/resolve?urn=urn:nbn:se:ri:diva-22508.
[8] Ellis D. A behavioural approach to information retrieval system design. *J Doc* 1989; 45: 171–212.
[9] Ellis D. Modeling the information-seeking patterns of academic researchers: a grounded theory approach. *Libr Quart* 1993; 63: 469–486.
[10] Kuhlthau CC. Inside the search process: information seeking from the user's perspective. *J Am Soc Inform Sci* 1991; 42: 361–371.
[11] Taylor RS. The process of asking questions. *Am Doc* 1962; 13: 391–396.
[12] Wilson TD. On user studies and information needs. *J Doc* 1981; 37: 3–15.
[13] Wilson TD. Information behaviour: an interdisciplinary perspective. *Inform Process Manag* 1997; 33: 551–572.
[14] Cooper C, Lovell R, Husk K et al. Supplementary search methods were more effective and offered better value than bibliographic database searching: a case study from public health and environmental enhancement. *Res Synth Methods* 2018; 9: 195–223.
[15] Livoreil B, Glanville J, Haddaway NR et al. Systematic searching for environmental evidence using multiple tools and sources. *Environ Evid* 2017; 6: 23.
[16] Mahtani KR, Jefferson T, Heneghan C et al. What is a 'complex systematic review'? Criteria, definition, and examples. *BMJ Evid Based Med* 2018; 23: 127–130.
[17] Cooper C, Booth A, Britten N et al. A comparison of results of empirical studies of supplementary search techniques and recommendations in review methodology handbooks: a methodological review. *Syst Rev* 2017; 6: 234.
[18] Centre for Reviews and Dissemination (CRD). *Systematic reviews – CRD's guidance for undertaking reviews in healthcare*. 3rd ed. York: CRD, University of York, 2009.

[19] Collaboration for Environmental Evidence (CEE). *Guidelines for systematic review and evidence synthesis in environmental management*. Bangor: CEE, 2013.
[20] Relevo R and Balshem H. Finding evidence for comparing medical interventions: AHRQ and the Effective Health Care Program. *J Clin Epidemiol* 2011; 64: 1168–1177.
[21] The Institute of Medicine (IOM). *Finding what works in health care: standards for systematic reviews*. Washington, DC: The National Academies Press, 2011.
[22] Lefebvre C, Manheimer E and Glanville J. Chapter 6: searching for studies. In: Higgins JPT and Green S (eds) *Cochrane handbook for systematic reviews of interventions*. London: The Cochrane Collaboration, 2011.
[23] The Joanna Briggs Institute (JBI). *Joanna Briggs Institute reviewers' manual: 2014 edition*. Adelaide, SA, Australia: JBI, 2014.
[24] Institute for Quality and Efficiency in Health Care (IQWiG). *IQWiG methods resources. 7 information retrieval*. Berlin: IQWiG, 2014.
[25] Petticrew M and Roberts H. *Systematic reviews in the social sciences: a practical guide*. Oxford: Blackwell Publishing Ltd, 2006.
[26] European Network for Health Technology Assessment (EUnetHTA). *Process of information retrieval for systematic reviews and health technology assessments on clinical effectiveness*. Diemen: EUnetHTA, 2016.
[27] Kugley SWA, Thomas J, Mahood Q et al. *Searching for studies: a guide to information retrieval for Campbell systematic reviews*. Oslo: Campbell Collaboration, 2017.
[28] National Institute for Health and Care Excellence (NICE). *Developing NICE guidelines: the manual*. London: NICE, 2014.
[29] Dervin B. An overview of sense-making research: concepts, methods, and results to date. In: *Proceedings of the international communication association annual meeting*, Dallas, TX, May 1983. https://www.worldcat.org/title/overview-of-sense-making-research-concepts-methods-and-results-to-date/oclc/733067203
[30] Sandelowski M, Barroso J and Voils CI. Using qualitative metasummary to synthesize qualitative and quantitative descriptive findings. *Res Nurs Health* 2007; 30: 99–111.
[31] Du JT. The information journey of marketing professionals: incorporating work task-driven information seeking, information judgments, information use, and information sharing. *J Assoc Inf Sci Tech* 2014; 65: 1850–1869.
[32] Egger M, Juni P, Bartlett C et al. How important are comprehensive literature searches and the assessment of trial quality in systematic reviews? Empirical study. *Health Technol Assess* 2003; 7: 1–76.
[33] Petticrew M. Time to rethink the systematic review catechism? Moving from 'what works' to 'what happens'. *Syst Rev* 2015; 4: 36.
[34] Betrán AP, Say L, Gülmezoglu AM et al. Effectiveness of different databases in identifying studies for systematic reviews: experience from the WHO systematic review of maternal morbidity and mortality. *BMC Med Res Methodol* 2005; 5: 6.
[35] Papaioannou D, Sutton A, Carroll C et al. Literature searching for social science systematic reviews: consideration of a range of search techniques. *Health Info Libr J* 2010; 27: 114–122.
[36] Jadad AR and McQuay HJ. A high-yield strategy to identify randomized controlled trials for systematic reviews. *Online J Curr Clin Trials* 1993, https://pubmed.ncbi.nlm.nih.gov/8306000/
[37] Rader T, Mann M, Stansfield C et al. Methods for documenting systematic review searches: a discussion of common issues. *Res Synth Methods* 2014; 5: 98–115.
[38] Moher D, Liberati A, Tetzlaff J et al. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *J Clin Epidemiol* 2009; 62: 1006–1012.
[39] Gough D. Weight of evidence: a framework for the appraisal of the quality and relevance of evidence. *Res Pap Educ* 2007; 22: 213–228.
[40] Wagner G, Nussbaumer-Streit B, Greimel J et al. Trading certainty for speed – how much uncertainty are decisionmakers and guideline developers willing to accept when using rapid reviews: an international survey. *BMC Med Res Methodol* 2017; 17: 121.
[41] Nussbaumer-Streit B, Klerings I, Wagner G et al. Abbreviated literature searches were viable alternatives to comprehensive searches: a meta-epidemiological study. *J Clin Epidemiol* 2018; 102: 1–11.
[42] Paisley S and Foster MJ. Innovation in information retrieval methods for evidence synthesis studies. *Res Synth Methods* 2018; 9: 506–509.
[43] Heneghan C and Godlee F. Where next for evidence based healthcare? *BMJ* 2013; 346: f766.
[44] Lefebvre C, Glanville J, Wieland LS et al. Methodological developments in searching for studies for systematic reviews: past, present and future? *Syst Rev* 2013; 2: 78.
[45] Lefebvre C. The Cochrane Collaboration: the role of the UK Cochrane Centre in identifying the evidence. *Health Libr Rev* 1994; 11: 235–242.
[46] Lefebvre C. *Identification of randomized controlled trials using MEDLINE: the situation in 1993*. Bethesda, MD: Office of Medical Applications of Research, National Institutes of Health (NIH), 1993.

[47] Lefebvre C, Eisinga A, McDonald S et al. Enhancing access to reports of randomized trials published world-wide – the contribution of EMBASE records to the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library. *Emerg Themes Epidemiol* 2008; 5: 13.
[48] Leng GC, Jepson RG and Fowkes FG. Why we need the Cochrane Collaboration. *Int Angiol* 1996; 15: 81–83.
[49] Royle PL, Bain L and Waugh NR. Systematic reviews of epidemiology in diabetes: finding the evidence. *BMC Med Res Methodol* 2005; 5: 2.
[50] Royle PL and Milne NR. Literature searching for randomized controlled trials used in Cochrane reviews: rapid versus exhaustive searches. *Int J Technol Assess Health Care* 2003; 19: 591–603.
[51] Royle PL and Waugh NR. A simplified search strategy for identifying randomised controlled trials for systematic reviews of health care interventions: a comparison with more exhaustive strategies. *BMC Med Res Methodol* 2005; 5: 23.
[52] Royle PL and Waugh NR. Making literature searches easier: a rapid and sensitive search filter for retrieving randomized controlled trials from PubMed. *Diabet Med* 2007; 24: 308–311.
[53] Dickersin K, Manheimer E, Wieland S et al. Development of the Cochrane Collaboration's CENTRAL Register of controlled clinical trials. *Eval Health Prof* 2002; 25: 38–64.
[54] Dickersin K, Scherer R and Lefebvre C. Identifying relevant studies for systematic reviews. *BMJ* 1994; 309: 1286–1291.
[55] Glanville JM, Lefebvre C, Miles JNV et al. How to identify randomized controlled trials in MEDLINE: ten years on. *J Med Libr Assoc* 2006; 94: 130–136.
[56] Dixon-Woods M, Fitzpatrick R and Roberts K. Including qualitative research in systematic reviews: opportunities and problems. *J Eval Clin Pract* 2001; 7: 125–133.
[57] Shaw RL, Booth A, Sutton AJ et al. Finding qualitative research: an evaluation of search strategies. *BMC Med Res Methodol* 2004; 4: 5.
[58] Leeflang MMG, Scholten RJPM, Rutjes AWS et al. Use of methodological search filters to identify diagnostic accuracy studies can lead to the omission of relevant studies. *J Clin Epidemiol* 2006; 59: 234–240.
[59] Bayliss SE, Davenport CF and Pennant ME. Where and how to search for information on the effectiveness of public health interventions – a case study for prevention of cardiovascular disease. *Health Info Libr J* 2014; 31: 303–313.
[60] Geersing GJ, Bouwmeester W, Zuithoff P et al. Search filters for finding prognostic and diagnostic prediction studies in Medline to enhance systematic reviews. *PLoS One* 2012; 7: e32844.
[61] Mann R and Gilbody SM. Should methodological filters for diagnostic test accuracy studies be used in systematic reviews of psychometric instruments? A case study involving screening for postnatal depression. *Syst Rev* 2012; 1: 9.
[62] Whiting P, Westwood M, Beynon R et al. Inclusion of methodological filters in searches for diagnostic test accuracy studies misses relevant studies. *J Clin Epidemiol* 2011; 64: 602–607.
[63] Ritchie G, Glanville J and Lefebvre C. Do published search filters to identify diagnostic test accuracy studies perform adequately? *Health Info Libr J* 2007; 24: 188–192.
[64] Anderson LM, Oliver SR, Michie S et al. Investigating complexity in systematic reviews of interventions by using a spectrum of methods. *J Clin Epidemiol* 2013; 66: 1223–1229.
[65] Noyes J, Gough D, Lewin S et al. A research and development agenda for systematic reviews that ask complex questions about complex interventions. *J Clin Epidemiol* 2013; 66: 1262–1270.
[66] Booth A. How much searching is enough? Comprehensive versus optimal retrieval for technology assessments. *Int J Technol Assess Health Care* 2010; 26: 431–435.
[67] Booth A. Searching for qualitative research for inclusion in systematic reviews: a structured methodological review. *Syst Rev* 2016; 5: 74.
[68] Booth A. State of the art, state of the science? *Res Synth Methods* 2018; 9: 615–618.
[69] Booth A. Cochrane or cock-eyed? How should we conduct systematic reviews of qualitative research. In: *Proceedings of the qualitative evidence-based practice: taking a critical stance*, Coventry University, Coventry, 14–16 May 2001.
[70] Adams J, Hillier-Brown FC, Moore HJ et al. Searching and synthesising 'grey literature' and 'grey information' in public health: critical reflections on three case studies. *Syst Rev* 2016; 5: 164.
[71] Cooper C, Garside R, Varley-Campbell J et al. 'It has no meaning to me'. How do researchers understand the effectiveness of literature searches? A qualitative analysis and preliminary typology of understandings. *Res Synth Methods* 2020; 11: 627–640.
[72] Beahler CC, Sundheim JJ and Trapp NI. Information retrieval in systematic reviews: challenges in the public health arena. *Am J Prev Med* 2000; 18: 6–10.
[73] Ogilvie D, Egan M, Hamilton V et al. Systematic reviews of health effects of social interventions: 2. Best available evidence: how low should you go? *J Epidemiol Community Health* 2005; 59: 886–892.
[74] Ogilvie D, Hamilton V, Egan M et al. Systematic reviews of health effects of social interventions: 1. Finding the evidence: how far should you go? *J Epidemiol Community Health* 2005; 59: 804–808.
[75] Grayson L and Gomersall A. *A difficult business: finding the evidence for social science reviews*. ESRC UK Centre for Evidence Based Policy and Practice, Working paper no. 19, 2003. London: ESRC UK Centre for Evidence Based Policy and Practice.
[76] Clapton J. *Bibliographic databases for social care searching*. SCIE report no. 34, July 2010. London: Social Care Institute for Excellence (SCIE).

[77] Cooper C and Gomersall A. *WS68: database selection bias and its affect on systematic reviews: a United Kingdom perspective*. Keystone, CO: Joint Colloquium of the Cochrane and Campbell Collaborations, 2010.
[78] Beyer FR and Wright K. Can we prioritise which databases to search? A case study using a systematic review of frozen shoulder management. *Health Info Libr J* 2013; 30: 49–58.
[79] Delaney A and Tamás PA. Searching for evidence or approval? A commentary on database search in systematic reviews and alternative information retrieval methodologies. *Res Synth Methods* 2018; 9: 124–131.
[80] Kelly L and St Pierre-Hansen N. So many databases, such little clarity: searching the literature for the topic aboriginal. *Can Fam Physician* 2008; 54: 1572–1573.
[81] Kwon Y, Powelson SE, Wong H et al. An assessment of the efficacy of searching in biomedical databases beyond MEDLINE in identifying studies for a systematic review on ward closures as an infection control intervention to control outbreaks. *Syst Rev* 2014; 3: 135.
[82] Chang Y-W. The influence of Taylor's paper, *Question-Negotiation and Information-Seeking in Libraries. Inform Process Manag* 2013; 49: 983–994.
[83] Denyer D and Tranfield D. Producing a systematic review. In: Buchanan DA and Bryman A (eds) *The SAGE handbook of organizational research methods*. London: SAGE, 2009, pp. 671–690.
[84] Paisley S. *Identifying evidence to inform decision-analytic models of cost-effectiveness: a qualitative study of information seeking processes and behavior*. PhD Dissertation, The University of Sheffield, Sheffield, 2012.
[85] Armstrong R, Hall BJ, Doyle J et al. Cochrane update. 'Scoping the scope' of a Cochrane review. *J Public Health* 2011; 33: 147–150.
[86] Armstrong R, Waters E and Doyle J. Chapter 21: reviews in health promotion and public health. In: Higgins JPT and Green S (eds) *Cochrane handbook for systematic reviews of interventions*. London: The Cochrane Collaboration, 2011.
[87] Abrams R, Park S, Wong G et al. Lost in reviews: looking for the involvement of stakeholders, patients, public and other non-researcher contributors in realist reviews. *Res Synth Methods* 2021; 12: 239–247.
[88] Wong G. Data gathering in realist reviews: looking for needles in haystacks. In: Emmel N, Greenhalgh G, Manzano A et al. (eds) *Doing realist research*. London: SAGE, 2018, pp. 131–146.
[89] Bernstein F. The retrieval of randomized clinical trials in liver diseases from the medical literature: manual versus MEDLARS searches. *Control Clin Trials* 1988; 9: 23–31.
[90] Li L, Tian J, Tian H et al. Network meta-analyses could be improved by searching more sources and by involving a librarian. *J Clin Epidemiol* 2014; 67: 1001–1007.
[91] Rethlefsen ML, Farrell AM, Osterhaus Trzasko LC et al. Librarian co-authors correlated with higher quality reported search strategies in general internal medicine systematic reviews. *J Clin Epidemiol* 2015; 68: 617–626.
[92] Dudden RF and Protzko SL. The systematic review team: contributions of the health sciences librarian. *Med Ref Serv Q* 2011; 30: 301–315.
[93] Pawson R. *Evidence-based policy: a realist perspective*. London: SAGE, 2006.
[94] Beverley CA, Booth A and Bath PA. The role of the information specialist in the systematic review process: a health information case study. *Health Info Libr J* 2003; 20: 65–74.
[95] Harris MR. The librarian's roles in the systematic review process: a case study. *J Med Libr Assoc* 2005; 93: 81–87.
[96] Koffel JB. Use of recommended search strategies in systematic reviews and the impact of librarian involvement: a cross-sectional survey of recent authors. *PLoS One* 2015; 10: e0125931.
[97] McGowan J and Sampson M. Systematic reviews need systematic searchers. *J Med Libr Assoc* 2005; 93: 74–80.
[98] Weller AC. Mounting evidence that librarians are essential for comprehensive literature searches for meta-analyses and Cochrane reports. *J Med Libr Assoc* 2004; 92: 163–164.
[99] Lorenc T, Pearson M, Jamal F et al. The role of systematic reviews of qualitative evidence in evaluating interventions: a case study. *Res Synth Methods* 2012; 3: 1–10.
[100] Duddy C and Roberts N. Identifying evidence for five realist reviews in primary health care: a comparison of search methods. *Res Synth Methods* 2022; 13: 190–203.
[101] Tsang A and Maden M. CLUSTER searching approach to inform evidence syntheses: a methodological review. *Res Synth Methods* 2021; 12: 576–589.
[102] Booth A and Wright JM Briscoe S. Scoping and searching to support realist approaches. In: Emmel N, Greenhalgh G, Manzano A et al. (eds) *Doing realist research*. London: SAGE, 2018, pp. 147–166.
[103] Chalmers I. The Cochrane collaboration: preparing, maintaining, and disseminating systematic reviews of the effects of health care. *Ann N Y Acad Sci* 1993; 703: 156–163.
[104] Cooper C, Levay P, Lorenc T et al. A population search filter for hard-to-reach populations increased search efficiency for a systematic review. *J Clin Epidemiol* 2014; 67: 554–559.
[105] Cooper C, Varley-Campbell J, Booth A et al. Systematic review identifies six metrics and one method for assessing literature search effectiveness but no consensus on appropriate use. *J Clin Epidemiol* 2018; 99: 53–63.
[106] Booth A and Carroll C. Systematic searching for theory to inform systematic reviews: is it feasible? Is it desirable? *Health Info Libr J* 2015; 32: 220–235.

[107] Booth A. The number needed to retrieve: a practically useful measure of information retrieval? *Health Info Libr J* 2006; 23: 229–232.
[108] Campbell M, Fitzpatrick R, Haines A et al. Framework for design and evaluation of complex interventions to improve health. *BMJ* 2000; 321: 694–696.
[109] Critical Appraisal Skills Programme (CASP). CASP qualitative checklist, 2018, https://casp-uk.net/wp-content/uploads/2018/03/CASP-Qualitative-Checklist-2018_fillable_form.pdf
[110] Booth A. Clear and present questions: formulating questions for evidence based practice. *Libr Hi Tech* 2006; 24: 355–368.
[111] Kneale D, Thomas J and Harris K. Developing and optimising the use of logic models in systematic reviews: exploring practice and good practice in the use of programme theory in reviews. *PLoS One* 2015; 10: e0142187.
[112] Archer R, Paisley S, Essat M et al. Iterative sifting in the selection of research evidence: implications for reviews and other decision problems. *Int J Technol Assess Health Care* 2015; 31: 54–58.
[113] Colquhoun HL, Levac D, O'Brien KK et al. Scoping reviews: time for clarity in definition, methods, and reporting. *J Clin Epidemiol* 2014; 67: 1291–1294.
[114] Levac D, Colquhoun H and O'Brien KK. Scoping studies: advancing the methodology. *Implement Sci* 2010; 5: 69.
[115] Arksey H and O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Method* 2005; 8: 19–32.
[116] O'Brien KK, Colquhoun H, Levac DE et al. Advancing scoping study methodology: a web-based survey and consultation of perceptions on terminology, definition and methodological steps. *BMC Health Serv Res* 2016; 16: 305.
[117] Anderson S, Allen P, Peckham S et al. Asking the right questions: scoping studies in the commissioning of research on the organisation and delivery of health services. *Health Res Policy Syst* 2008; 6: 6–7.
[118] Morris M, Boruff JT and Gore GC. Scoping reviews: establishing the role of the librarian. *J Med Libr Assoc* 2016; 104: 346–354.
[119] Munn Z, Stern C, Aromataris E et al. What kind of systematic review should I conduct? A proposed typology and guidance for systematic reviewers in the medical and health sciences. *BMC Med Res Methodol* 2018; 18: 5.
[120] Grant MJ and Booth A. A typology of reviews: an analysis of 14 review types and associated methodologies. *Health Info Libr J* 2009; 26: 91–108.
[121] Hausner E, Guddat C, Hermanns T et al. Development of search strategies for systematic reviews: validation showed the non-inferiority of the objective approach. *J Clin Epidemiol* 2015; 68: 191–199.
[122] Hausner E, Guddat C, Hermanns T et al. Prospective comparison of search strategies for systematic reviews: an objective approach yielded higher sensitivity than a conceptual one. *J Clin Epidemiol* 2016; 77: 118–124.
[123] Hausner E, Waffenschmidt S, Kaiser T et al. Routine development of objectively derived search strategies. *Syst Rev* 2012; 1: 19.
[124] 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; 21: 21–32.
[125] Salton G. *Automatic information organization and retrieval*. New York: McGraw Hill, 1968.
[126] Wong G, Greenhalgh T, Westhorp G et al. RAMESES publication standards: realist syntheses. *BMC Med* 2013; 11: 21.
[127] Booth A, Harris J, Croot E et al. Towards a methodology for cluster searching to provide conceptual and contextual 'richness' for systematic reviews of complex interventions: case study (CLUSTER). *BMC Med Res Methodol* 2013; 13: 118.
[128] Booth A. Unpacking your literature search toolbox: on search styles and tactics. *Health Info Libr J* 2008; 25: 313–317.
[129] Talens-Bou J, Cooper C and Varley-Campbell J. PP29 evaluating supplementary search methods: outcomes to measure and why. *Int J Technol Assess* 2018; 34: 77.
[130] Cooper C, Dawson S, Peters J et al. Revisiting the need for a literature search narrative: a brief methodological note. *Res Synth Methods* 2018; 9: 361–365.
[131] Craven J and Levay P. Recording database searches for systematic reviews – what is the value of adding a narrative to peer-review checklists? A case study of NICE interventional procedures guidance. *Evid Based Libr Inf Pract* 2011; 6: 72–87.
[132] Nutter S, Ireland A, Alberga AS et al. Weight bias in educational settings: a systematic review. *Curr Obes Rep* 2019; 8: 185–200.
[133] Biocic M, Fidahic M, Cikes K et al. Comparison of information sources used in Cochrane and non-Cochrane systematic reviews: a case study in the field of anesthesiology and pain. *Res Synth Methods* 2019; 10: 597–605.
[134] National Institute for Health and Care Excellence (NICE). *Methods for the development of NICE public health guidance*. 2nd ed. London: NICE, 2009.
[135] Heath A, Levay P and Tuvey D. Literature searching methods or guidance and their application to public health topics: a narrative review. *Health Info Libr J* 2022; 39: 6–21.
[136] Waffenschmidt S and Hausner E. Collaborative working to improve searching. In: Levay P and Craven J (eds) *Systematic searching: practical ideas for improving results*. London: Facet, 2019, pp. 229–248.
[137] Uttley L and Montgomery P. The influence of the team in conducting a systematic review. *Syst Rev* 2017; 6: 149.
[138] Gøtzsche PC and Ioannidis JPA. Content area experts as authors: helpful or harmful for systematic reviews and meta-analyses? *BMJ* 2012; 345: e7031.
[139] Husk K, Lovell R, Cooper C et al. Participation in environmental enhancement and conservation activities for health and well-being in adults: a review of quantitative and qualitative evidence. *Cochrane Database Syst Rev* 2016; 2016: CD010351.

[140] Whipple EC, McGowan JJ, Dixon BE et al. The selection of high-impact health informatics literature: a comparison of results between the content expert and the expert searcher. *J Med Libr Assoc* 2009; 97: 212–218.
[141] Hsieh-Yee I. Effects of search experience and subject knowledge on the search tactics of novice and experienced searchers. *J Am Soc Inform Sci* 1993; 44: 161–174.
[142] Fleurence RL, Forsythe LP, Lauer M et al. Engaging patients and stakeholders in research proposal review: the patient-centered outcomes research institute. *Ann Intern Med* 2014; 161: 122–130.
[143] Cooper C. Planning and budgeting for systematic reviews, 2017, https://www.cochrane.de/lit_vortrag_planning_and_budgeting
[144] Greenhalgh T and Peacock R. Effectiveness and efficiency of search methods in systematic reviews of complex evidence: audit of primary sources. *BMJ* 2005; 331: 1064–1065.
[145] Pearson M, Moxham T and Ashton K. Effectiveness of search strategies for qualitative research about barriers and facilitators of program delivery. *Eval Health Prof* 2011; 34: 297–308.
[146] Hopewell S, Clarke M, Lusher A et al. A comparison of handsearching versus MEDLINE searching to identify reports of randomized controlled trials. *Stat Med* 2002; 21: 1625–1634.
[147] Levay P, Ainsworth N, Kettle R et al. Identifying evidence for public health guidance: a comparison of citation searching with Web of Science and Google Scholar. *Res Synth Methods* 2016; 7: 34–45.
[148] Wright K, Golder S and Rodriguez-Lopez R. Citation searching: a systematic review case study of multiple risk behaviour interventions. *BMC Med Res Methodol* 2014; 14: 73.
[149] McManus RJ, Wilson S, Delaney BC et al. Review of the usefulness of contacting other experts when conducting a literature search for systematic reviews. *BMJ* 1998; 317: 1562–1563.
[150] Aagaard T, Lund H and Juhl C. Optimizing literature search in systematic reviews – are MEDLINE, EMBASE and CENTRAL enough for identifying effect studies within the area of musculoskeletal disorders? *BMC Med Res Methodol* 2016; 16: 161.
[151] Baeza-Yates R. Information retrieval in the Web: beyond current search engines. *Int J Approx Reason* 2003; 34: 97–104.
[152] Beckles Z, Glover S, Ashe J et al. Searching CINAHL did not add value to clinical questions posed in NICE guidelines. *J Clin Epidemiol* 2013; 66: 1051–1057.
[153] Stansfield C, Brunton G and Rees R. Search wide, dig deep: literature searching for qualitative research. An analysis of the publication formats and information sources used for four systematic reviews in public health. *Res Synth Methods* 2014; 5: 142–151.
[154] Stansfield C, Kavanagh J, Rees R et al. The selection of search sources influences the findings of a systematic review of people's views: a case study in public health. *BMC Med Res Methodol* 2012; 12: 55.
[155] Stapleton J, Carter C and Bredahl L. Developing systematic search methods for the library literature: methods and analysis. *J Acad Libr* 2020; 46: 102190.
[156] O'Mara-Eves A, Brunton G, McDaid D et al. Techniques for identifying cross-disciplinary and 'hard-to-detect' evidence for systematic review. *Res Synth Methods* 2014; 5: 50–59.
[157] Haddaway NR and Westgate MJ. Predicting the time needed for environmental systematic reviews and systematic maps. *Conserv Biol* 2019; 33: 434–443.
[158] Bullers K, Howard AM, Hanson A et al. It takes longer than you think: librarian time spent on systematic review tasks. *J Med Libr Assoc* 2018; 106: 198–207.
[159] Liberati A, Altman DG, Tetzlaff J et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration. *BMJ* 2009; 339: b2700.
[160] Rethlefsen M, Kirtley S, Waffenschmidt S et al.; PRISMA-S Group. PRISMA-S: an extension to the PRISMA statement for reporting literature searches in systematic reviews. *Syst Rev* 2021; 10: 39.
[161] Wong G, Greenhalgh T, Westhorp G et al.; Health Services and Delivery Research. *Development of methodological guidance, publication standards and training materials for realist and meta-narrative reviews: the RAMESES (Realist and Meta-narrative Evidence Syntheses – Evolving Standards) project*. Southampton: NIHR Journals Library, 2014.
[162] Eysenbach G, Tuische J and Diepgen TL. Evaluation of the usefulness of Internet searches to identify unpublished clinical trials for systematic reviews. *Med Inform Internet Med* 2001; 26: 203–218.
[163] Stansfield C, Dickson K and Bangpan M. Exploring issues in the conduct of website searching and other online sources for systematic reviews: how can we be systematic? *Syst Rev* 2016; 5: 191.
[164] Cooper C, Lorenc T and Schauberger U. What you see depends on where you sit: the effect of geographical location on web-searching for systematic reviews: a case study. *Res Synth Methods* 2021; 12: 557–570.
[165] Booth A, Briscoe S and Wright JM. The 'realist search': a systematic scoping review of current practice and reporting. *Res Synth Methods* 2020; 11: 14–35.
[166] Waugh E. *Brideshead revisited: the sacred and profane memories of captain Charles Ryder*. London: Chapman & Hall, 1949.