



# Systematic Literature Reviews in the Health and Social Sciences: Tools, Techniques and Tips

This interactive guide presents an accessible overview of the key principles, techniques and tools for a successful systematic literature review in the health and social sciences. Printable reading lists are included at the end of each main section, together with note-taking exercises, good practice tips and a recap quiz. This resource aims to empower undergraduate and postgraduate students to undertake literature review projects confidently and rigorously – following the most recent methodological guidance.

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- ≡ What Makes a Literature Review 'Systematic' and Getting Started
- ≡ Is a Systematic Review Right for My Project? Comparing Review Types
- ≡ Key Stages: Search, Screening, Extraction, Appraisal and Synthesis
- ≡ Appraising Systematic Reviews
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# What Makes a Literature Review 'Systematic' and Getting Started

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This section explains what systematic reviews are and why they are important. The main stages of a systematic review are briefly introduced before a detailed discussion of what must be done before one commences such a research project. The PRISMA guidelines, a crucial tool for conducting a systematic review, are also introduced.

## Glossary

Engage with this resource to learn the definitions of some terms that will be covered.



Please note:

In the PDF version of this module, interactive elements will not be available. If you wish to complete the interactive module, this can be accessed online via <https://edshare.gla.ac.uk/1428/2/content/index.html#/>

**Bias:** A systematic error likely to detract from the truth.

**Evidence Hierarchy:** An ordering of knowledge that prioritises experimental over observational studies, quantitative over qualitative, and scientific investigation over expert opinion or anecdote. The value of such hierarchies is contested.

**Reporting Guidelines:** Tools to guide researchers, editors, and reviewers on essential information to present in a study report. These are design-specific (e.g., CONSORT for randomised controlled trials).

**Randomised Controlled Trial (RCT):**

A study whereby similar people are randomly assigned to 2 (or more) groups. One group receives an experimental intervention, the other receives an alternative intervention, placebo, or nothing. The groups are followed to see how effective the experimental intervention is, with group differences assessed statistically.

**Eligibility Criteria:** Determinants of which people, time period, or conditions qualify for a study/review.

**Epidemiological:** Relating to the branch of medicine that deals with the incidence, distribution, and control of diseases.

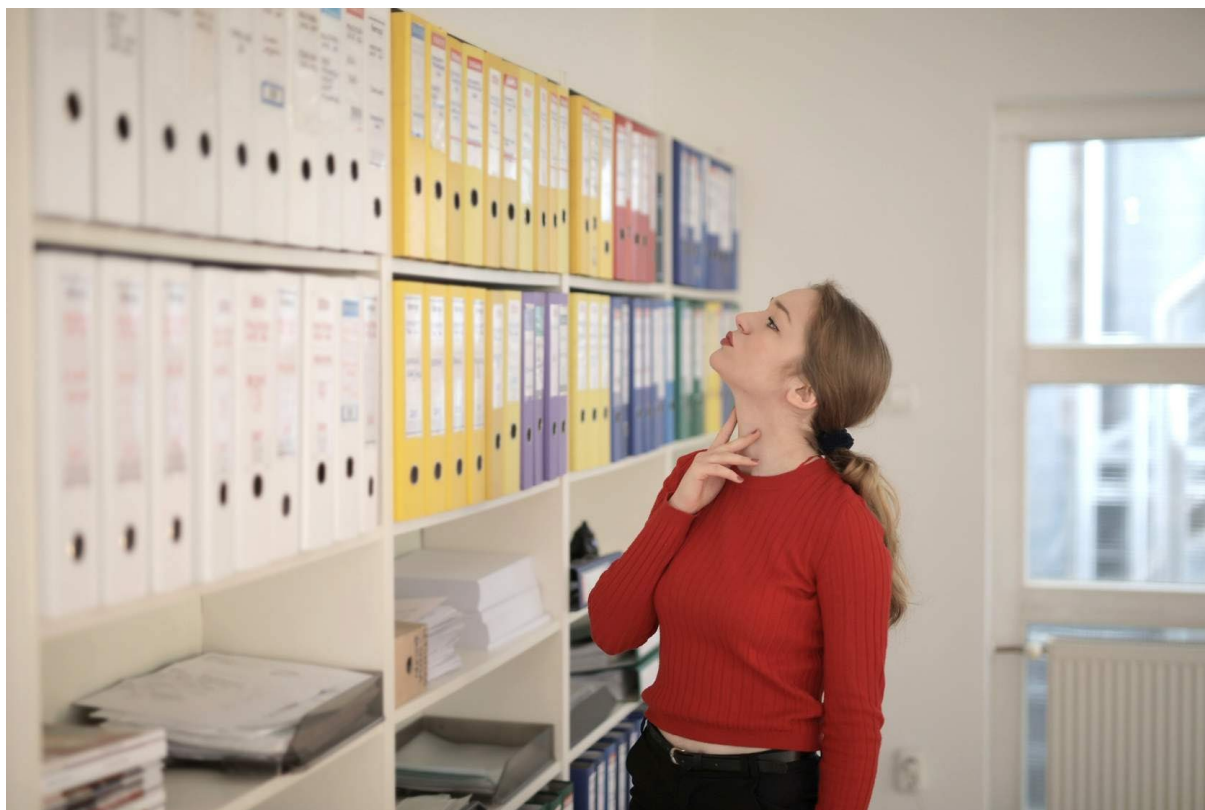
## What is a Systematic Review?



**“Systematic review—A review that uses explicit, systematic methods to collate and synthesise findings of studies that address a formulated question.” ([Page et al., 2021](#))**

Evidence-based decision-making in policy and practice relies on the syntheses of all available evidence about a topic or problem. Integrating findings from an ever-expanding body of research is essential to make them accessible to researchers and practitioners.





Well-conducted systematic reviews clearly define at the outset which criteria determine if studies will be included for review or excluded. They identify all relevant literature, rigorously appraise possible biases in the reviewed studies, and methodically synthesise the results from the individual studies. Due to their comprehensiveness and rigour, systematic reviews are considered the cornerstone of evidence-based practice ([MacMillan et al., 2019](#)).

# What Makes a Literature Review 'Systematic'?

There are a number of defining features of systematic reviews to ensure the degree of rigour and systematicity of procedures ([Hammersley, 2013](#)):



Operationalised inclusion and exclusion criteria

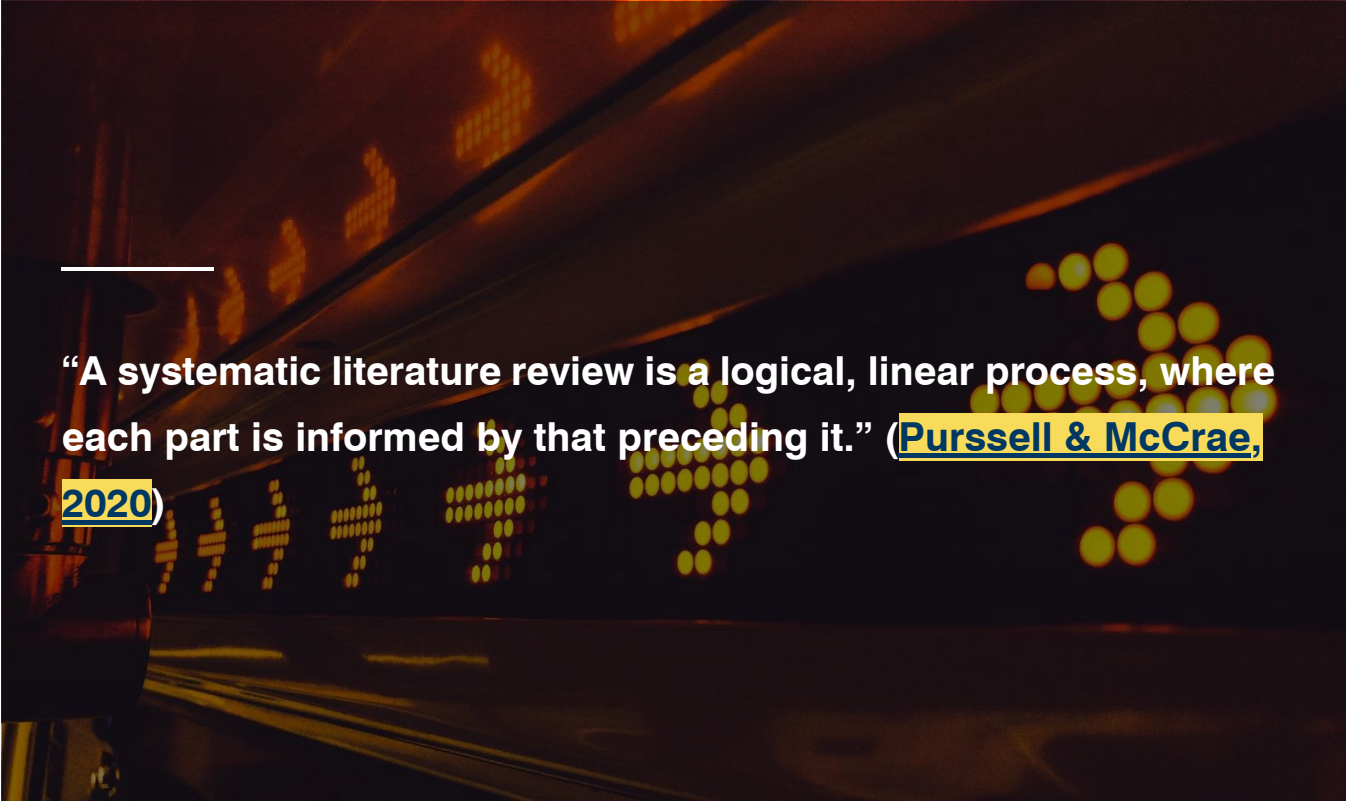
Wide-ranging search for all relevant literature

Aims to provide research-based answers to specific problems that have a strong relevance to policy and/or practice

Systematically combines reviewed studies' findings, producing more robust conclusions

Study selection guided by an evidence hierarchy

## Stages of the Systematic Review



“A systematic literature review is a logical, linear process, where each part is informed by that preceding it.” (Purssell & McCrae, 2020)

Informed by the most recent best practice guides, appraisal tools, and reporting guidelines, rigorous systematic reviews follow several key stages ([MacMillan et al., 2019](#)):



## Defining the Research Question

A systematic review's aim(s) must be clear and amenable to methodical enquiry. Consider two versions of this review question discussed by [Purssell and McCrae \(2020\)](#).



“What is known about the influenza vaccine in older people?”

- This question is too broad and, therefore, not suitable for a systematic review.
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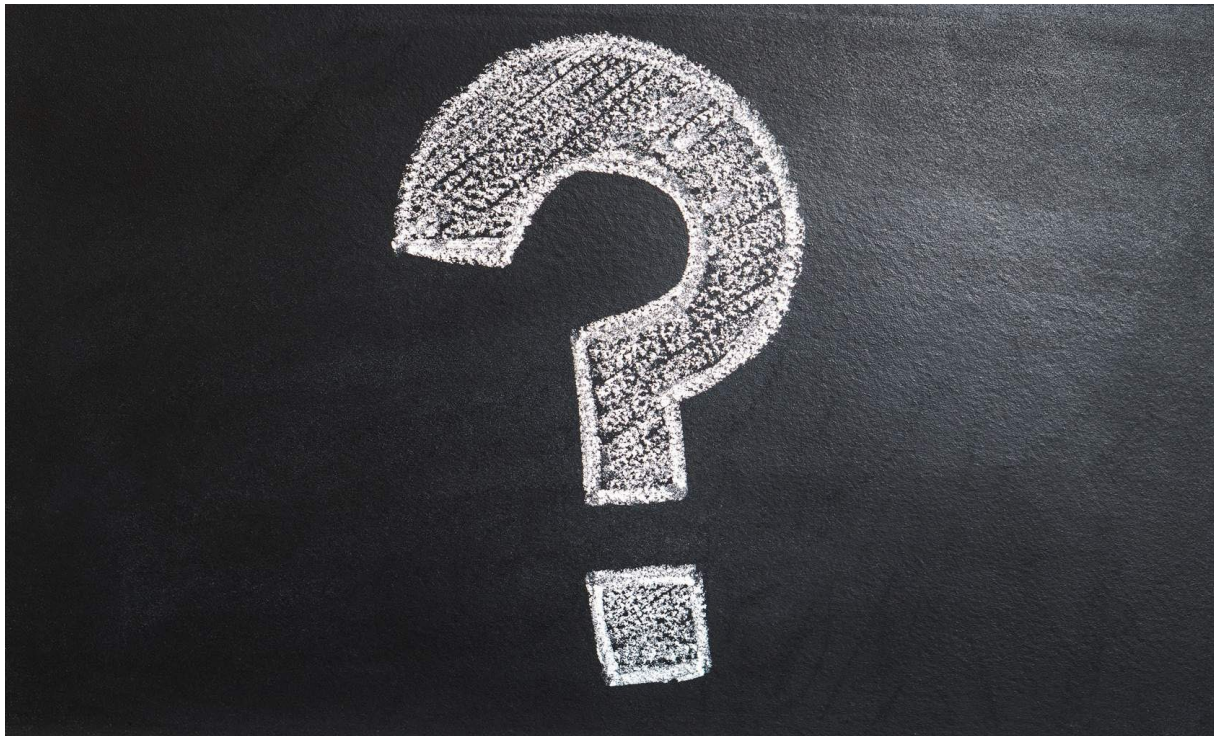


“What is the effectiveness of the influenza vaccine in older people?”

- This is a much more focused question that indicates the independent variable (vaccination status) and dependent variable (incidence of influenza).
- 

In addition to being clear and focused, review questions must be novel. Questions can be novel in terms of the type of question asked, the population examined, or the recency of the reviewed evidence (e.g., studies published in the last five years). Researchers should also ensure that answering the question could significantly contribute to scientific knowledge.





## PICO

PICO (Population, Intervention, Control, and Outcome) is a useful heuristic for designing review questions with sufficient specificity. [MacMillan and colleagues \(2019\)](#) highlight that if reviewing the impact of breast screening on early breast cancer detection in women, the PICO might look like this (hover over the letters to see more details):



Interactive element available in online version of the material.

Sometimes, the review's focus does not neatly fit into PICO. For example, the 'I' may be better exchanged for 'E', meaning 'exposure', especially if reviewing epidemiological or qualitative research ([Purssell & McCrae, 2020](#)).

## PICOS

If reviewing studies with specific research designs, researchers may use PICOS, an extension of the PICO framework, with the 'S' indicating 'study design'. For example, [Purssell and McCrae \(2020\)](#) state that if reviewing RCTs that assessed the impact of morphine plus ibuprofen versus morphine only on pain in postsurgical patients, the PICOS might look like this (hover over the letters to see more details):



Interactive element available in online version of the material.

The PICO/PICOS frameworks are also useful when developing terms for the comprehensive literature search in a systematic review.

## Creating a Systematic Review Protocol

“Systematic reviews should build on a protocol that describes the rationale, hypothesis, and planned methods of the review; few reviews report whether a protocol exists. Detailed, well-described protocols can facilitate the understanding and appraisal of the review methods, as well as the detection of modifications to methods and selective reporting in completed reviews.” (Moher et al., 2015)

A protocol is an explicit plan for a systematic review. The protocol outlines the rationale for the review and the methodological and analytical approach at the outset. Preparing a protocol is essential; it ensures careful planning and encourages ethical and best practice conduct by the research team such as accountability, integrity, and transparency. Some examples of what a protocol should contain include:



## Search Strategy —

A draft of the search strategy for at least one electronic database, such that it could be repeated.

## Data Management —

A description of the mechanism(s) that will be used to manage records and data throughout the review.

### **Risk of Bias Assessment** —

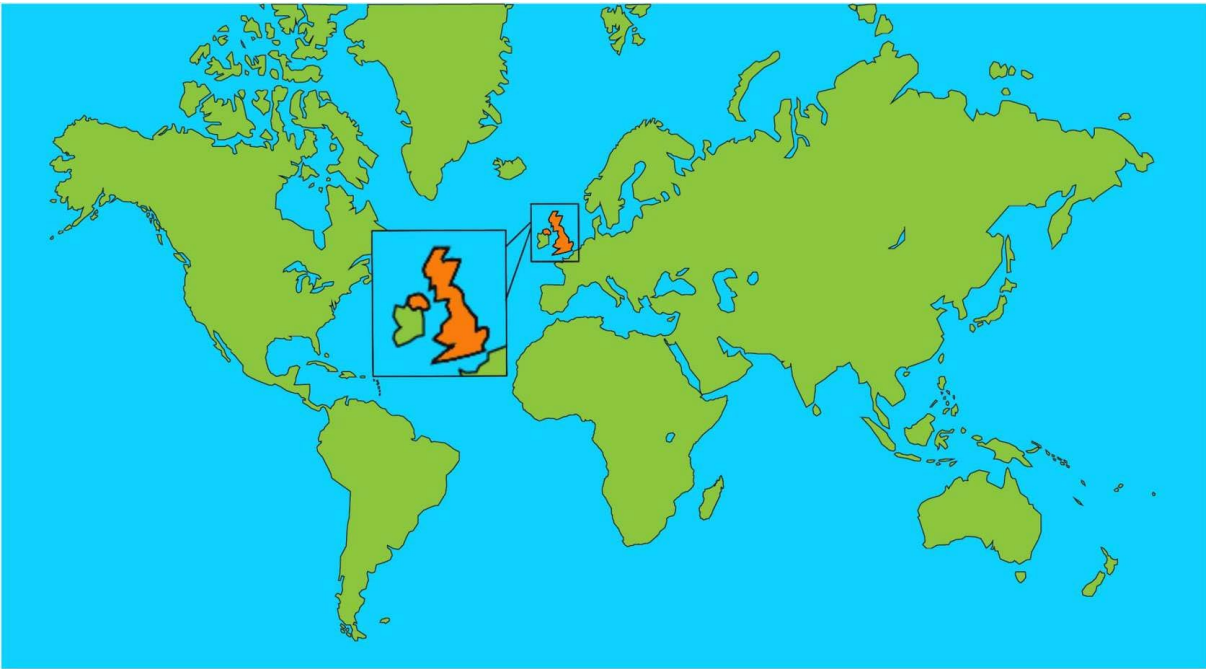
An outline of the methods for assessing the risk of bias of reviewed studies, including whether this will be done at the study or outcome level, or both. It should be stated how this information will be used in data synthesis.

### **Meta-Bias(es)** —

Specify if and how meta-bias(es) (e.g., publication bias across studies, selective reporting within studies) will be assessed.

When preparing protocols, it is advisable to closely follow the [PRISMA-P](#) (Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols) guidelines, which were developed as an extension of the PRISMA guidelines, which will be discussed later in this week's content.





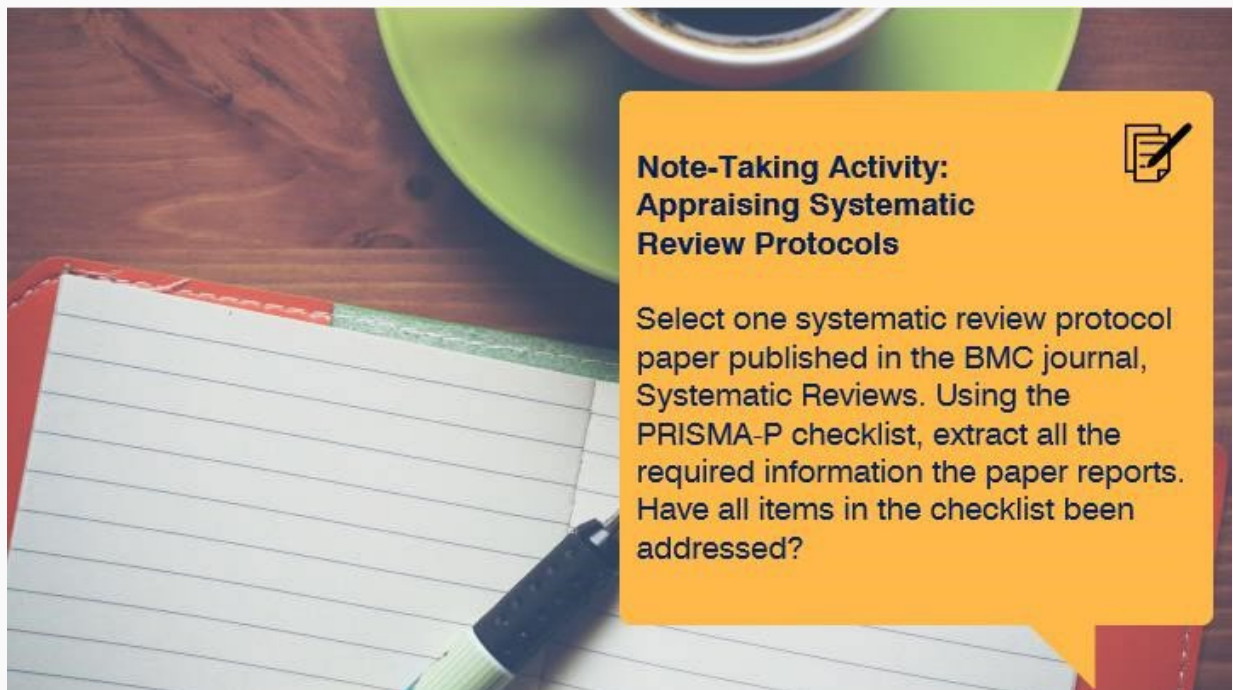
World map with UK highlighted

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In the UK, protocols are commonly registered on [PROSPERO](#), an online portal where researchers record their intention to undertake a given health-related systematic review before beginning. PROSPERO aims to prevent unplanned duplication of reviews and enables readers to see if the methods of completed reviews differed from the original plan, allowing assessments of whether changes could have impacted results.

## Appraising Systematic Review Protocols

A range of systematic review protocol papers are published in the BMC journal, [Systematic Reviews](#). As highlighted above it is wise to follow the [PRISMA-P checklist](#) when preparing protocols.



Alt text –

Note-Taking Activity: Appraising Systematic Review Protocols

- Select one systematic review protocol paper published in the BMC journal, Systematic Reviews. Using the PRISMA-P checklist, extract all the required information the paper reports. Have all items in the checklist been addressed?

## The Systematic Review Roadmap: The PRISMA Guidelines

Planning, undertaking, and writing up a systematic review is a multi-stage process that can be overwhelming without a framework or roadmap to follow. To help researchers navigate this journey (and ensure rigorous, transparent reporting of the rationale, methods, and findings of systematic reviews), the PRISMA guidelines were developed in 2009.





A 2020 update provided new guidance for reporting the identification, selection, critical appraisal, and synthesis of studies reviewed. The PRISMA 2020 guidelines include a 27-item checklist (with expanded checklists for each item), an abstract checklist, and flow diagrams for reporting literature search and screening results ([Page et al., 2021](#)).

Familiarise yourself with the main components of the [PRISMA 2020 checklist](#), and keep these in mind as you progress through this week, which broadly follows the activities necessary to complete a systematic review.

This might be a good time to take a break if you haven't already done so.



**REFERENCE LIST What Makes a Literature Review  
Systematic.docx**

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### What Makes a Literature Review 'Systematic' and Getting Started

Hammersley, M. (2013). Systematic or Unsystematic, Is That the Question? Some Reflections on the Science, Art and Politics of Reviewing. In 'The Myth of Research-Based Policy & Practice', Martyn Hammersley (Ed.), Sage Publications.

MacMillan, F., McBride, K. A., George, E. S., & Steiner, G. Z. (2019). Conducting a Systematic Review: A Practical Guide. In 'Handbook of Research Methods in Health Social Sciences', Pranee Liamputtong (Ed.). Western Sydney University. Singapore: Springer, 805-826.

Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., ... & Stewart, L. A. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic reviews*, 4(1), 1-9. (open access)

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 372: n71. (open access)

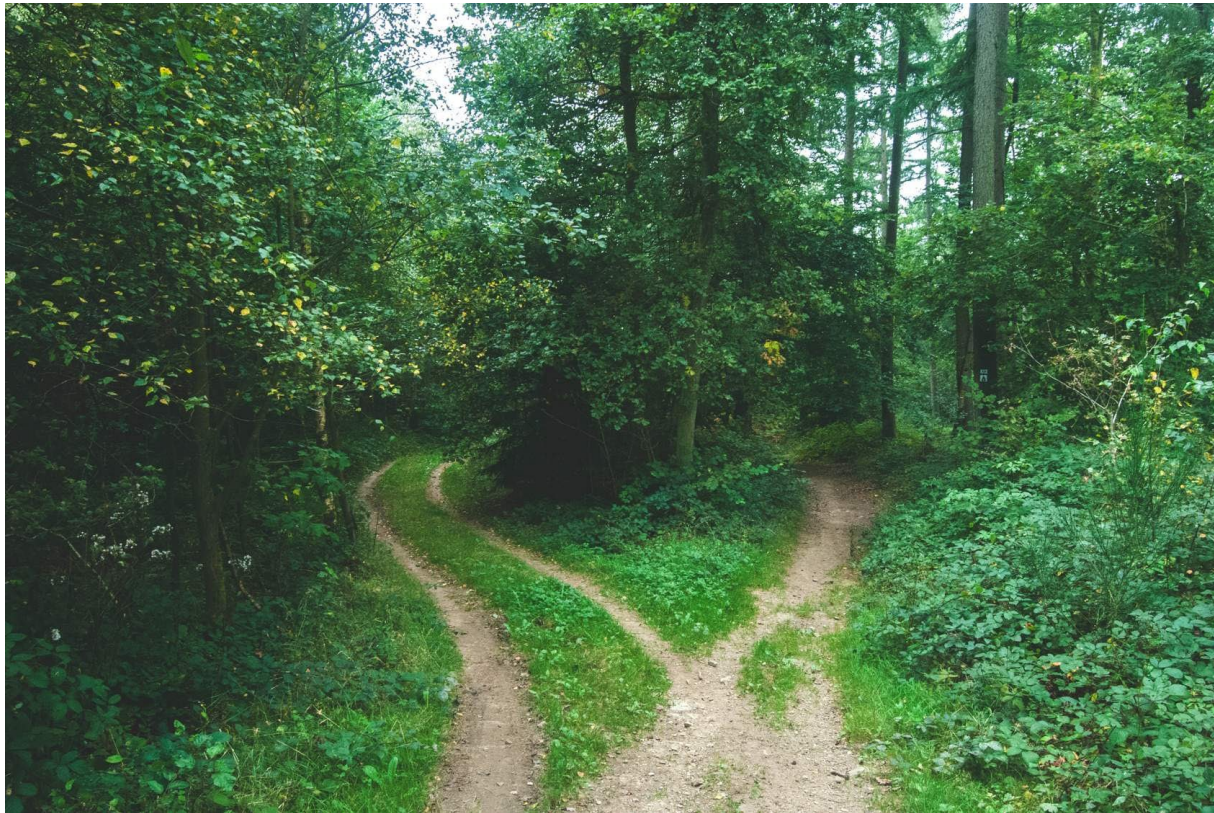
Purssell, E., & McCrae, N. (2020). How to perform a systematic literature review: A guide for healthcare researchers, practitioners and students. Springer Nature.



# Is a Systematic Review Right for My Project? Comparing Review Types

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This section explores the differences between systematic reviews and other review types such as scoping, narrative, and critical reviews. The materials presented aim to help learners make informed decisions about the most appropriate review type to undertake.



Beyond systematic reviews, there are many other approaches to reviewing the literature. They are used for distinct purposes and circumstances, especially when systematic reviews are inappropriate for the review aims or unfeasible due to time or other constraints.

[Grant and Booth \(2009\)](#) used a basic framework, denoted by the acronym 'SALSA', to examine and describe the different features of the most common review types (hover over each letter):

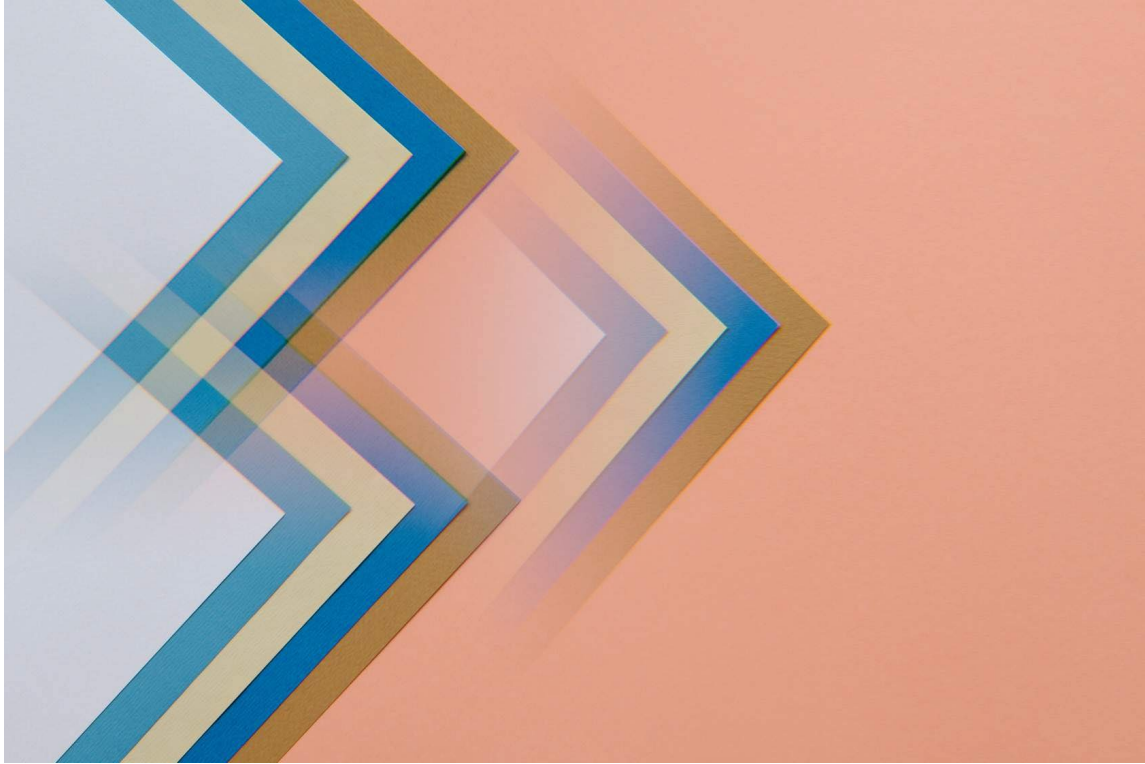


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Some of the review types discussed by [Grant and Booth \(2009\)](#) are shown in the graphic below, although it is important to note that there are others.



## Narrative, Critical, and Scoping Reviews



More detail is provided here about three review types: narrative, critical, and scoping.

## Narrative Reviews (or Simply, 'Literature Reviews')



'Narrative' is a generic term, usually referring to a review that thematically and broadly overviews findings on a particular research topic. Unlike systematic reviews, narrative reviews are not protocol-based, and they may not follow rigid eligibility criteria. Instead, they typically rely on the researchers' subjective knowledge and interests. They review a non-exhaustive range of relevant studies and may not utilise systematic search strategies, thereby increasing the chance of selection bias ([MacMillan et al., 2019](#)).

Although narrative reviews vary in comprehensiveness and systematicity, systematic reviews are generally more structured and employ a greater range of methods to increase rigour and minimise bias (i.e., having multiple reviewers screen studies).



## Critical Reviews



Critical reviews use non-exhaustive literature searches to identify and appraise the most significant sources related to the review objectives. They are especially useful for generating critique and hypotheses and identifying empirical or conceptual gaps and future research directions. They do not generally involve a systematic quality appraisal; sources are evaluated based on relevance and contribution to the debate or problem. They often include diverse sources, including qualitative and theoretical works.

Critical reviews usually lack the systematicity of some other review types and can be criticised for being subjective and incomplete. Nevertheless, they are extremely useful for advancing research and theory. [Karadzhov \(2021\)](#) is an example of a critical review.

## Scoping Reviews



Scoping reviews characterise the nature, diversity, and size of research areas, especially those that are rapidly evolving. Their design is flexible based on the reviewers' time and resources; the search completeness depends on those factors.

The [PRISMA Extension for Scoping Reviews \(PRISMA-ScR\)](#) states that, in contrast to systematic reviews, scoping reviews aim to summarise the evidence base regardless of quality or bias. Quality assessment is, therefore, optional and not typically conducted, although some authors systematically consider source type (e.g., quantitative or qualitative, empirical or non-empirical). Rigorous scoping reviews are transparent, replicable, and can indicate the need for a systematic review. However,

their lack of quality assessment makes them less systematic and objective.

[Yimgang and colleagues \(2021\)](#) is an example of a scoping review.

## **A Systematic Review or a Scoping Review?**

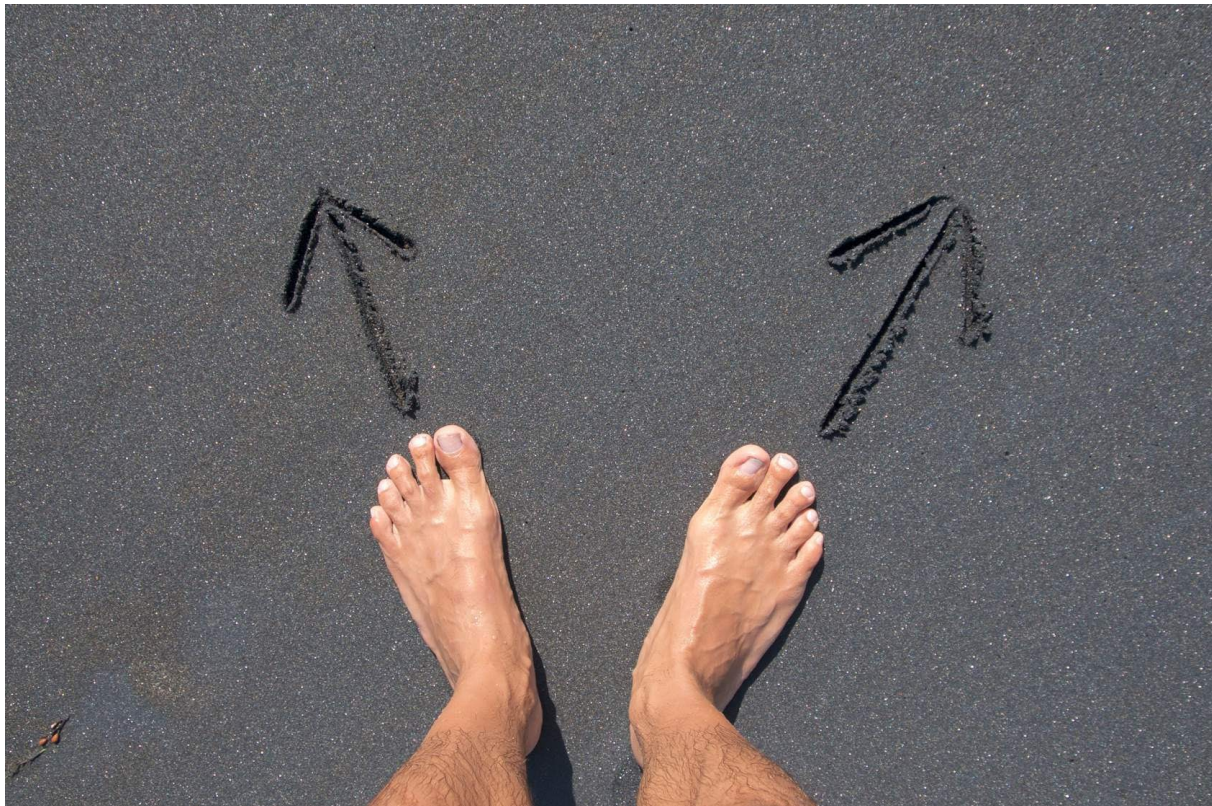
Systematic reviews are widely considered the cornerstone of evidence-based health care in that they aim to produce reliable and meaningful findings to guide practitioners, policymakers, and other decision-makers.



In contrast, scoping reviews "do not aim to produce a critically appraised and synthesised result/answer to a particular question and rather aim to provide an overview or map of the evidence." ([Munn et al., 2018](#)). Because scoping reviews usually lack a risk of bias assessment, their findings are less translatable to clinical practice and health policy.

[Munn and colleagues \(2018\)](#) discuss when systematic reviews are more appropriate than scoping reviews, and vice versa. Examine the table below, which summarises when each approach is indicated:





#### SYSTEMATIC REVIEWS

#### SCOPING REVIEWS

When the aim is to:

- Uncover international evidence.
- Confirm current practice/address any variation/identify new practices.
- Identify and inform future research areas.
- Identify and investigate conflicting results.
- Produce statements to guide decision-making.

When the aim is to:

- Identify the types of available evidence in a field.
- Clarify key concepts/definitions in the literature (e.g., personal recovery).
- Examine how research has been conducted on a certain topic (e.g., the range of tools used to measure hip replacement wear).
- Identify and analyse knowledge gaps
- Identify key characteristics related to a concept.
- Be a precursor to a systematic review (e.g., by developing inclusion and exclusion criteria so future systematic reviews are feasible and can use evidence effectively).

## Comparing Narrative, Scoping, and Systematic Reviews

[Munn and colleagues \(2018\)](#) present a summary table comparing the defining characteristics of traditional literature (narrative), scoping, and systematic reviews:

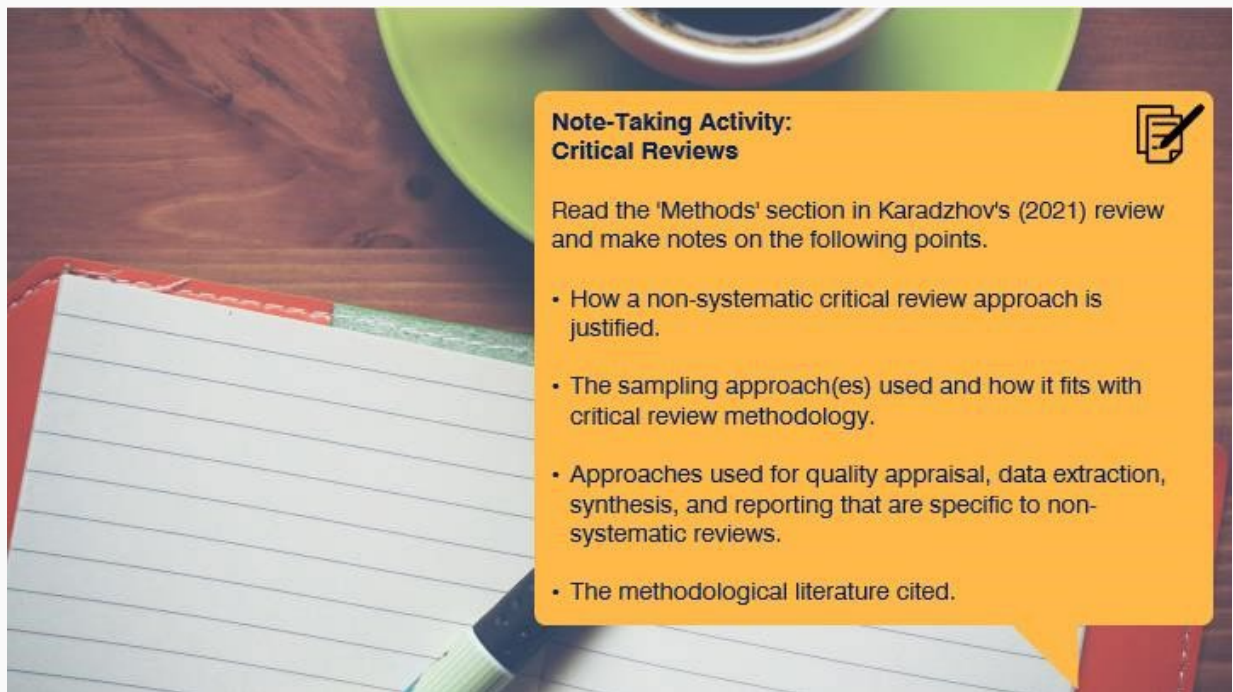


	<b>Traditional Literature Reviews</b>	<b>Scoping Reviews</b>	<b>Systematic Reviews</b>
A priori review protocol	No	Yes (some)	Yes
PROSPERO registration of the review protocol	No	No	Yes
Explicit, transparent, peer reviewed search strategy	No	Yes	Yes
Standardised data extraction forms	No	Yes	Yes
Mandatory critical appraisal (risk of bias assessment)	No	No	Yes
Synthesis of findings from individual studies and generation of summary findings using meta-analysis or meta-synthesis (synthesis of data from qualitative studies)*	No	No	Yes

\*Not all systematic reviews of quantitative data perform a meta-analysis.

## Critical Reviews

[Karadzhov \(2021\)](#) presents a critical conceptual review about personal recovery and socio-structural disadvantage.



**Note-Taking Activity:  
Critical Reviews**

Read the 'Methods' section in Karadzhov's (2021) review and make notes on the following points.

- How a non-systematic critical review approach is justified.
- The sampling approach(es) used and how it fits with critical review methodology.
- Approaches used for quality appraisal, data extraction, synthesis, and reporting that are specific to non-systematic reviews.
- The methodological literature cited.

### Note-Taking Activity: Critical Reviews -

Read the 'Methods' section in Karadzhov's (2021) review and make notes on the following points.

- How a non-systematic critical review approach is justified.
- The sampling approach(es) used and how it fits with critical review methodology.
- Approaches used for quality appraisal, data extraction, synthesis, and reporting that are specific to non-systematic reviews.
- The methodological literature cited.

## Good Practice Tip

If you are planning to carry out a literature review, you should:

- Justify why the chosen review type is appropriate to address the research question.
- Be aware of, and critique, published reviews on similar topics, highlighting how your review will significantly advance knowledge in the field.
- Critically assess the strengths and weaknesses of the chosen review approach and how this impacts the completeness and integrity of the findings.



**REFERENCE LIST Is a Systematic Review Right for My Project.docx**

13.8 KB



## **Is a Systematic Review Right for My Project? Comparing Review Types**

Grant, M. J., & Booth, A. (2009). A typology of reviews: an analysis of 14 review types and associated methodologies. *Health information & libraries journal*, 26(2), 91-108. (open access)

Karadzhov, D. (2021). Personal recovery and socio-structural disadvantage: a critical conceptual review. *Health*, 13634593211014250. (open access)

MacMillan, F., McBride, K. A., George, E. S., & Steiner, G. Z. (2019). Conducting a Systematic Review: A Practical Guide. In 'Handbook of Research Methods in Health Social Sciences', Pranee Liamputtong (Ed.). Western Sydney University. Singapore: Springer, 805-826.

Munn, Z., Peters, M. D., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC medical research methodology*, 18(1), 1-7. (open access)

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., ... & Straus, S. E. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Annals of internal medicine*, 169(7), 467-473. (open access)

Yimgang, D., Danhondo, G., Kusi-Appiah, E., Sunder, V., Campbell, S., & Yaya, S. (2021). A scoping review of researchers' involvement in health policy dialogue in Africa. *Systematic Reviews*, 10(1), 1-12. (open access)

# Key Stages: Search, Screening, Extraction, Appraisal and Synthesis

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The main stages in the systematic review – literature search, data extraction, quality assessment, and synthesis and interpretation – are presented. Best practices in searching and screening sources are shared. Learners are also acquainted with tools for appraising individual studies.

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## 1

This is an opportunity to become familiar with, or refresh your knowledge of, these key terms related to literature searches ([Purssell & McCrae, 2020](#)). Click on the 'i' icon to get started.



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**Bibliographic Database** - An organised collection of published literature, often specialised (e.g., medicine). Databases include Medline/PubMed, Embase, and PsycInfo

**Keywords** - Terms that describe the topic the reviewer is interested in and that are likely to be used in the titles and abstracts of relevant studies.

**MeSH** - Medical Subject Headings (as used in PubMed database). These are headings under which papers have been indexed by experts based on their content. The headings/index terms differ by database.

**Boolean Operator** - A word used to connect terms in a search string or exclude them from the search (e.g., AND, OR, NOT).

**Limiter** - Also called 'filters', 'limits' or 'delimiters'. Options that limit the overall scope of the search. For example, one may wish to restrict the search by publication date, source type, language, or other filters. Caution should be exercised when using limiters, however, as their overuse can considerably restrict the studies available for review.

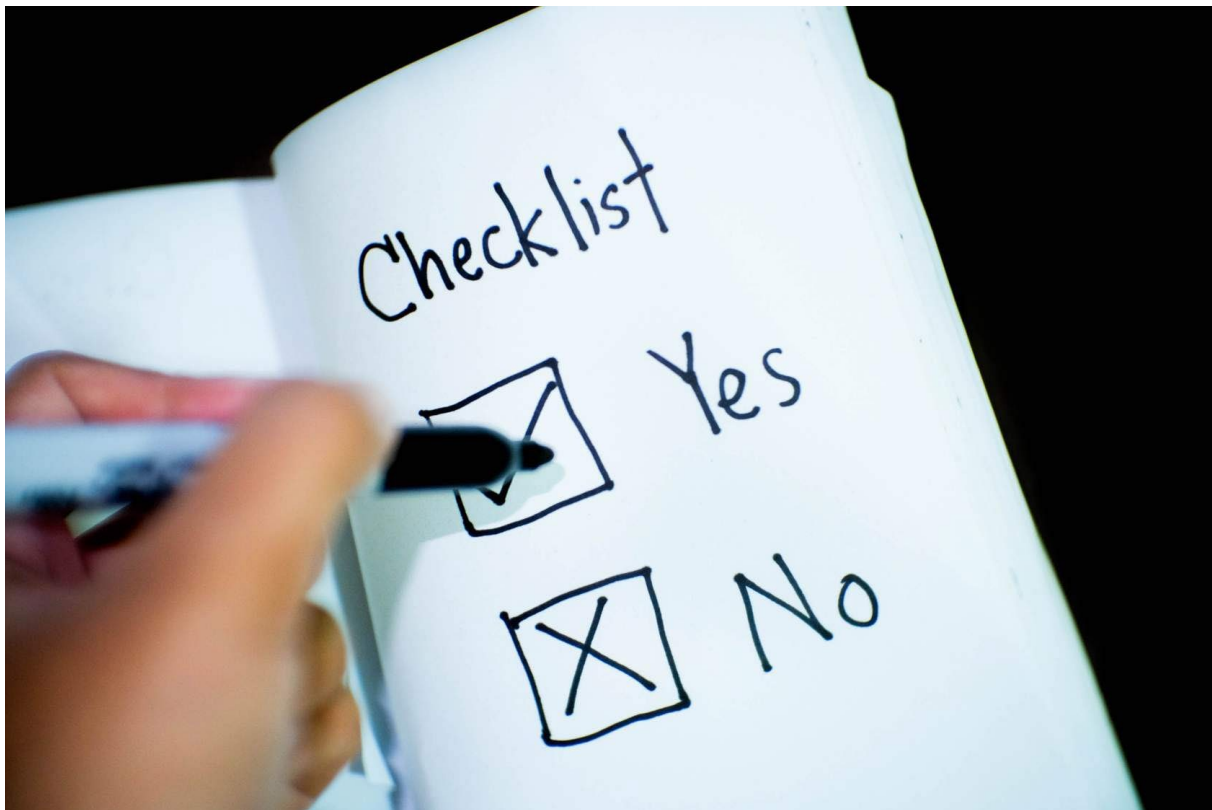
**Search String** – The combination of keywords, MeSH terms, Boolean operators, and delimiters that together form the content entered into database search bars.

**Grey Literature** - Reports that are not published in peer-reviewed journals and thus not indexed in scientific databases. Examples include policy documents, survey reports by voluntary organisations, and scientific research not submitted to journals (for whatever reason).



## Developing Eligibility Criteria

Before undertaking a literature search, the researcher must be clear on what eligibility criteria individual studies must meet to be included in the systematic review. [Purssell and McCrae \(2020\)](#) remind us that eligibility criteria:



- Must logically follow the review question.
- Must be as concise as possible to limit the scope of the review.
- Must be decided before the review commences.

- Should be adhered to after the review starts. Removing eligible studies often introduces bias and is like a researcher randomly eliminating participants from analysis.

## Case Study: Dementia Experiences

The following eligibility criteria could be applied to a review of dementia experiences.



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Inclusion Criteria

Dementia

Adults aged 65+

Experiences of people with dementia

Empirical studies wholly or partly qualitative



Exclusion Criteria

Korsakoff syndrome

Inclusion Criteria:

Dementia, Adults aged 65+ , Experiences of people with dementia, Empirical studies wholly or partly qualitative

Exclusion Criteria:

Korsakoff syndrome

Exclusion criteria that do not add new information are considered redundant and advised against. For example:



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#### Inclusion Criteria

Dementia

Adults aged 65+

Experiences of people with dementia

Empirical studies

Qualitative/mixed methods

In English



#### Exclusion Criteria

Conditions other than dementia

Adults aged <65, children

Not studying the experiences of people with dementia

Reviews, commentaries, policy documents

Quantitative methods with no qualitative data

Not in English

#### Inclusion Criteria:

Dementia, Adults aged 65+, Experiences of people with dementia, Empirical studies, Qualitative/mixed methods, In English.

#### Exclusion Criteria:

Conditions other than dementia, Adults aged <65, Children, Not studying the experiences of people with dementia, Reviews, commentaries, policy documents, Quantitative methods with no qualitative data, Not in English.

## Modifying the Eligibility Criteria



Reviewers may amend their initial eligibility criteria during or after their scoping search ([Purssell & McCrae, 2020](#)). A scoping search is a brief database search to determine how much research exists on the topic the reviewer wishes to explore. If a very large body of relevant literature is encountered, the reviewer may narrow the scope of the review. However, there must be a strong scientific rationale for modifications other than convenience. Changes should be documented and justified.

# A Systematic Review into Non-Pharmacological Dementia Interventions (4 minutes)

Paula Cairns, an MSc Global Mental Health alumna, describes how she tackled her systematic review looking at non-pharmacological interventions for people with dementia living in long-term care.

Please note: Video content is not available in this offline version of material. To view the video please access the online version.



Paula Cairns is currently working as a Graduate Teaching Assistant on the MSc Global Mental Health course, as well as working with SAMH to support people who are living with mental illness.

## Searching the Literature

A background image of a library with rows of bookshelves filled with books. The shelves are white, and the books have various colored spines. The lighting is soft and even.

### Good Practice Tip

Searching for literature can feel complicated and daunting at first. Librarians are invaluable in any major research project and should be consulted when carrying out a systematic review to optimise the search strategy. It is valuable to familiarise yourself with database searching and contact your [College Librarian](#) with any queries.

## Search Techniques

Searches in systematic reviews often involve multiple techniques:



### Conventional Approach

Entails a comprehensive search of relevant bibliographic databases using appropriate keywords, search strings, MeSH terms, Boolean operators, and delimiters.

### Supplementary Techniques

Includes contacting experts and pearl growing, also known as snowballing or citation mining. Pearl growing involves identifying a relevant source, searching its reference list for further sources, then searching the

## Search Sources

The search strategy in a systematic review usually involves multiple electronic databases. Databases are chosen based on the focus of the

review. Examples include MEDLINE/PubMed, Embase, PsycINFO, CINAHL, AMED, among others. Databases by subject can be searched [here](#). It is important to understand the scope, functions, strengths, and limitations of each database. For example:



- What limits and filters can be applied?
- How are Boolean operators utilised?
- What indexing system is used?

# Google Scholar

Google Scholar should not be the sole electronic database searched due to the high likelihood of retrieving a vast number of irrelevant sources of variable quality. Search strategies are also not as replicable as those run on the aforementioned databases. Moreover, newly published papers are not available as quickly on Google Scholar as they are in specialised databases such as PubMed.

Yet, Google Scholar's vast scope and lack of date, geographical, and language restrictions make it potentially useful for hand-searching, including citation and reference list searching.



# Recording the Search Strategy and Outputs

The search procedure and its outputs should be accurately and thoroughly reported. This demonstrates the methodological rigour and repeatability of the review, thereby strengthening confidence in its conclusions. The following information should be reported ([Purssell & McCrae, 2020](#)):

- All databases searched
- Dates each database was searched
- Any language/publication status restrictions
- Other data sources searched
- Any researchers/organisations contacted
- 'Hand-searching' of reference lists

A copy of the search strategy, including search strings, delimiters, and number of retrieved items, should be included in an appendix.

## Keeping a Bibliography

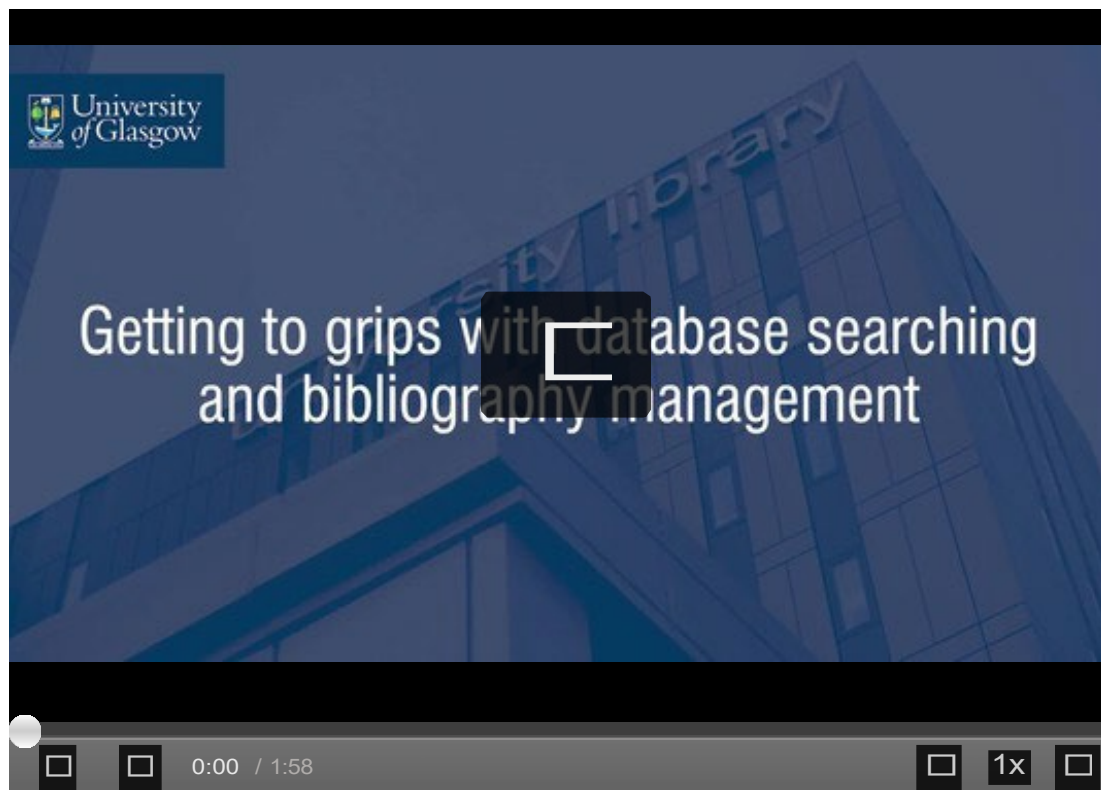


Bibliographies must be kept for every assignment and research project, but this is especially important in systematic reviews, which typically require the management of many sources. Start your bibliography as early as possible to avoid a heavy workload and errors at the end of the project.


Reference management tools enable researchers to create records for relevant literature. They are useful for managing search results and screening studies for eligibility. [EndNote](#) is a popular reference management tool and can be accessed via your University account. Other options include Mendeley, RefWorks, and Zotero.

## Searching and Bibliography Management (2 minutes)

Ailsa Frew outlines the value in prioritising getting familiar as early as possible with valuable tools for searching and organising the literature.







## Good Practice Tip

**Set aside time to explore the basic features of EndNote or a similar package. Get into the habit of engaging with these tools for all assignments. In time, they will likely become the natural choice for any research you undertake.**

## Screening Sources for Eligibility

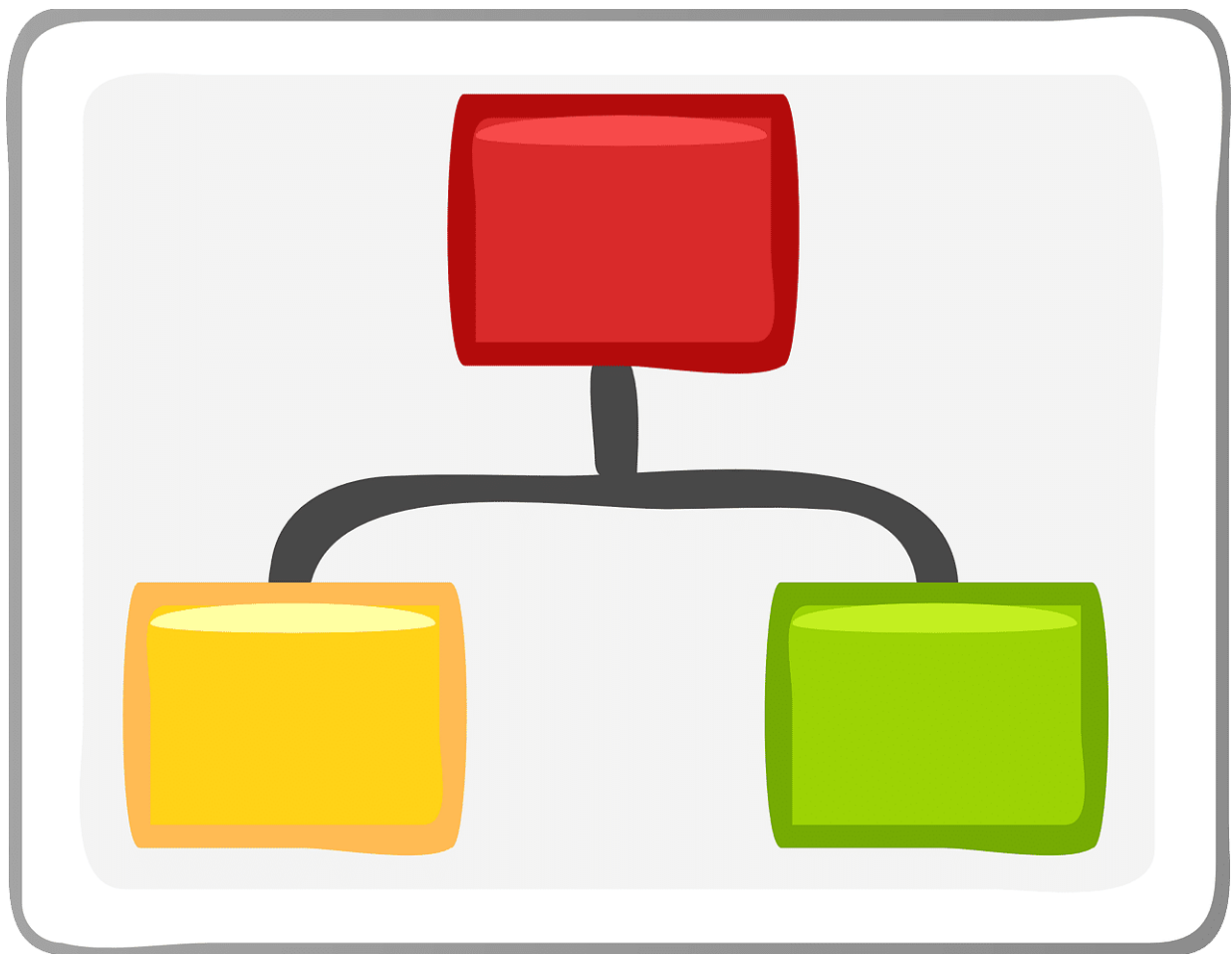
In systematic reviews, screening is the methodical process of briefly assessing whether sources identified during the literature search meet the eligibility criteria. The initial stage usually involves reading the titles and/or abstracts to judge whether to progress the study to the next, full-text screening phase or exclude the study from the review altogether.



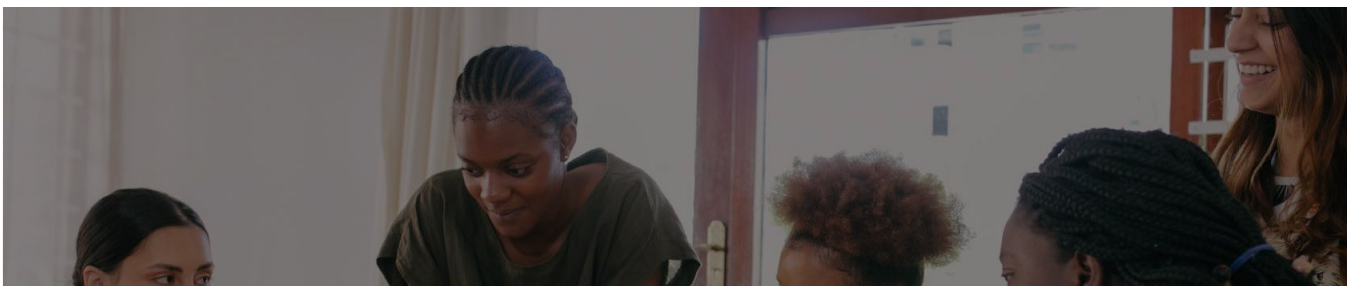
A well-planned screening approach ensures that no potentially useful sources are excluded prematurely, while reducing the number of irrelevant sources examined in the later, more time-consuming stages - full-text screening, data extraction, and critical appraisal. The rigour of the screening process considerably affects the overall quality of the review.

## The PRISMA 2020 Flow Diagram

The PRISMA 2020 guidelines provide [flow diagram templates](#), which should be used in systematic review reports to visualise the literature search and screening procedures and results. Editable templates, which you should use if you intend to conduct a systematic review, can be downloaded from the [PRISMA website](#).



Examine the templates and pay attention to how the 'records screened' (i.e., number of sources whose titles and abstracts were screened) and the 'reports assessed for eligibility' (i.e. full-text screening) are typically reported. Note that it is customary to report reasons for exclusion during the full-text screening, but not during the title and abstract screening phase.



# Good Practice: Screening Sources

Click on each of the icons to find out more.



Interactive element available in online version of the material.

## Report Number of Reviewers -

Report how many reviewers screened each record and whether they worked independently.

## Specify Amendments -

Report whether the eligibility criteria, or other parts of the protocol, were amended during screening.

## Describe Tools Used -

State whether an abstract screening tool was used. If so, how was it organised (e.g., was the easiest/most obvious question at the beginning to streamline the process)?

## Keep if Uncertain -

If unsure about whether a study should be excluded, include it.

## Be Transparent About Disagreements-

Report how disagreements were resolved and whether any software was used to automate the process. If appropriate, report the agreement percentage for multiple reviewers.

## Record Exclusion Reasons –

Meticulously record the reasons for excluding studies at the full-text screening phase. Keep a record of excluded studies.




## Data Extraction




Once the literature search is finalised and all eligible studies have been identified, all relevant data need to be extracted from each study. It is important to use a consistent approach when extracting data. Doing so demonstrates systematicity and aids study comparisons and the identification of evidence gaps. It also shows the researcher has a thorough knowledge of each reviewed study.

## Data Extraction Form

Using a data extraction form can help maintain consistency. A sample form by [Booth and colleagues \(2016\)](#) is attached. Some literature review software packages allow reviewers to customise their data extraction templates.

 **Booth et al. (2012) Sample Data Extraction Forms.pdf**  
74.8 KB



## Literature Review Software

Software packages can assist with data extraction, analysis, and synthesis. Please note that you are not expected to learn how to use all of these software packages. However, you may find some of the below examples useful, depending on the type of research project you undertake:

NVIVO	REVMAN	COVIDENCE	EPPI-REVIEWER

- 
-

[NVivo](#) is a qualitative data analysis software package that can assist with:

Importing sources as pdf files from a PC or bibliographic software such as EndNote

Sifting and refining information sources

Making annotations

Performing qualitative data analysis

Text searching the entire dataset.

Chapter 8 in [Jackson and Bazeley\\_\(2019\)](#) offers detailed guidance for using NVivo.

Note: An NVivo student licence is freely available via the [University IT Services](#).

NVIVO

REVMAN

COVIDENCE

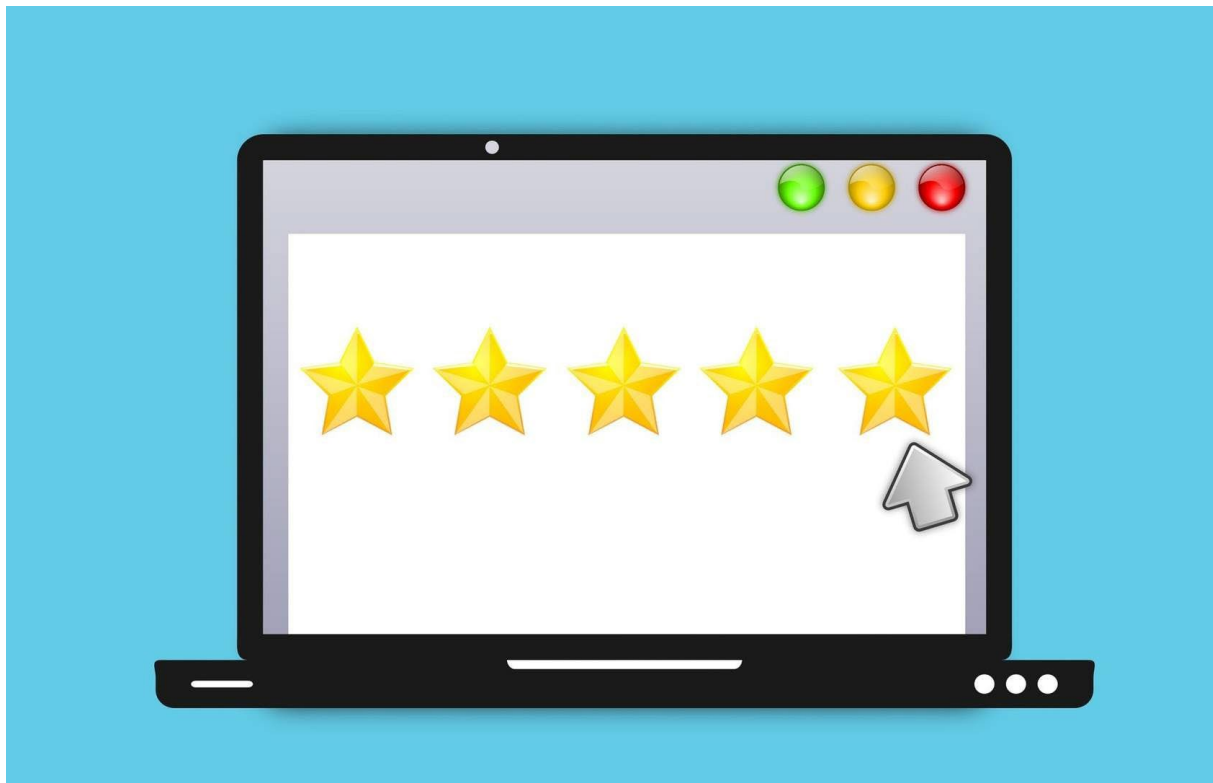
EPPI-REVIEWER

[Cochrane Review Manager \(or RevMan\)](#) is the Cochrane Collaboration's software for preparing and maintaining Cochrane reviews. RevMan helps prepare protocols and full reviews. It can also assist with conducting a meta-analysis, which is a statistical method for combining the results of quantitative studies. Cochrane, previously known as the Cochrane Collaboration, is an international, independent network of researchers and practitioners aiming to enhance evidence-based healthcare.

NVIVO	RE VMAN	COVIDE NCE	EPPI-REVIE WER
<p><a href="#">Covidence</a> assists with uploading search results; removing duplicates; screening titles, abstracts, and full texts; conducting risk of bias assessments; and other integral functions.</p>			
NVIVO	RE VMAN	COVIDE NCE	EPPI-REVIE WER
<p><a href="#">EPPI-Reviewer</a> performs similar functions to Covidence.</p>			

## Appraising the Studies

For systematic reviews to make justifiable claims, it is important to appraise the quality and relevance of the individual studies included. Procedures for critically appraising the methodological quality of individual pieces of research will be explored in detail later in this course. However, you should be aware that multiple tools exist to aid the assessment of the quality of individual studies when conducting a systematic review. Different tools are available depending on the design of the study to be appraised. Examples include:



The STROBE  
Statement

The STROBE  
(Strengthening the  
Reporting of Observational

The CONSORT  
(Consolidated Standards of



## The CONSORT Statement

Reporting Trials) statement includes a checklist and a flow diagram to help researchers assess the reporting of experimental studies ([Schulz et al., 2010](#)).

## CASP

[CASP](#) (Critical Appraisal Skills Programme) has developed eight appraisal tools for various types of study design.

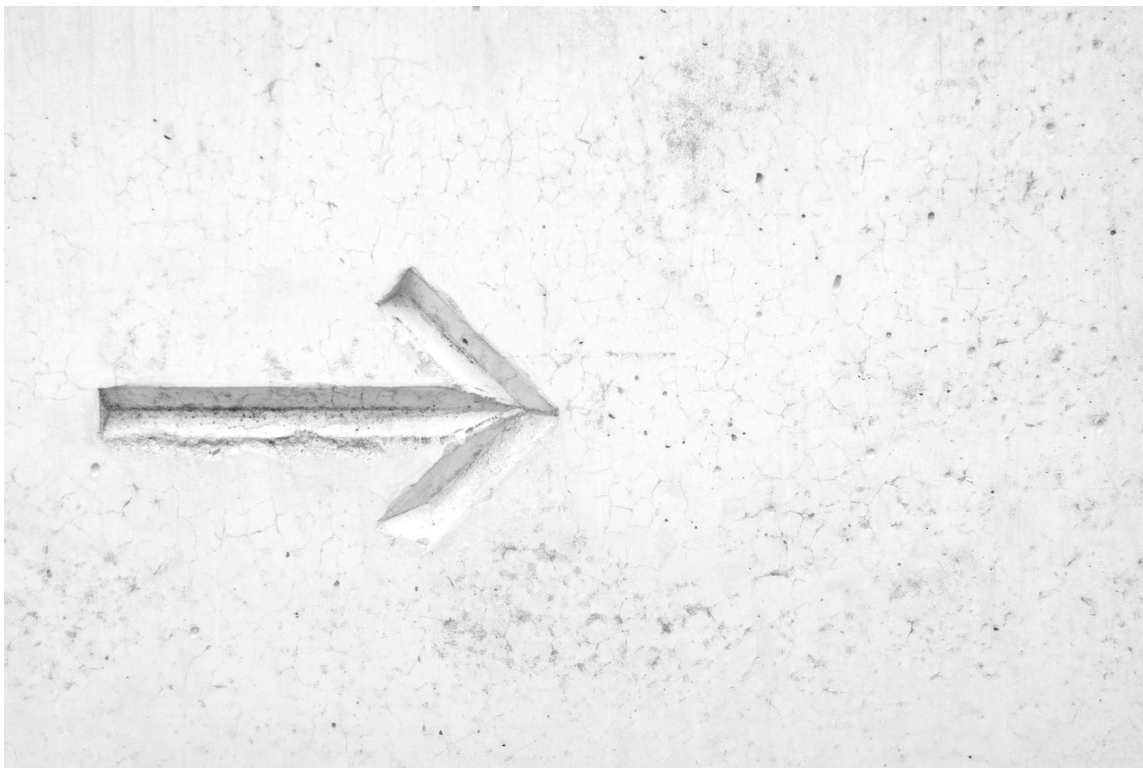
## A Systematic Review into Postnatal Depression and Suicide (4 minutes)

Ailsa Frew, an MSc Global Mental Health alumna, describes the processes she worked through to complete her systematic review on postnatal depression and suicide.



Ailsa Frew is a global mental health alumni and is currently working as a graduate teaching assistant to support the development of the online learning materials.

## Synthesising and Making Sense of the Evidence



The next step is to synthesise the findings of the individual studies and interpret the evidence. The synthesis can be quantitative (e.g., a meta-analysis) or narrative (e.g., descriptive; [MacMillan et al., 2019](#)). If the reviewed studies are highly heterogeneous, or the review has a broad scope, a narrative synthesis is preferable. Narrative syntheses have no universal guiding framework, but some best practice advice is offered below.

## Create Overview Tables



A table containing key information about all the studies, including their titles and authors, aims, intervention and control groups, and statistically significant results, among others, should be included ([Purssell & McCrae, 2020](#)). The table may also include the quality assessment outcomes for each study.

Tables should first be compiled on a spreadsheet and then inserted into the report. Tables containing a high level of detail can be added to an Appendix.

## Consider the Quality and Quantity of Individual Findings



If reviewing intervention studies, for example, the studies reporting beneficial effects should be contrasted with those that do not. The risk of bias identified in each study should also be considered. For instance, high-quality studies could be discussed separately from low-quality studies.

Outliers should be examined carefully – are there studies with extremely positive or negative results?



## Consider the Bigger Picture

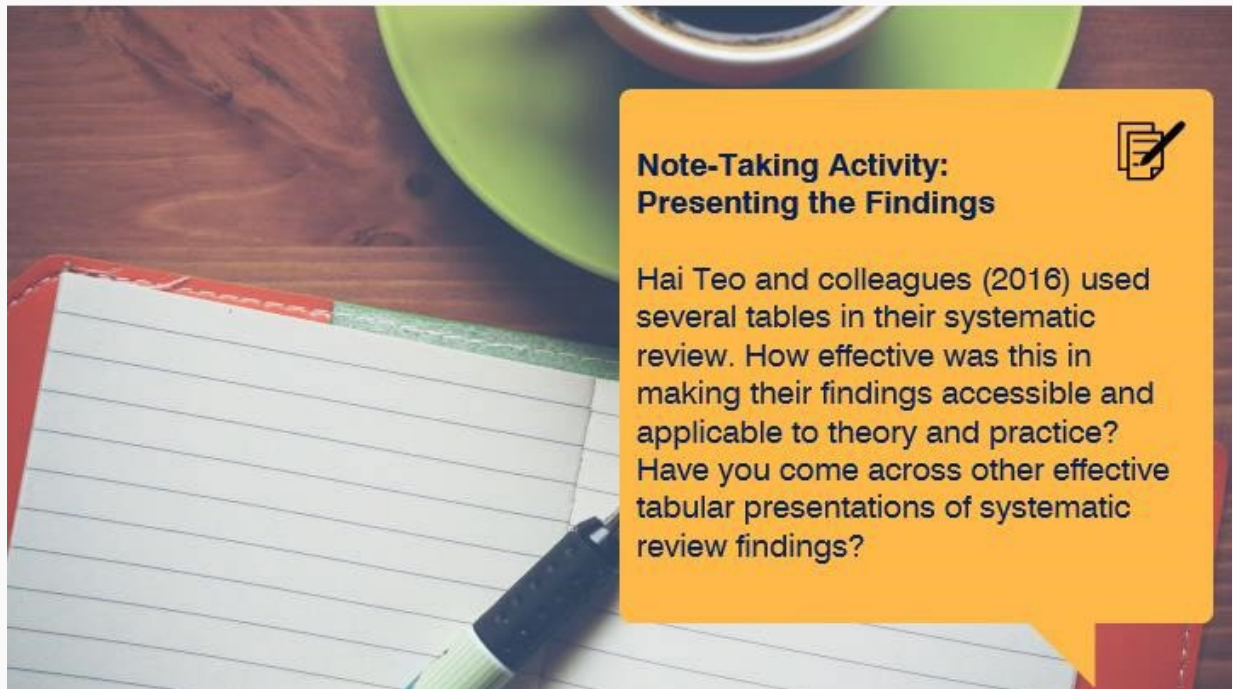


The FORM framework can be used to structure the synthesis and articulate recommendations for clinical practice ([Hillier et al., 2011](#)). FORM considers the quality and quantity of the evidence, consistency of results across studies, impact on the target population, and generalisability and applicability of the findings.

The review should conclude with a clear statement about what is known about the topic, how this relates to practice, what remains unknown, and what questions future research should address.

## Presenting Systematic Review Findings

[Hai Teo and colleagues \(2016\)](#) completed a systematic review considering facilitators and barriers for men's engagement with health screening.



### Note-Taking Activity: Presenting the Findings

- Hai Teo and colleagues (2016) used several tables in their systematic review. How effective was this in making their findings accessible and applicable to theory and practice? Have you come across other effective tabular presentations of systematic review findings?

This might be a good time to take a break if you haven't already done so.

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**REFERENCE LIST Key Stages.docx**

14.3 KB



### **Key Stages: Search, Screening, Extraction, Appraisal and Synthesis**

Booth, A., Sutton, A., & Papaioannou, D. (2016). *Systematic Approaches to a Successful Literature Review*. Sage Publications.

CASP checklists. <https://casp-uk.net/casp-tools-checklists/> (open access)

Hillier, S., Grimmer-Somers, K., Merlin, T., Middleton, P., Salisbury, J., Tooher, R., & Weston, A. (2011). FORM: an Australian method for formulating and grading recommendations in evidence-based clinical guidelines. *BMC medical research methodology*, 11(1), 1-8. (open access)

Jackson, K., & Bazeley, P. (2019). *Qualitative data analysis with NVivo*. Sage.

MacMillan, F., McBride, K. A., George, E. S., & Steiner, G. Z. (2019). Conducting a Systematic Review: A Practical Guide. In 'Handbook of Research Methods in Health Social Sciences', Pranee Liamputtong (Ed.). Western Sydney University. Singapore: Springer, 805-826.

Purssell, E., & McCrae, N. (2020). *How to perform a systematic literature review: A guide for healthcare researchers, practitioners and students*. Springer Nature.

Schulz, K.F., Altman, D.G., Moher, D. et al. CONSORT 2010 Statement: updated guidelines for reporting parallel group randomised trials. *BMC Med* 8, 18 (2010). (open access)

Teo, C. H., Ng, C. J., Booth, A., & White, A. (2016). Barriers and facilitators to health screening in men: a systematic review. *Social Science & Medicine*, 165, 168-176.

Von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., & Vandenbroucke, J. P. (2007). The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *Bulletin of the World Health Organization*, 85, 867-872. (open access)

# Appraising Systematic Reviews

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Learners are shown how to appraise the quality of systematic reviews and encouraged to critically reflect on their limitations more broadly.

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1

## Appraising Systematic Reviews

Although systematic reviews sit at the top of the evidence hierarchy, like any other type of study, they are susceptible to biases and caveats. When reading or conducting systematic reviews, it is important to be critical and reflective about how those limitations affect the credibility of the findings.

[Liabo and colleagues \(2017\)](#) recommend considering three dimensions when appraising systematic reviews (hover over each circle):



Interactive element available in online version of the material.

#### Evidence Produced –

The extent to which, in their totality, the included studies answer the review question should be assessed. Do they largely agree or contradict one another? Do their overall methodological quality allow the reviewer to confidently answer the review question?

#### Methods of Included Studies –

The methodological quality of the individual studies should be appraised, as well as their relevance to the review question.

#### Review Methods –

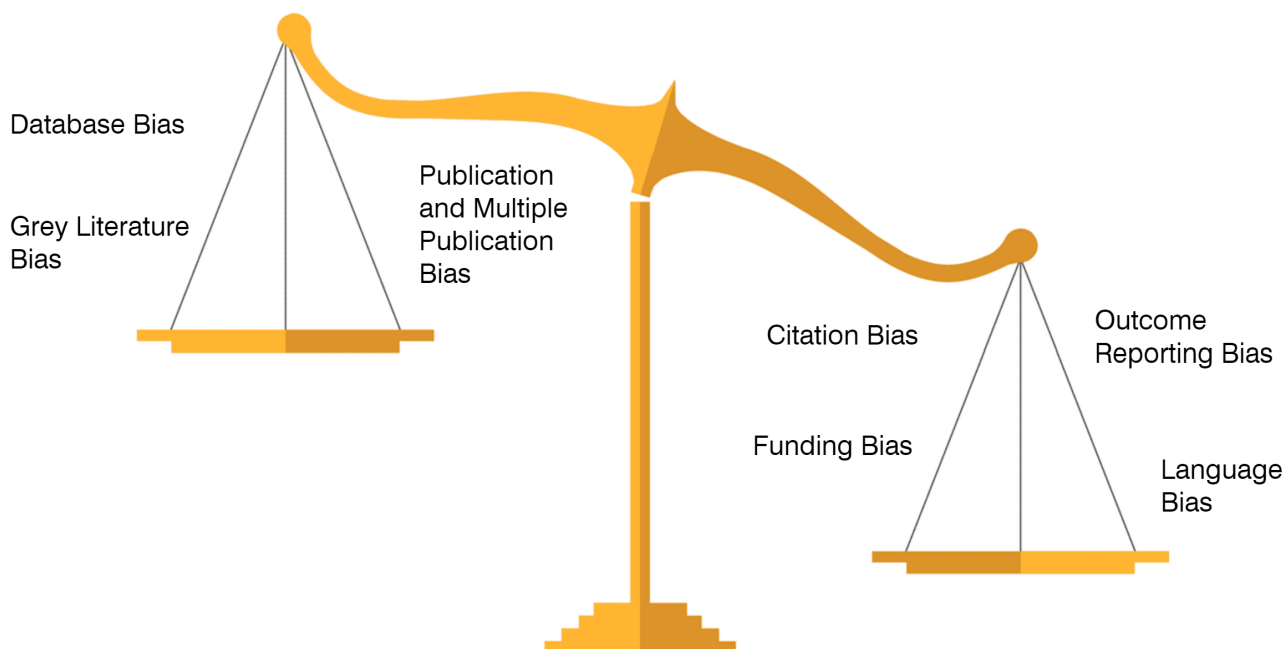
The methodological rigor of the systematic review should be considered, as well as the appropriateness of the methods for the review question set. For example, are the inclusion criteria appropriate for the question?

## Types of Bias

Different types of bias can affect the validity of a systematic review ([Booth et al., 2016](#)). Hover over each heading below to reveal the definition.



Interactive element available in online version of the material.







### **Note-Taking Activity: Countering Bias**

Can you think of ways to counter the threats that the biases outlined above may have on the validity of a review and its findings?

Note-Taking Activity: Countering Bias -

Can you think of ways to counter the threats that the biases outlined above may have on the validity of a review and its findings?

## Appraisal Tools



There are several resources that researchers can use to minimise bias while conducting systematic reviews. As a reader, you may find these resources helpful when appraising the systematic reviews of others.

## AMSTAR



AMSTAR (A MeaSurement Tool to Assess systematic Reviews) is a popular instrument designed to aid with critically appraising systematic reviews of RCTs. [AMSTAR 2](#) is an adaptation that additionally enables assessment of non-randomised healthcare intervention studies.

## ROBIS



While AMSTAR assists with broad critical appraisal, [ROBIS](#) (Risk of Bias in Systematic Reviews) aids, specifically, with assessing the risk of bias in systematic reviews. ROBIS also includes an optional section that helps with appraising the relevance of the methods of a review to its focus.

## Other Questions to Consider



[Booth and colleagues \(2016\)](#) offer several questions to guide researchers in assessing the likelihood of bias in their review:

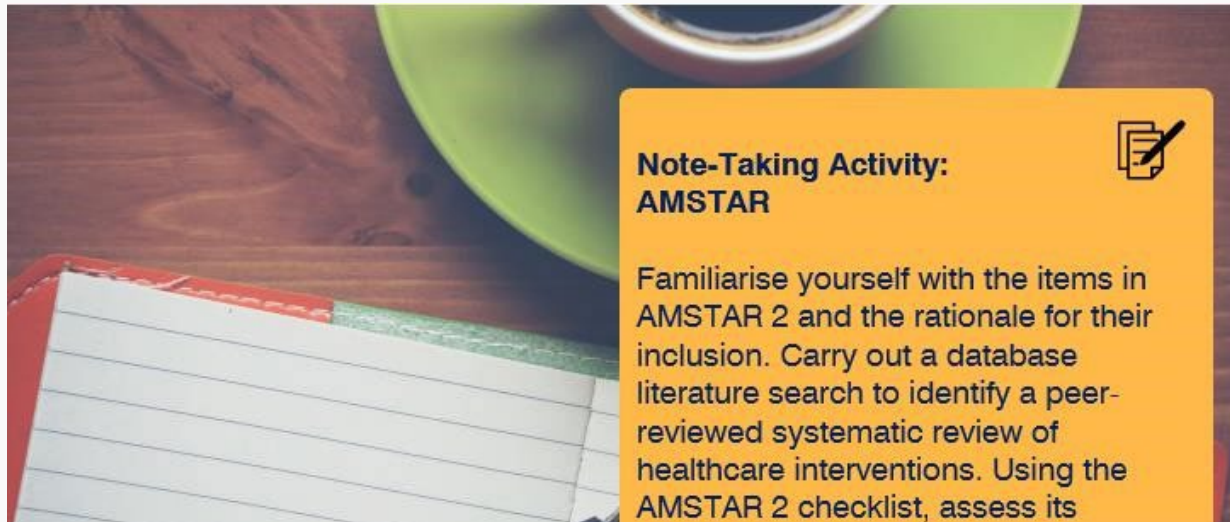
- Have I clearly specified the question to be examined by my review, how included studies address it, and the extent to which my conclusions answer the question?
- Have I defined explicit, objective eligibility criteria?
- How confident am I that I have identified all potentially eligible studies?
- Has the eligibility criteria been applied in ways that limit bias (i.e., so that I have not inappropriately accepted or rejected studies)?
- Have I guarded against outcome selection bias by assembling as high a proportion as possible of relevant information from included studies?
- Have I used various analyses to explore uncertainties in my findings?



- Have I presented my findings in a structured report with clear links between what is observed and what is concluded?

## AMSTAR

The [AMSTAR 2](#) checklist can be applied to critically appraise systematic reviews.



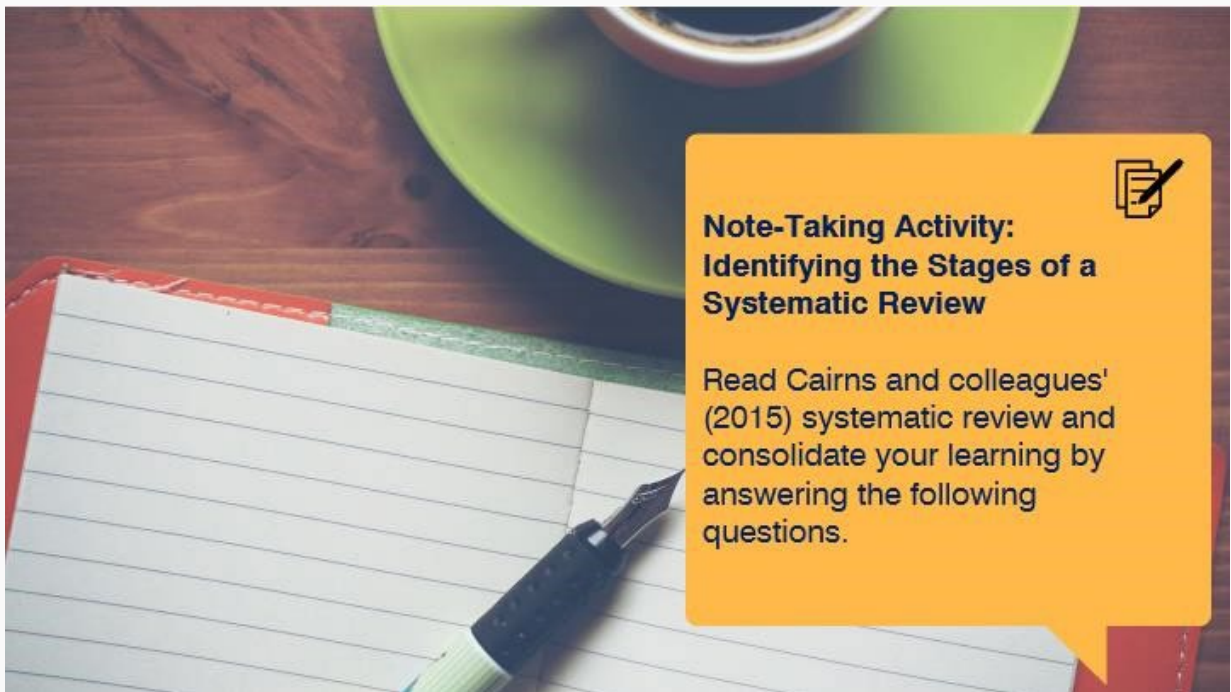
### Note-Taking Activity: AMSTAR -

Familiarise yourself with the items in AMSTAR 2 and the rationale for their inclusion. Carry out a database literature search to identify a peer-reviewed systematic review of healthcare interventions. Using the AMSTAR 2 checklist, assess its methodological quality.



## Identifying the Stages of a Systematic Review

[Cairns and colleagues \(2015\)](#) undertook a systematic review on the effectiveness of workplace interventions to tackle socio-economic inequalities in obesity.



### Note-Taking Activity: Identifying the Stages of a Systematic Review

Read Cairns and colleagues' (2015) systematic review and consolidate your learning by answering the following questions.

#### Note-Taking Activity: Identifying the Stages of a Systematic Review

- Read Cairns and colleagues' (2015) systematic review and consolidate your learning by answering the following questions. (Available in the next section, below this step).

1. Are the research aims and objectives identifiable?
2. Is an awareness of pre-existing research on the topic demonstrated?
3. Is there evidence of protocol development (i.e., PROSPERO registration)?
4. Did the authors use data extraction tools?
5. Do the authors make justifiable interpretations regarding what their findings contribute to the evidence base? Have the limitations of their review been considered?
6. Have reporting guidelines been used to report the findings?

## General Critical Reflections on Systematic Reviews

It is important to critically reflect on the utility and potential disadvantages of systematic reviews. Several considerations are highlighted below ([Hammersley, 2013a](#); [2013b](#)):

If rigid eligibility criteria are applied based on the evidence hierarchy (for example, including RCTs only), systematic reviews may exclude potentially useful forms of evidence such as qualitative studies and natural experimental studies ([Humphreys et al., 2017](#)).

### Strict Eligibility Criteria —

Due to their precise research questions and eligibility criteria, systematic reviews may exclude research studies whose relevance is not obvious ([Hammersley, 2013b](#)).

### Synthesis Challenges —

Systematic reviews tend to assume that all reviewed studies addressed the same specific issue and investigated it similarly, but this may not be the case, making it difficult to aggregate findings. [Hammersley \(2013b\)](#) highlights that studies may focus on different parts of the same picture and could be viewed as additive pieces of a mosaic.

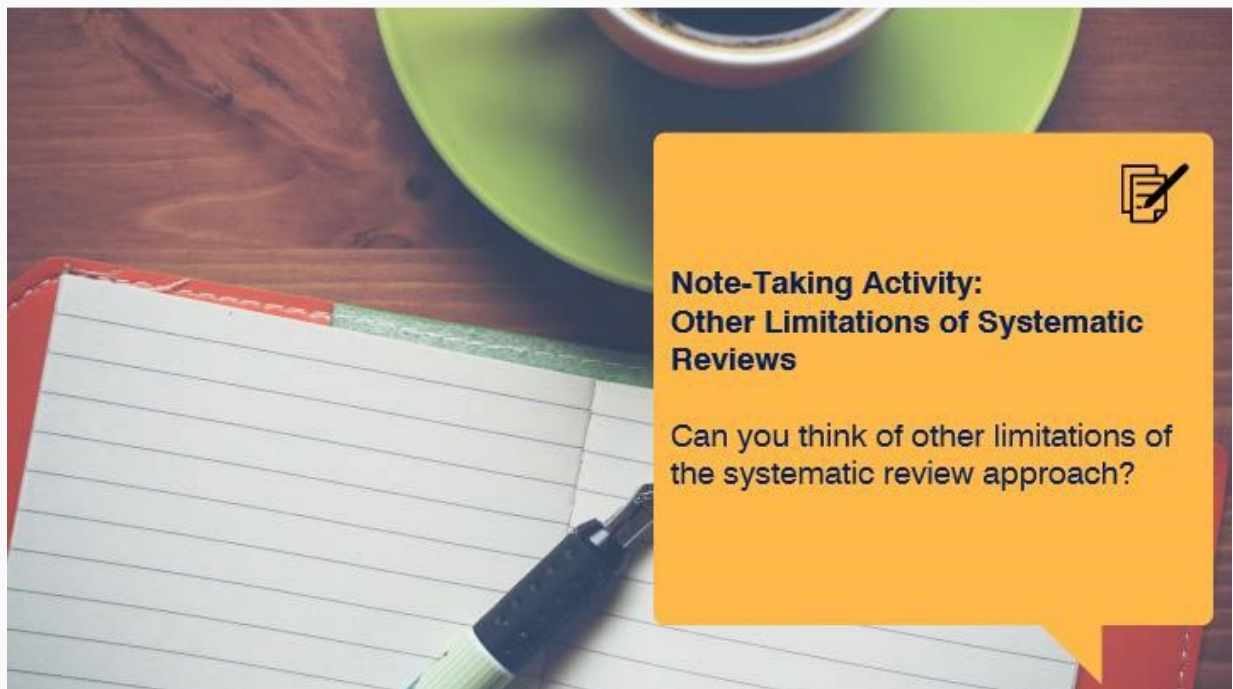
### Publication Bias —


If authors have not submitted non-significant findings to journals, or journals have not published such findings (the file-drawer problem), these

studies will not be readily available for inclusion in systematic reviews, potentially leading to overestimations of effects ([MacMillan et al., 2019](#)).

### Unhelpful Systematic-Unsystematic Distinctions —

[Hammersley\\_\(2013b\)](#) argues that the systematic-unsystematic distinction used to classify review types is unhelpful. It may assume that unsystematic reviews are not as trustworthy because they do not meet the 'systematicity' criteria. Instead, Hammersley suggests a distinction between 'issue-focused' and 'field-mapping' reviews, highlighting that the latter type (unsystematic reviews) are also of high value and they can meet the needs of service providers/policymakers and synthesise vast, complex bodies of research.





**Note-Taking Activity:  
Other Limitations of Systematic  
Reviews**

Can you think of other limitations of the systematic review approach?

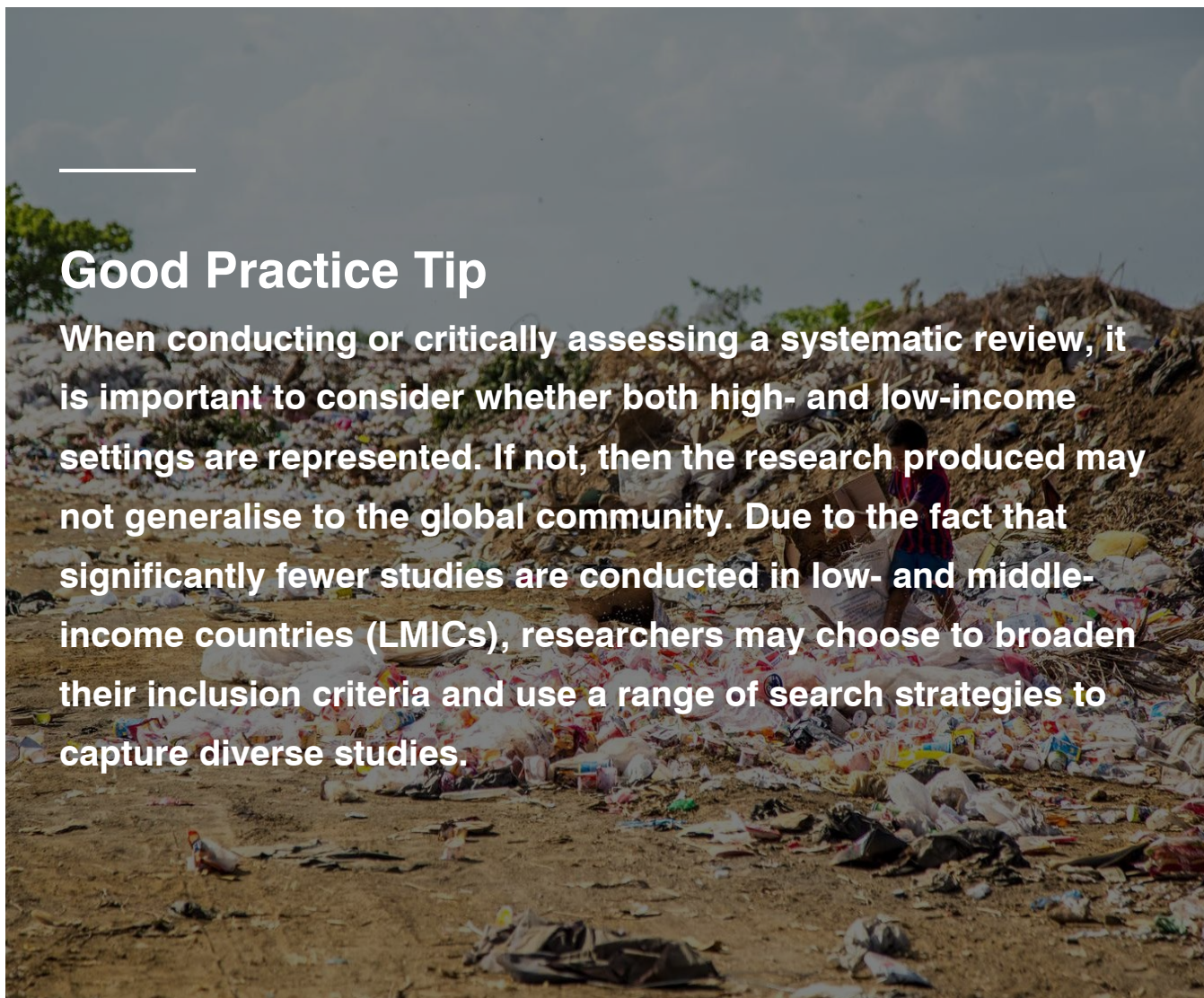
## Note-Taking Activity: Other Limitations of Systematic Reviews -

Can you think of other limitations of the systematic review approach?

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### Good Practice Tip

When conducting or critically assessing a systematic review, it is important to consider whether both high- and low-income settings are represented. If not, then the research produced may not generalise to the global community. Due to the fact that significantly fewer studies are conducted in low- and middle-income countries (LMICs), researchers may choose to broaden their inclusion criteria and use a range of search strategies to capture diverse studies.







## REFERENCE LIST Appraising Systematic Reviews.docx

14.2 KB



### Appraising Systematic Reviews

Booth, A., Sutton, A., & Papaioannou, D. (2016). *Systematic Approaches to a Successful Literature Review*. Sage Publications.

Cairns, J. M., Bambra, C., Hillier-Brown, F. C., Moore, H. J., & Summerbell, C. D. (2015). Weighing up the evidence: a systematic review of the effectiveness of workplace interventions to tackle socio-economic inequalities in obesity. *Journal of public health*, 37(4), 659-670. (**open access**)

Hammersley, M. (2013a). On 'Systematic' Reviews of Research Literatures. In '*The Myth of Research-Based Policy & Practice*', Martyn Hammersley (Ed.), Sage Publications.

Hammersley, M. (2013b). Systematic or Unsystematic, Is That the Question? Some Reflections on the Science, Art and Politics of Reviewing. In '*The Myth of Research-Based Policy & Practice*', Martyn Hammersley (Ed.), Sage Publications.

Humphreys, D. K., Panter, J., & Ogilvie, D. (2017). Questioning the application of risk of bias tools in appraising evidence from natural experimental studies: critical reflections on Benton et al., IJBNPA 2016. *International Journal of Behavioral Nutrition and Physical Activity*, 14(1), 1-4. (**open access**)

Liabo, K., Gough, D., & Harden, A. (2017). Developing justifiable evidence claims. In *An introduction to systematic reviews*, 251-277.

MacMillan, F., McBride, K. A., George, E. S., & Steiner, G. Z. (2019). Conducting a Systematic Review: A Practical Guide. In '*Handbook of Research Methods in Health Social Sciences*', Pranee Liamputtong (Ed.). Western Sydney University. Singapore: Springer, 805-826.

Shea, B. J., Reeves, B. C., Wells, G., Thuku, M., Hamel, C., Moran, J., ... & Henry, D. A. (2017). AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. *BMJ* 358. (**open access**)

Whiting, P., Savović, J., Higgins, J. P., Caldwell, D. M., Reeves, B. C., Shea, B., ... & Churchill, R. (2016). ROBIS: a new tool to assess risk of bias in systematic reviews was developed. *Journal of clinical epidemiology*, 69, 225-234. (**open access**)



## Recap Quiz

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Interactive element available in online version of the material.

### Quiz (8 minutes)

A risk of bias assessment of included studies is expected in scoping reviews.

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☐

Yes

☐

No

SUBMIT

The short words used in database searches to connect your search terms and broaden or narrow your search are called...:

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- ☐ Stop words
- ☐ Boolean operators
- ☐ Truncation
- ☐ Wildcards

SUBMIT

Which of the following are common bibliography management software packages?

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- ☐ EndNote
- ☐ Zotero
- ☐ Mendeley
- ☐ LaTeX

☐

All of the above

SUBMIT

The PRISMA extension for scoping reviews is called...:

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☐

PRISMA-P

☐

SQUIRE

☐

PRISMA-ScR

☐

PRISMA-S

SUBMIT

The description, "Typically results in hypothesis or model. Seeks to identify conceptual contribution to embody existing or derive new theory", characterises which literature review approach best?

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- ☐ Rapid review
- ☐ Critical review
- ☐ State-of-the-art review
- ☐ Umbrella review

SUBMIT

The 'PICO' framework helps one...:

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- ☐ Conduct a risk of bias assessment
- ☐ Construct a review question

☐

Choose a review type

☐

Sift and screen studies

SUBMIT

The 'FORM' framework helps one...:

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☐

Conduct a risk of bias assessment

☐

Construct a review question

☐

Formulate recommendations for clinical guidelines

☐

Choose a review type

SUBMIT

The phenomenon whereby studies finding nonsignificant results remain unpublished due to authors not submitting their work to journals, or journals not publishing such findings, is called...:

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- ☐ Grey literature
- ☐ Salami slicing
- ☐ Publication bias
- ☐ Researcher effect
- ☐ Confirmation bias

SUBMIT

END OF SESSION