Advanced Research Skills: Conducting Literature and Systematic Reviews (2nd Edition)

ADVANCED RESEARCH SKILLS: CONDUCTING LITERATURE AND SYSTEMATIC REVIEWS (2ND EDITION)

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Part V. Module 4: Strategic Reading

Part VI. Conclusion and More Resources

This Second Edition of Advanced Research Skills: Conducting Literature and Systematic Reviews has been revised and expanded to include new search resources and reading strategies. The accessibility features have also been enhanced.

Advanced Research Skills: Conducting Literature and Systematic Reviews was audited for accessibility issues using Sa11y.

Sa11y is an **accessibility quality assurance** tool that **visually highlights** common accessibility and usability issues.

Accessibility features of the web version of this resource

The web version of Advanced Research Skills: Conducting Literature and Systematic Reviews includes the following features:

- It as been optimized for people who use screen-reader technology:
    - All content can be navigated using a keyboard,
    - Links, headings, and tables use proper markup, and
    - All images have text descriptions.
    - Infographics and images with large amounts of text have long descriptions provided below the figure.

Other formats available

In addition to the web version, this book is available in a number of file formats including Digital PDF and EPUB (for eReaders).

- Download this book in another file format (look for the Download this book drop-down menu to select the file type you want.)

Known accessibility issues and areas for improvement

There are no known accessibility issues at this time.

Let us know if you are having problems accessing this

book

If accessibility issues are stopping you from accessing the information in this short course, please contact us to let us know and we will get it fixed. If you discover any other issues, please let us know of those as well.

Please include the following information:

- The location of the problem by providing a web address or page description
- A description of the problem
- The computer, software, browser, and any assistive technology you are using that can help us diagnose and solve your issue
  e.g., Windows 10, Google Chrome (Version 65.0.3325.181), NVDA screen reader

You can contact us at kdermody@torontomu.ca

This statement was last updated on February 28, 2023

PART I
INTRODUCTION

1.

Continuing Studies students at work in the classroom. By Flickr user Simon Fraser University – Communications & Marketing Licensed under Creative Commons CC BY-ND 2.0

The Purpose of This Course

This short course is on the research component of conducting a literature or systematic review.

The purpose is to spark your intellectual curiosity and develop your research skills. Research is an important part of your review and your work will add to the scholarly discourse of your topic. This self-guided course will help you outline your goals for your review and demonstrate how adopting a mind-set of persistence, adaptability, and flexibility will help you achieve them.

Throughout the course, we provide examples and activities designed to help you develop your essential research skills. In Module 1, we provide a quick overview of the different types of academic reviews and the steps involved in conducting them. In Module 2, we demonstrate how to formulate your research question and how to search for sources. In Module 3, you will learn how to select and organize your sources. Finally, in Module 4, we outline techniques for reading and assessing the quality of your sources.

What You Need

- An estimated 20 minutes per module (depending on how many of the links to resources you explore, you may take more time)
- Access to a computer and the Internet
- Access to your institution's library website
- Access to your own notebook or MS Word/Google Doc to take notes

How to Navigate the Modules

We have designed this short course to be done at your own pace and at your own point of need. Therefore, you can navigate to the parts you find relevant to your current situation.

This version of the course is hosted in Pressbooks (a WordPress-based online platform). Pressbooks is used to host open textbooks and, in this case, a short course. Please see the video below on how to navigate Pressbooks.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=21#oembed-1

Iowa State University Digital Press. Navigating Your Course Pressbook. Licenced under Creative Commons CC BY-NC 4.0. (Closed Captioned)

Research Roadmap Workbook

The workbook is designed to help you reflect and document your research process. Throughout this short course, you will have the opportunity to use the workbook to document aspects of your review. You can refer back to this workbook during the research phase of your review.

How to Use the Workbook

The link below will create a personal copy of the workbook. This workbook is a Google Document and by clicking on the link, a copy of the workbook will save to your Google Drive. This is your personal copy of the Workbook for your own records that you can return to whenever you are prompted to do a workbook activity throughout this short course.

[Advanced Research Skills: Conducting Literature and Systematic Reviews Workbook](#)

Learning Outcomes

Below are the learning outcomes for the overall course. Each module will include a list of objectives/outcomes specific to that module to guide you through your learning.

By the end of this course, you should be able to:

1. Understand the specific characteristics of your chosen review and describe the steps involved in conducting a successful review.
2. Determine your research question and design and refine your own search strategy.
3. Choose appropriate resources to search and recognize other serendipitous methods of information gathering.
4. Develop a plan to organize your sources.
5. Screen your search results and pick relevant sources for your review.
6. Recognize how to avoid plagiarism and demonstrate the rules of your chosen citation style.
7. Evaluate the relevance of a source to your own context.

What This Course Does Not Cover

This course concentrates on the research component of conducting a review. We do not cover how to write a review. Also, we will not cover how to extract and analyze data.

In our last section, [Resources to Keep you Going](#), we provide resources that you can consult if you need information on these topics.

2.

Complete **Activity 0: "Review Your Research Skills"** in your Research Roadmap Workbook.

This survey will help you reflect on which research skills you have and what you need to work on. You can return to this document as you continue through your review to reflect on the progress you have made.

For more information please see Workbook Instructions in the Introduction Module.

PART II
MODULE 1: TYPES OF REVIEWS

Students collaborating together. By Flickr user Joris Louwes Licensed under Creative Commons CC BY-ND 2.0)

In this module, we will go over the different types of academic reviews and a quick overview of the steps involved in conducting them. If you are unsure about which review to choose for your own work this module will help you understand the difference between each review and help you make an informed decision.

If you know which review you will be conducting feel free to skip to relevant sections that will answer any questions you might have.

Learning Outcomes

By the end of this module, you will be able to:

1. Distinguish between the different characteristics of reviews so you can make an informed decision when choosing the appropriate review to meet your scholarly requirements.
2. Describe the steps involved in conducting your review
3. Locate existing reviews and analyze how these reviews will apply to your research.

Complete **Activity 1.1: "My Review"** in your Research Roadmap Workbook.

Before you start a review, it's always a good idea to make sure you take some time to reflect on what your objectives are. This survey will help you articulate what time/resources you have available and what you tentatively plan to undertake. Keep your answers in mind as you read through the module to see if you are on the right track or if you need to modify your objectives.

For more information please see <u>Workbook Instructions</u> in the Introduction Module.

<u>University student studying</u>. By Flickr user <u>University of Central Arkansa's Photostream</u> under Creative Commons <u>CC BY-NC-ND 2.0</u>.

Both literature and systematic reviews are aimed at assembling, critically evaluating and reviewing existing research on a central topic or research question. Some differences between them include the method for determining what research to include or exclude, the extent or scope of the review, and the duration of time required to complete the process. To help you determine which review is most appropriate, please see Table 1.1 below for a detailed explanation of each as well as the differences between each type of review.

Table 1.1. Difference Between Systematic and Literature Reviews

Component	Literature Review	Systematic reviews
Definition	A **literature review** is a qualitative integrative summary of published research on a specific topic. The literature review seeks to synthesize what is already known about the topic, and sometimes, explicitly state what is not known, or not well understood.	**Systematic reviews** bring together information from a range of sources to answer a specific research question. They differ from a traditional literature review or narrative review, in that they aim to synthesize and analyze the research in an unbiased, rigorous and systematic way so that it can be used to support evidence-based practice.
Goals	• Provide summary or overview of topic	• Answers a focused **clinical** question • Eliminate bias
Question	• Can be a general topic or a specific question	• Clearly defined and answerable clinical question • Recommend using a formula like PICO(T) as a guide
Components	• Introduction • Methods • Discussion • Conclusion • Reference list OR • Literature review section within a research article (***See note below table)**	• Pre-specified eligibility criteria • Systematic search strategy • Assessment of the validity of finding • Interpretation and presentation of results • Reference list
Number of Authors	• One or more	• Three or more

Timeline	• Weeks to months	• Months to years
Requirement	• Understanding of topic • Perform searches through databases and other resources	• Thorough knowledge of topic • Perform searches of all relevant databases • Statistical analysis resources (for meta-analysis)
Value	• Provides summary of literature on the topic	• Connects practicing clinicians to high quality evidence • Supports evidence-based practice

Adapted from Kysh, Lynn (2013): Difference between a systematic review and a literature review. Figshare (Poster), https://doi.org/10.6084/m9.figshare.766364.v1. Licensed under Creative Commons CC BY 4.0 /order and some words changed.

Note on Table 1.1.

There are two ways to present a literature review: it can be one section in an original study, or it can be a standalone full review. More examples are given in the section on Literature Reviews.

A **literature review** is an integrative summary of published research on a specific topic. The literature review seeks to **synthesize** what is already known about the topic, and sometimes, explicitly state what is not known, or not well understood.

Remote Learning Online- A young adult taking online classes. By Flickr user The Focal Project. Licensed under Creative Commons CC BY-NC 2.0

The following are the key characteristics of a literature review:

- It contains a clear research question/problem that it is trying to answer.
- **It is not a list** describing or summarizing one piece of literature after another.
- It is organized into sections that present themes or identify trends, including relevant theory related to the research question.

Example

A literature review may serve as a stand-alone piece or article such as this article by Francisco Javier Pérez Latre et al., on [Social Networks](#)[1]

However, more often a literature review is part of a larger research publication such as this example from Nia Contini et al., on [Boating-related fatalities in the Northwest Territories](#)[2]

Why Are Literature Reviews Important?

Literature reviews help authors and readers build their knowledge about a specific topic by synthesizing research on the subject. Literature reviews use published research to provide context to the topic and may expose debates within the field, gaps in the research, or provide a summary and analysis of research to date on the topic.

Key Takeaways

Literature reviews are not a summary of a couple of sources you found on your topic. Your review

1. Citation: Pérez-Latre, F. J., Portilla, I., & Sánchez-Blanco, C. (2011). Social networks, media and audiences: A literature review. Communication & Society, (24)1, 63-74.https://revistas.unav.edu/index.php/communication-and-society/article/view/36221 *Communication & Society is licensed under Creative Commons Attribution-Noncommercial-NoDerivatives 4.0.
2. Citation Nia Contini, Audrey R. Giles, Gordon Giesbrecht & Tyrone Raddi (2021) The adaptation of the beyond cold water bootcamp course for Inuvialuit communities in Northwest Territories, Canada, International Journal of Circumpolar Health, 80:1, DOI: 10.1080/22423982.2021.1969744

should present themes or identify trends, including relevant theory found in the literature you reviewed.

All reviews follow a familiar process:

1. Find and examine existing literature reviews.
2. Formulate a research question.
3. Search for sources.
4. Assess the quality of your results and select your sources.
5. **Synthesize** the important information from your sources.
6. Analyze what you've found.

Find and Examine Existing Literature Reviews

Prior to starting your own research, you will want to look at existing literature reviews – this is especially important so that you don't duplicate existing work. It can also be helpful to look at the approaches taken for literature reviews similar to your own topic or discipline. Below are some examples of locating existing reviews.

Example

1. **Search in academic journal articles** – All published articles have literature reviews. They are a key component of an academic journal article as they create the foundation for new research and establish credibility for the authors. Authors need to demonstrate to peer reviewers and readers that they have a good command of the existing literature, and they have identified a gap they will fill with the present study.
2. **Identify clusters of citations in published articles** – Sometimes, literature reviews are clearly labelled as such with a descriptive heading, but more often, they are presented as part of the introduction or background section at the beginning of the article. The telltale sign that you are looking at the literature review is the presence of clusters of citations.
3. **Search for "literature review" articles** – While most literature reviews are done in the context of laying the groundwork for an original study, some are published as articles in their

own right. When searching for this type of article you can limit part of your search strategy to look for the term "**literature review**" in the title of the article.

Formulate a Research Question

In general, your research question will tackle the problem you are trying to address by conducting the review. Since constructing a research question can be an in-depth process, we go over it in more detail in [Module 2: Formulating a Research Question and Searching for Sources](#).

Conduct Your Review Using the SALSA Framework

Once you have a research question, there are four stages you can follow when conducting your chosen review. These are known as the [SALSA Framework](#): **s**earch, **a**ppraisa**l**, **s**ynthesis and **a**nalysis.

Example

Here is a quick summary of the SALSA steps.

> *An interactive H5P element has been excluded from this version of the text. You can view it online here:*
> *https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=34#h5p-1*

Wait, What happened to the "L" in SALSA?

Did you notice the missing L? We did too! The authors, Grant and Booth (2009) created a simple analytical framework for conducting reviews: **S**earch, **A**ppraisal, **S**ynthesis and **A**nalysis. SASA, however, doesn't make a memorable acronym, and Academics love a good acronym, so they derived the "L" from the last letter of appraisal: **S**earch, **A**ppraisa**L**, **S**ynthesis and **A**nalysis (SALSA).

What Are Systematic Reviews?

A systematic review is also known as **evidence synthesis** because it brings together information from a range of sources to answer a specific research question. It differs from a traditional literature review, in that it aims to **synthesize** and **analyze** the research in an unbiased, rigorous and **systematic** way so that it can be used to support evidence-based practice.

Characteristics

- The scope of the review is established in advance (including the research question and pre-defined eligibility criteria).
- A systematic search is conducted in order to identify all studies/resources that would meet the eligibility criteria.
- The methodology used to search, assess, analyze and synthesize studies/resources is explicit and reproducible.
- The review assesses the validity of the studies/resources for a risk of **bias** .
- The review uses explicit methods for extracting and synthesizing study findings (**qualitative** or **quantitative**).

Types of Systematic Reviews

There are **different types of reviews** that involve evidence synthesis and a systematic review is the most well known version. Other examples include a rapid review or a scoping review. We define the different types in more detail below.

Example

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https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=36#h5p-2

Learning Activity

Determine what type of review would be the best fit for each of the following research questions.

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https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=36#h5p-3

Teams and Time Considerations

A review like a systematic review or a meta-analysis can take **at least a year to complete** and is usually **conducted by a team**. If your review is for **a class assignment,** you can still conduct a systematic review without a team or a year to complete it. If your aim is to eventually publish your review, keep in mind that one of the main goals of a systematic review is to try and eliminate potential bias, and working independently can be viewed negatively. If you must work independently, you should identify this limitation when writing your review.

A college girl is studying for her end of year exam. By Flickr user CollegeDegrees360. Licensed under Creative Commons CC BY-SA 2.0

Systematic Reviews and Bias

Eliminating bias as much as possible is one of the key characteristics of systematic reviews. By bias, we mean that some type of systematic error has occurred during the review stage that leads to the acceptance of outcomes and conclusions of a study. This can result in the possibility of unfair or misleading information within the reviews. Bias is potentially introduced at any stage of the research process, from formulating your research question to choosing which sources to include.

In order to reduce bias in your review, you will need to undertake a quality assessment throughout the review process. Your **protocol** (see next section) and your **screening** process will help you reduce your bias. Another way to reduce bias is to work in a team setting, and this is why some reviews require more than one person. We will cover how to check for bias when screening sources in Module 3 Organizing, Managing and Screening Sources.

Why Are Systematic Reviews Important?

A systematic review can generally give us the most dependable answer to a specific research question, and it can identify gaps in our knowledge that require further research. It also communicates the strength of the available evidence and the quality of included studies. This indicates how much confidence practitioners, service users, managers, policy makers, and the popular media should have in the results (Gough & Richardson, 2018).

What Type of Systematic Review is Right for You?

Booth et. al (2016) suggest that your choice of review methods should be determined by five main considerations captured by the acronym, TREAD

These and other factors may determine what kind of review is most appropriate to answer your research question.

The original version of this chapter contained H5P content. You may want to remove or replace this element.

Learning Activity

Decision Tools

The following tools can help you pick the right systematic review:

- Knowledge Synthesis Decision Tool Unity Health Toronto Health Science Library, St. Michael's Hospital
- Review Ready Reckoner – Assessment Tool (RRRsAT). Temple University Libraries

Key Takeaways

It is important to understand and meet the specific requirements of your chosen review, especially if you plan to publish your review.

3.

This section is a quick summary of the main steps involved in conducting systematic reviews. By the end of this section you should have a better idea of the time and resources needed to conduct a successful review.

All reviews follow a familiar process as seen in Figure 1.1 below.

Figure 1.1 What Authors Do: Systematic Reviews. Designed by Jessica Kaufman, Cochrane Consumers & Communication Review Group, Centre for Health Communication & Participation, La Trobe University, 2011. Licensed under Creative Commons CC BY 4.0.

What authors DO

Identify the issue and determine the question

Write a plan for the review (protocol)

Search for studies

Sift and select studies

Extract data from the studies

Assess the quality of the studies

Combine the data (synthesis or meta-anlysis)

Discuss and conclude overall findings

Systematic Review

Dissemination

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https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=39#h5p-4

Find Existing Systematic Reviews

Prior to starting your own research, you will want to look at existing systematic reviews – this is especially important so that you don't duplicate existing work. It can also be helpful to look at the approaches taken for systematic reviews similar to your own topic or discipline. You can find existing systematic reviews through a number of ways:

1. **Search published journal articles.** Systematic reviews can be published as journal articles. To identify them, add "systematic review" as an additional search term in databases, or look for publication type limits, if available. Here's an example of a "systematic review" published as a journal article.
2. **Search "Cochrane Database of Systematic Reviews" through your library.** This database includes the full text of the regularly updated systematic reviews of the effects of healthcare prepared by The Cochrane Collaboration.
3. **Search different protocol registries.** For example, PROSPERO is an international database of prospectively registered systematic reviews in health and social care, welfare, public health, education, crime, justice, and international development, where there is a health related outcome. PROSPERO aims to provide a comprehensive listing of systematic reviews registered at inception to help avoid duplication and reduce opportunity for reporting bias by enabling comparison of completed reviews with what was planned in the protocol.
4. **Search the Campbell Collaboration.** The Campbell Collaboration is an international network which publishes high quality systematic reviews of social and economic interventions around the world.

Key Takeaways

Looking at published reviews and protocols can give you an idea of what has already been done and will help you ensure that your own research is original.

Assembling Your Research Team

If you are conducting a systematic review that requires a team these are the typical roles involved:

- **Reviewers** – You may need at least two reviewers working independently to screen abstracts, with a potential third as a tie-breaker
- **Subject matter experts** – Subject matter experts can clarify issues related to the topic,
- **Statistician** – A statistician can help with data analysis
- **Project leader** – A project leader can coordinate and write the final report
- **Librarians** – Librarian(s) can develop comprehensive search strategies and identify appropriate databases

Formulate Your Research Question

In general, your research question will tackle the problem you are trying to address by conducting the review. Since constructing a research question can be an in-depth process, we go over it in more detail in Module 2: Formulating a Research Question and Searching for Sources.

Create a Review Protocol

Reviews like a systematic review require a **protocol**, which is essentially a planning document that indicates how your review will be carried out. Here is a sample protocol template from the Evidence Synthesis

Coordinator at the Maritimes Strategy for Patient-Oriented Research (SPOR) Support Unit. This basic form includes all the relevant information needed for a simple protocol.

You may wish to register your protocol to avoid the duplication of work and to reduce the potential for bias by enabling a comparison between what was stated in the protocol to the completed review. It is also a way to share your current research interests with the research community at large, and help build your research profile.

Example

How to Register your Protocol:

Please see this guide by the National Institute of Health (an agency of the United States government): Systematic Reviews Protocol and Protocol Registries.

Key Takeaways

By creating a protocol you are creating a document that will guide you through the systematic review process. Always refer to it throughout the process to ensure you are on track.

Conducting Your Review Using the SALSA Framework

Once you have a research question, there are four stages you can follow when conducting your chosen review. These are known as the SALSA Framework: **s**earch, **a**ppraisa**l**, **s**ynthesis and **a**nalysis.

Example

Here is a quick summary of the SALSA steps.

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Wait, What Happened to the "L" in SALSA?

Did you notice the missing L? We did too! The authors, Grant and Booth (2009) created a simple analytical framework for conducting reviews: **S**earch, **A**ppraisal, **S**ynthesis and **A**nalysis. SASA, however, doesn't make a memorable acronym, and Academics love a good acronym, so they derived the "L" from the last letter of appraisal: **S**earch, **A**ppraisa**L**, **S**ynthesis and **A**nalysis (SALSA).

Example

Applying the SALSA Framework to Your Specific Review

We've provided a quick summary of the framework, and once you have chosen your specific type of review you should consult the following chart by Grant and Booth (2009) for a deep dive into each stage of the SALSA framework for your specific review.

A typology of reviews: an analysis of 14 review types and associated methodologies. [1]

PRISMA: The Systematic Review Checklist

PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) is an evidence-based minimum set of items for reporting in systematic reviews and meta-analyses. PRISMA is the recognized standard for reporting evidence in systematic reviews and meta-analyses. The standards are endorsed by organizations and journals in the health sciences. It allows other researchers to assess strengths and weaknesses of the review and assists with future replication of the review methods. The 2020 PRISMA statement consists of a 27-item checklist and a 4-phase flow diagram.

Example

For more information, consult the PRISMA Explanation and Elaboration document.

If you are conducting a scoping review, see The PRISMA-ScR (PRISMA Extension for Scoping Reviews)

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1. Citation: 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. https://doi.org/10.1111/j.1471-1842.2009.00848.x

Key Takeaways

A large amount of time and resources go into conducting a systematic review. To make sure you are ready to carry out a review, use the [Knowledge Synthesis Readiness Checklist](#) from Unity Health Toronto.

4.

Conducting a review requires good time management. Feel free to use the **To Do List: Research Stage** to keep track of your timeline and tasks for the research stage of your review.

For more information please see <u>Workbook Instructions</u> in the Introduction Module.

5.

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We've come to the end of this module. Below are the key points that we hope you will take away from the topics covered:

Literature Reviews

- A **literature review** is a qualitative integrative summary of published research on a specific topic.
    - It is **not a list** describing or summarizing one piece of literature after another.
    - It is organized into sections that present themes or identify trends, including relevant. theory related to the research question.
- One way to conduct reviews is with the SALSA Framework: **s**earch, **a**ppraisal, **s**ynthesis and **a**nalysis.

Systematic Reviews

- A **systematic review** brings together information from a range of sources to answer a specific research question. It differs from a traditional literature review, in that it aims to synthesize and analyze the research in an unbiased, rigorous and systematic way so that it can be used to support evidence-based practice.
- Some reviews need to be conducted in a team and can take up to 1 year to complete.
- Systematic reviews usually have a research protocol
- One way to conduct reviews is with the SALSA Framework: **s**earch, **a**ppraisal, **s**ynthesis and **a**nalysis.
- PRISMA is an evidence-based minimum set of items for reporting in systematic reviews and meta-analyse

Literature Reviews

Websites

- [Guide to Literature Reviews](#) (McMaster University Library)
- [Writing a Literature Review](#) (OWL, Purdue University)

Articles and Books

Aveyard, H. (2019). *Doing a literature review in health and social care: A practical guide (Fourth ed.)* Open University Press, McGraw-Hill Education.

Jesson, J., Matheson, L., & Lacey, F. M. (2011). *Doing your literature review: Traditional and systematic techniques.* SAGE.

Ridley, D., Dr. (2008). *The literature review: A step-by-step guide for students.* SAGE.

Systematic Reviews

Helpful Websites

- [Systematic Reviews](#) (Toronto Metropolitan University)
- [Cochrane Database of Systematic Reviews](#)
- [Systematic Review Guide](#) (Unity Health Toronto)

Registering Your Systematic Review

- [PROSPERO](#)
- [Campbell Collaboration](#)
- [PRISMA 2020 Checklist](#)

Articles and Books

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, 8(1), 19-32. doi:[10.1080/1364557032000119616](10.1080/1364557032000119616)

Boland, A., Cherry, M. G., & Dickson, R. (2014). *Doing a systematic review: A student's guide*. Sage SAGE.

Ganann, R., Ciliska, D., & Thomas, H. (2010). Expediting systematic reviews: Methods and implications of rapid reviews. *Implementation Science,* 5(1), 56-56. [doi:10.1186/1748-5908-5-56](doi:10.1186/1748-5908-5-56)

Glass, G. (1976). Primary, Secondary, and Meta-Analysis of Research. *Educational Researcher*, 5(10), 3-8. [doi:10.2307/1174772](doi:10.2307/1174772)

Gough, D., & Richardson, M. (2018). Systematic reviews. In *Advanced research methods for applied psychology* (pp. 63-75). Routledge.

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. https://doi.org/10.1111/j.1471-1842.2009.00848.x

Higgins J.P.T, Thomas J, Chandler J, Cumpston M, Li T, Page M.J, Welch V.A. (Eds). (2021, February). *Cochrane Handbook for Systematic Reviews of Interventions version 6.2*. Cochrane. www.training.cochrane.org/handbook.

PART III

MODULE 2: FORMULATING A RESEARCH QUESTION AND SEARCHING FOR SOURCES

6.

SFU Continuing Studies students at work in the classroom. By Flickr user Simon Fraser University – Communications & Marketing under Creative Commons CC BY-ND 2.0

In this module we go over the framework for searching the literature. Keep in mind that searching is a non-linear and potentially iterative process; as such you may need to review and revise earlier steps at any point.

The steps to searching the literature are:

1. Formulating a research question
2. Identify search terms (keywords)
3. Brainstorm more search terms
4. Construct a search strategy
5. Select and Search Databases
6. Manage your search strategies and results (Covered in Module 3: Organizing, Managing and Screening Sources)

We will show you how to use special techniques like forward and backward citation searching to find more

sources. Finally, if you are conducting a systematic review you should check out our special section on how to document your search strategy and results.

Learning Outcomes

By the end of this module, you will be able to:

1. Determine your research question
2. Design and refine your own search strategy
3. Choose appropriate resources to search
4. Know how to use other serendipitous methods of information gathering and when to stop searching
5. Document your search strategy

7.

Learning Activity

Test your knowledge of Boolean, truncation and other searching techniques.

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=52#h5p-7

Need a Refresher on Basic Searching Skills?

Check out these guides:

- Searching for Sources (Research Skills Tutorial). Toronto Metropolitan University Library
- Library Research Skills Tutorial. McMaster University Library

8.

As noted in <u>Module 1: Types of Reviews</u>, conducting a "pre-search" is a crucial first step in devising the research question. A well-formulated research question informs the research process. It can focus your information needs (i.e. identify inclusion and exclusion criteria), help to identify key search concepts, and guide you in the direction of relevant resources.

Types of Research Questions

There are two general types of research questions: **quantitative** and **qualitative**.

Quantitative Research Questions

Types of **quantitative questions** can be categorized as explanatory (i.e., relationship-based), descriptive, or comparative.

- **Explanatory questions** aim to discover cause-and-effect relationships by comparing two or more variables, individuals or groups based on differing outcomes.
- **Descriptive questions** will often quantify a single variable but may include multiple variables within a question. They typically ask for measurements, and can begin with: "how much", "what percentage", "how frequently", or "how many".
- **Comparative questions** are designed to identify the "difference between" a dependent variable and two or more groups. These questions tend to begin with "what is the difference" or "what are the differences".

Qualitative Research Questions

Qualitative questions aim to discover meaning or gain an understanding of a phenomenon. They ask questions that cannot be measured with specific numbers and statistics. Qualitative research questions often contain words like **"lived experience", "personal experience", "understanding", "meaning", and "stories".**

A Comparison of Quantitative and Qualitative Questions

So how do quantitative and qualitative research questions differ when you are conducting a search? In Table 2.1 below, we provide some examples of research topics. Each topic can either be used for a quantitative or qualitative research question. For each question, the category of research question is clarified.

Table 2.1. Examples of Quantitative and Qualitative Research Questions

Topic	Quantitative Research Questions	Qualitative Research Questions
Housing insecurity for children	**Explanatory:** How does experiencing housing-insecurity in childhood impact a child's relationships in adulthood?	**Lived experience:** What are the lived experiences of children experiencing housing-insecurity while attending elementary School?
Nursing and workplace violence	**Descriptive:** What percentage of nurses experience violence in the workplace on night shifts?	**Personal understanding:** How do nurses conceptualize their role in mitigating workplace violence?
Mental health of Canadian immigrants	**Comparative:** What are the differences in perceptions towards accessing mental health services between immigrants and their Canadian-born children?	**Personal experience:** How do newly arrived Canadians experience seeking help for mental health concerns?

Key Takeaways

Regardless of the type of question being asked, a good research question cannot be answered with a simple yes or no (as demonstrated by the sample questions in Table 2.1).

9.

Formulas

Using a formula is another way to construct a research question and is recommended if you are conducting a systematic review. There are various formulas you can use to craft your question, see Table 2.2 below.

Table 2.2. Formulas for Constructing Research Questions

Formula	Components Within the Formula	Example
PICO(T)	• Population/**P**roblem • Intervention/**E**xposure • Comparator • Outcome • Time Period/Type of Study *Note: the time period and type of study are optional*	**P**: Patients who have undergone knee surgery **I**: Post-operative infection **C**: Patients without post-operative infection **O**: Duration of recovery
PS	• Population/Problem • Situation	**P**: New immigrants **S**: Accessing mental Health Care
PIE	• Population • Intervention • Effect / Outcome	**P**: Children experiencing homelessness **I**: Breakfast program at school **E**: Academic performance
PEO	• Population/Problem • Exposure • Outcomes/Themes	**P**: Health professionals **E**: Caring for patients with Dementia **O**: Attitudes
PCC	• Population • Concept • Context	**P**: Pediatric patients with sleep disturbance **C**: Quality of life **C**: After tonsillectomy surgery

SPICE	• **S**etting • **P**erspective • **I**ntervention • **C**omparison • **E**valuation	**S**: Pediatric hospital rooms **P**: Pediatric patients **I**: Therapy dog visits **C**: No therapy dog visits **E**: Reduced anxiety
SPIDER	• **S**ample • **P**henomena of Interest • **D**esign • **E**valuation • **R**esearch type	**S**: Young parents **P** of **I**: Early Literacy programs **D**: Survey **E**: Experiences **R**: Qualitative

These frameworks aid in identifying the important parts (i.e., concepts) that can be used in formulating a research question. Below are two examples using the PS and PEO frameworks.

Example

Can you think of a research question using these identified PS concepts?

Population/Problem: Family members' of dying loved ones

Situation: Placing them in palliative care

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> https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=56#h5p-8

Example

Can you think of a research question using these identified PEO concepts?

Population/Problem: Caregivers of family members in palliative care

Exposure: Psycho-educational group intervention

Outcomes/Themes: Improved quality of life

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Is My Question Too Narrow or Too Broad?

When trying to settle on a research question, ensure you are choosing something of interest, but not so narrow that you are unlikely to uncover any information, but not too broad so that you are overwhelmed with content and don't know where to start. Below are examples of too broad and too narrow questions and an explanation to help understand why.

Example

Why is this example too broad a question?

"A systematic review of the literature on palliative care interventions."

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Example

Why is this example too narrow a question?

"Effectiveness of early reading intervention programs for children aged 5-7 in the private school system in East Toronto."

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A pre-search will assist you with this step. If you need a refresher on conducting a pre-search, see Module 1: Types of Reviews. Once you have a good understanding of the existing literature, you will be able to confidently formulate your research question.

Key Takeaways

Keep in mind that your question may change over time as you delve deeper into the literature. This is a normal course of events. You are still in the outline stage! Part of the process is refining and leading to sharper focus as you learn. For guidance on developing the research question see the further reading section.

10.

Identifying **keywords,** (also known as **search terms**) is important for effective literature searching. Your search terms are terms that will appear somewhere within the resource (e.g. title, abstract, or author keywords).

You can identify search terms from your research question by highlighting, underlining or circling the main ideas that must appear in the article. Your search concepts are ***the most important words in your research question***.

Example

What are the keywords you identify within this research question?

"What is the relationship between flexible work schedules and staff retention?"

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> *https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=58#h5p-12*

Keywords are easier to identify once the research question has been formulated using one of the stated frameworks (e.g. **PICO** or **PS**) listed in Table 2.2 of <u>Formulating a Research Question.</u>

Below is an example of how to use the **PICO(T)** framework to identify search concepts for a specific research question.

Example

Say you have the following research question: How effective is cognitive behavioural therapy in improving mild-to-moderate depression in adolescents? Let's break down the formula components by concept.

Formula component	Concept
Patient, **P**opulation or **P**roblem (**P**)	Adolescents with mild-to-moderate depression
Intervention (**I**)	Cognitive behavioural therapy
Comparison, **C**ontrol Intervention (**C**)	There is no concept here
Outcome (**O**)	Symptom reduction

Be aware that not all questions will include each of the framework's components. For example, the above question does not have a comparison, so there is no Comparison/Control Intervention (C) concept. Also, many experts advise that when conducting a systematic review, you should be careful about specifying a search term for "outcome." It can result in considerably lower results and produce bias in your study.[1]

Learning Activity

Identify Search Concepts

1. [citation Frandsen, T. F., Nielsen, M. F. B., Lindhardt, C. L., & Eriksen, M. B. (2020). Using the full PICO model as a search tool for systematic reviews resulted in lower recall for some PICO elements. Journal of Clinical Epidemiology, 127, 69-75.]

Drag and drop the correct search terms using PICO (Patient/Population/Problem, Intervention, Comparison/Control, Outcome) for the following research question:

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https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=58#h5p-13

11.

Your search strategy can contain your **main keywords**, **similar or related keywords** and **controlled terms** (also called **subject headings**).

Searching by a keyword will retrieve resources where the author(s) used that specific term. For this specific reason, you should also brainstorm **similar or related keywords** to incorporate into your search.

Methods for Identifying More Keywords

You can identify more keywords in multiple ways. Below are two methods.

Method 1: Use a Concept Model or Map

To use this method:

1. Write your research topic or question, along with any ideas and concepts associated with it on a blank sheet of paper.
2. Use themes to group your ideas, and connect related concepts using lines.
3. Remember to include the following:

    ◦ Synonyms
    ◦ Acronyms
    ◦ Brand names and generic names
    ◦ Variation in spelling (e.g. "paediatric" or "pediatric")

Please see Figure 2.1 below for an example where your research question is "How effective is cognitive behavioral therapy in improving mild-to-moderate depression in adolescents?"

Figure 2.1. Example of a "Concept Map" to generate more keywords. Source: Jo-Ann Petropoules. Licensed under Creative Commons CC BY 4.0

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https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=62#h5p-14

Method 2: Use Your Main Keywords in a Database

To use this method:

1. Locate an article on your topic.
2. Scan the title, abstract, and author keywords to identify more **keywords** (see Figure 2.2 below) to use in your search.

Double-Blinded Randomized Pilot Clinical Trial Comparing Cognitive Side Effects of Standard Ultra-Brief Right Unilateral ECT to 0.5 A Low Amplitude Seizure Therapy (LAP-ST)

Nagy A. Youssef,[1,2,*] William V. McCall,[1] Dheeraj Ravilla,[1] Laryssa McCloud,[1] and Peter B. Rosenquist[1]

▸ Author information   ▸ Article notes   ▸ Copyright and License information   Disclaimer

Abstract

Go to: ☑

Background: Concerns over cognitive side effects (CSE) of electroconvulsive therapy (ECT) still limit its broader usage for treatment-resistant depression (TRD). The objectives of this study were to (1) examine the CSE of Low Amplitude Seizure Therapy (LAP-ST) at 0.5 A compared to Ultra-brief Right Unilateral (UB-RUL) ECT using Time to Reorientation (TRO) as the main acute primary outcome, and (2) to compare effects on depressive symptoms between the two treatment groups. Methods: Participants were referred for ECT, consented for the study, and were randomized to a course of LAP-ST or standard UB-RUL ECT. TRO and depression were measured by the Montgomery-Åsberg Depression Rating Scale (MADRS). Results: Eleven patients consented. Of these, eight with a current major depressive episode (MDE) of unipolar or bipolar disorders were randomized. TRO was faster for the LAP-ST (mean = 6.8 min; SE = 4.9) than standard RUL ECT (mean = 15.5 min; SE = 6.5). Depression improved similarly in the two arms of the study from baseline (MADRS: LAP-ST = 41.0; SE = 2.0, RUL = 39.0; SE = 3.8) to endpoint (MADRS score: LAP-ST = 8.0; SE7.2, RUL = 9.5; SE = 3.8). Conclusions: This pilot, randomized and blinded clinical trial, suggests that the LAP-ST (at 0.5 A) has faster reorientation and possibly lower CSE compared to standard RUL-UB ECT. Caution is advised in interpreting these results due to the small sample size of this pilot study. Thus, future studies with similar design are warranted for replicating these findings.

Keywords: electroconvulsive therapy, neurostimulation, seizure therapy, low amplitude seizure therapy, cognitive side effects, ECT, current titration, precision ECT, treatment-resistant depression, mood disorders

Figure 2.2. Example of how to find keywords in a journal article. From Youssef, N. A., McCall, W. V., Ravilla, D., McCloud, L., & Rosenquist, P. B. (2020). Double-blinded randomized pilot clinical trial comparing cognitive side effects of standard ultra-brief right unilateral ect to 0.5 a low amplitude seizure therapy (lap-st). Brain Sciences, 10(12), 97. Licensed under a Creative Commons CC BY 4.0.

Key Takeaways

Some databases like Ovid MEDLINE, PubMed and EBSCO CINAHL use controlled vocabularies like MeSH as well as keywords. The next section will explain what controlled vocabularies are and how to use them. If you know you are going to use a database with controlled vocabularies, please check out the next section.

Learning Activity

Brainstorm more concepts

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https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=62#h5p-15

12.

Controlled vocabularies are a standardized set of terms used to describe the content of a resource in a database. This is known as **indexing**. Using controlled vocabulary terms will usually **generate fewer and more relevant results**. However, you must know the exact term/vocabulary to use. An example is provided below.

Example

Articles on **cancer** research can include terms like: tumour, cancer, or neoplasm. In Ovid MEDLINE, the controlled vocabulary for these terms is **Neoplasms**.

By searching for **Neoplasms** you should retrieve all the articles where the author(s) used the terms tumour, cancer, or neoplasm (as long as they have been properly indexed).

When to Use Controlled Vocabularies

The following are situations in which you would use controlled vocabularies:

1. If your keyword searching is **giving you too many or too few results**, try using controlled vocabulary terms.
2. If you are doing a comprehensive search (e.g., a systematic review), you should **combine both keywords and controlled vocabulary terms to increase the number of resources retrieved.**

How to Use Controlled Vocabularies

Search strategies must be customized for each database for a number of reasons, one of which is that they use

different controlled vocabularies. The tutorials in Table 2.3 below cover how to use controlled vocabularies in specific databases. Review these tutorials if you'd like to learn more.

Table 2.3. Databases and Controlled Vocabulary Tutorials

Database	Controlled Vocabulary	Tutorial
Ovid MEDLINE and PubMed	MeSH	[MeSH tutorial](#)
APA PsycInfo	APA Thesaurus	[APA PsycInfo Tutorial](#)
EBSCO CINAHL	CINAHL Subject Headings	[CINAHL Tutorial](#)
Ovid Embase	Emtree	[Embase Tutorial](#)

Key Takeaways

Databases like GEOBASE or Social Sciences Abstracts do not automatically identify relevant controlled vocabularies. Instead, you need to search the database's thesaurus or browse their list of controlled terms. Consult the database's help page, or contact your library for assistance.

How to Find More Controlled Vocabulary

Below are the steps to follow when finding more controlled vocabularies:

1. **Search for each keyword in a database separately. This will allow you to identify additional controlled vocabulary.** For example, the database PubMed allows you to [search for MeSH headings one at a time](#).

   ◦ The [CADTH Search Filters Database](#) can also help you look up the MeSH heading across databases such as Scopus, CINAHL, PubMed, PsycInfo, MEDLINE and Embase.

2. **Find an article on your topic and look at the controlled vocabulary assigned to it.** For example, in PubMed, look for the heading "MeSH" (the name for the controlled vocabulary in PubMed) under the heading of "Cited by." See Figure 2.3 below for an example.

3. **In other databases, such as Social Sciences Abstracts, find an article on your topic and look for the heading "Subjects" to help identify relevant controlled vocabularies.**

Episodic and chronic migraine in children

Paul E Youssef [1], Kenneth J Mack [1]

Affiliations + expand
PMID: 31463934   DOI: 10.1111/dmcn.14338
Free article

Abstract in English, Spanish, Portuguese

Migraine is the most common acute and recurrent headache syndrome in children. This condition has unique clinical characteristics in the pediatric population, that can evolve with age, and significantly impact a child's quality of life, affecting their education, socialization, and family life. The purpose of this review is to describe the varied clinical features of migraine seen in children, and discuss potential treatment options for pediatric migraine, including chronic migraine. In many patients a multifaceted approach involving lifestyle changes, treatment of comorbid conditions, and pharmacological treatments are needed for optimal headache control. WHAT THIS PAPER ADDS: Migraine presents as various phenotypes in children, sometimes evolving as the child ages. An expanded range of treatment options exists for the challenging chronic migraine patient.

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Similar articles

Management of Episodic Migraine in Children and Adolescents: a Practical Approach.
Rastogi RG, Borrero-Mejias C, Hickman C, Lewis KS, Little R.
Curr Neurol Neurosci Rep. 2018 Oct 31;18(12):103. doi: 10.1007/s11910-018-0900-0.
PMID: 30382405   Review.

Pediatric headache.
Winner P.
Curr Opin Neurol. 2008 Jun;21(3):316-22. doi: 10.1097/WCO.0b013e3282fe205b.

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Figure 2.3. MeSH terms in an article in PubMed. From Youssef, P. E., & Mack, K. J. (2020). Episodic and chronic migraine in children. Developmental medicine and child neurology, 62(1), 34–41. https://doi.org/10.1111/dmcn.14338. This screengrab, from PubMed National Library of Medicine (NLM) is included on the basis of fair dealing.

Key Takeaways

Not all search terms will map to an appropriate subject heading. If this is the case, search for it as a keyword. This option is available after the list of subject headings in most databases.

13.

The standard method of constructing a search strategy is to use **Boolean logic**. Boolean relies on three essential operators, AND, OR and NOT. Using these operators allows you to combine words and phrases using the words AND, OR, NOT to limit, broaden, or define your search. A good researcher should know how to do a Boolean Search.

Boolean Operators

Boolean operators connect your search concepts and search terms (i.e., controlled vocabulary and keywords) together. The three basic operators are: OR, AND, and NOT. An example is shown below, followed by a deeper dive into each of these operators.

Example

(Cognitive Behavioral Therapy **OR** CBT) **AND** Depression

The OR Operator

The OR operator broadens your search results by retrieving records that contain either or both of your search terms or concepts. Usually, terms within a concept are combined using the Boolean OR operator.

In the Figure 2.4 below, the database will retrieve records that contain **either or both of the terms Cognitive Behavioural Therapy OR CBT.**
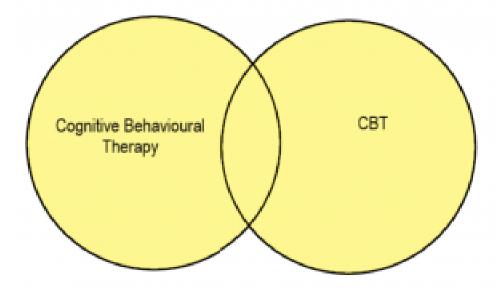
Figure 2.4. Example of the "OR" operator in Boolean.

The AND Operator

The AND operator narrows the search results by retrieving records that contain both of your search terms or concepts. Usually, different concepts are combined using the Boolean AND operator.

In the Figure 2.5 below, the database will retrieve sources that contain **Cognitive Behavioural Therapy AND Depression**
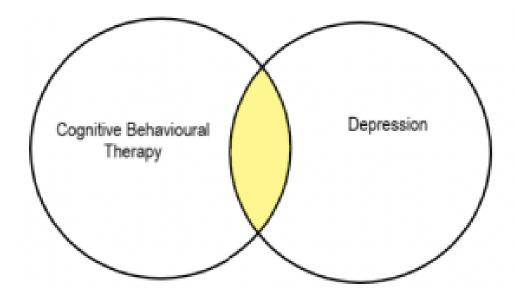

Figure 2.5. Example of the "AND" operator in Boolean.

NOT

The NOT operator narrows the search results by eliminating a specific search term. You should ***use the NOT operator with caution***. This is because it can eliminate relevant results that happen to mention the term you are "noting" out. In Figure 2.6 below, any articles that mention both adult and adolescent will be excluded from the result set.
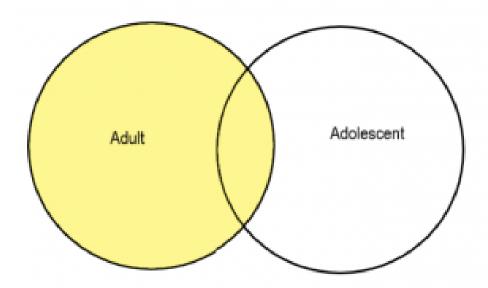

Figure 2.6. Example of the "NOT" operator in Boolean.

Key Takeaways

Depending on the search engine (e.g., Google Scholar) or database (e.g., PubMed), the operator(s) may be required to be entered in upper case letters. Consult the search engine's or database's Help information or Search Tips for details about how to enter the Boolean Operators.

Learning Activity

Test your Boolean Knowledge

> ⧉ *An interactive H5P element has been excluded from this version of the text. You can view it online here:*
> *https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=66#h5p-16*

Using Truncation and Wildcards

Truncation and **wildcards** can be applied to a keyword search to broaden your results and allow you to look for variations of words.

Truncation

You can use the truncation symbol to avoid typing out all possible variations of a word. For example, **surg*** will retrieve surgery, surgeries, surgeon, or surgical. The truncation symbol should be used with caution to ensure relevant words are being retrieved.

The most common symbol used is an asterisk (*). The asterisk symbol is used in the following platforms and databases:

- EBSCO (e.g., CINAHL, Business Source Complete)
- Ovid (e.g., MEDLINE, Embase, PsycInfo)
- ProQuest
- ERI,
- PubMed
- Web of Science

Wildcard Symbols

Wildcard symbols can be used to substitute for one or more characters, or any single character. This is useful when dealing with variant spelling (e.g., pediatric and paediatric). One of the most common symbols used is the **question mark (?)**. For example, in the Ovid database, **p?ediatric*** will retrieve pediatric OR paediatric OR pediatrics OR paediatrics.

Databases use different wildcard symbols, so check the database *Help* information or *Search Tips* for details about which symbol to use.

14.

When conducting a review, it is important to search multiple resources. Just searching one subject database will not ensure you have found all the essential sources on your topic.

For systematic reviews, searching multiple databases is essential for **reducing bias** in your results. Only using one database like PubMed means you have ignored relevant studies found in other databases like Embase.

Subject Databases

Subject databases are accessible through your academic library and contain published material belonging or pertaining to a specific discipline or multiple disciplines, e.g.,health sciences, business, social work, or law. Many subject databases are hosted on the platforms **EBSCO** and **Proquest** for example. These search platforms allow users to search and retrieve content, and may look and work similarly to each other. The type of material in different subject databases depends on the subject, but most will include academic peer-reviewed articles, newspaper and magazine articles, and reports.

To find a subject specific database, go to your library's website and look for a research guide for your discipline. This guide will include a list of article databases for your discipline, and the descriptions below them will help you select among them. Alternatively, look for a list of databases by subject on your library website, and choose an article database which covers your subject.

If you have questions about which database to choose, contact your librarian for help.

Key Takeaways

There are also free options if you are not affiliated with an academic library. Public libraries have some databases you may search with a library card. Also, there are some free databases online such as PubMed (health sciences subjects), DOAJ (general subjects), Dimensions (general subjects) and Google Scholar (general subjects). Further free (Open Access) resources are listed on this Open Access Educational Resources Guide.

How to Search in Subject Databases

In general, all subject databases will have a basic search box and an advanced search box. We recommend you use the **advanced search box,** as it provides more options to optimize your search. The advanced search box will often allow you to choose where you want your keywords to appear within the resource (e.g., in the title or the abstract and body or anywhere). An example of an advanced search box is found in Figure 2.7 below.
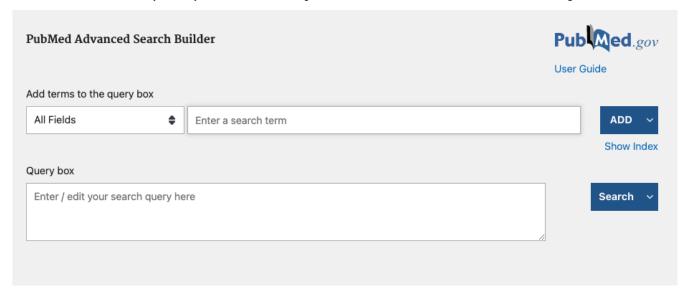

Figure 2.7. Example of an advanced search box in PubMed. This screen grab, from PubMed National Library of Medicine (NLM) is included on the basis of fair dealing.

Limiters are found in all subject databases and they allow you to limit your search by date, type of source, language, and in some databases by population and methodology (see Figure 2.8 below). This is particularly useful if you are conducting a systematic review, as the limiters will help with your exclusion criteria.
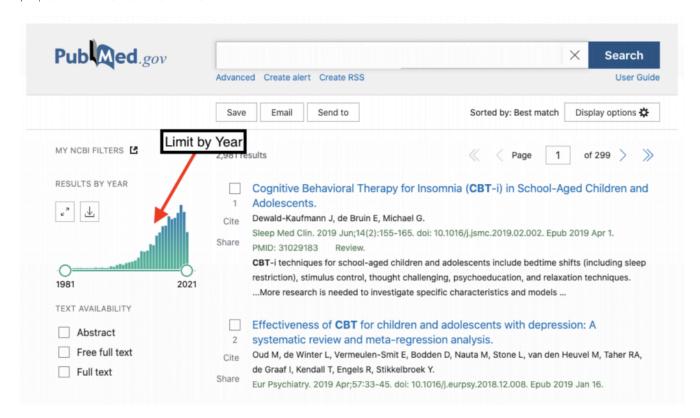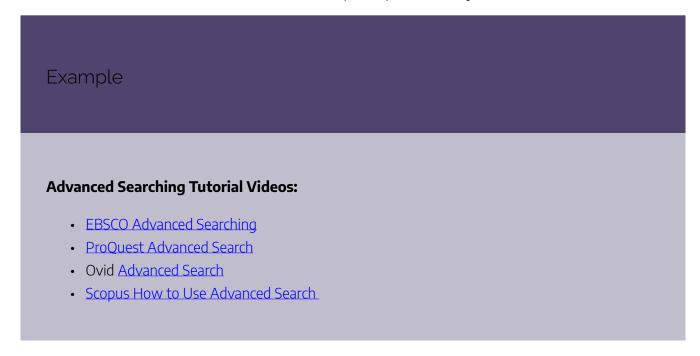
Figure 2.8. Example of date range limits in PubMed. This screen grab, from PubMed National Library of Medicine (NLM) is included on the basis of fair dealing.

Once you have chosen your subject databases, take a note if they are owned by a particular platform (i.e., EBSCO, ProQuest, Ovid, etc). Each of these platforms will have tutorials on how to conduct an advanced search. Below are video tutorials from some of the major subject database platforms.

Example

Advanced Searching Tutorial Videos:

- EBSCO Advanced Searching
- ProQuest Advanced Search
- Ovid Advanced Search
- Scopus How to Use Advanced Search

- Web of Science Advanced Search

Google Scholar

Google Scholar searches articles, theses, books, abstracts and court opinions, from academic publishers, professional societies, online repositories, universities and other web sites.

The majority of sources will be behind pay-walls and you will not be able to access them. However, you can optimize Google Scholar to search your academic library's collection, at which point you will be able to access any item your library owns. For a list of the pros and cons of using Google Scholar please see **Table 2.6.**

Table 2.6. The Pros and Cons of Using Google Scholar

Pros	Cons

• Familiar Google interface – easy to search
• Very broad coverage
• Integrated citation information and author profiles
• Results can be linked to your library collection
	• Limited search capabilities and very large result sets make precision searching impossible, e.g.;:
	  ◦ No subject headings
	  ◦ Limited sorting and filtering options
	  ◦ Algorithm-based (takes the control out of the searcher's hands)
	• Not clear how "scholarly" is defined (leads to some questionable results)
	• Lacks the focus and quality control present in other scholarly databases

From McMaster University, Health Science Library, Google Scholar. Licensed under Creative Commons CC BY-NC-SA 4.0.

How to Search Google Scholar

The following video demonstrates how you can search Google Scholar.

UTS Library, Google Scholar: Advanced Searching [2:53]. Licensed under a Creative Commons CC BY 4.0. Closed Captions

Grey Literature and Other Sources

Grey literature refers to any information that is not commercially published, and can include a wide range of material types, such as:

- Theses and **dissertations**, e.g., databases such as Proquest Dissertations or Theses Canada
- Government documents and websites
- Clinical trials registries
- Conference proceedings, e.g., databases such as Scopus or Web of Science include citations to conference proceedings
- Research reports

How to Search Grey Literature

Knowing where to search for grey literature can be challenging. There are a variety of suggestions in the following library guide from Simon Fraser University: Grey literature: What it is & how to find it.

A good approach is to be strategic and consider where appropriate grey sources might be located. For example, if you know of any government agencies, non-profits, professional associations, research institutes, and other organisations that may be producing content relevant to your topic, you may wish to search their website for any publications and reports. At a very minimum, looking at graduate theses and dissertations and conference proceedings (often sites of emerging research) should be a component of your grey literature search.

Searching for grey literature will likely involve the use of a search engine such as Google, so it will be important for you to critically evaluate sources before including them in your research. For some tips on avoiding fake news and the spread of misinformation, review the following guide from Toronto Metropolitan University Library: How to Identify Fake News.

Replicating Your Search Strategy Across Different Databases

Your search strategy will need to be "translated" for use in multiple databases and you will have to look out for the following:

- Controlled vocabulary can vary across databases, e.g., MEDLINE uses MeSH while Embase uses Emtree
- Search options, limiting options, and availability of search fields will differ between databases

Translating Search Strategies for Systematic Reviews

Systematic reviews require you to use the same search strategy across different databases. However, as mentioned above, different subject databases might not allow you to use the exact same search.

Consider the steps below on how to translate your search strategy from one database to another[1]:

1. Open the database in which you created your first (original) search strategy, e.g., Ovid MEDLINE. This will serve as a guide to translating your strategy into the other database(s).
2. Open the database you wish to translate your search into, e.g., Ovid Embase, CINAHL, Ovid PsycINFO.
3. In the search box of the new database, e.g., Ovid Embase, enter the first term or phrase from your original strategy, e.g., Ovid MEDLINE.
4. Identify and search on the relevant controlled vocabulary. Here are a few notes:

   - Remember, controlled vocabulary vary across databases
   - An equivalent controlled vocabulary may not exist across databases. In such situations, it is recommended that you search it as a keyword.
   - For all keyword or phrase searches, check to see if there is a controlled vocabulary in the new database, regardless of whether the equivalent exists in the original search strategy.

5. Repeat step 4 for subsequent terms or phrases from the original search.
6. Remember that searching is an iterative process. Revise your initial search strategy if you find a unique term in subsequent databases.

---

1. From McMaster University Library, How to Search the Literature (Advanced). Translate a Search Strategy.

15.

Besides your standard search there are additional options to identify relevant sources including searching key journals in your field, and tracking the work of relevant authors.

Another method used by researchers is to **consult the citations within an article.** By consulting the citations you can find relevant titles that you might have missed in your search. The advantage of this method is that you can find sources about a subject quickly and relatively easily. The disadvantage of this method is that you are searching backward, or retrospectively, so each source you find will be older than the previous one.

This is why you need to use a forward citation searching method in combination with your backward citation search. In the forward searching method, researchers use tools within databases like Google Scholar and Web of Science to **see who has recently cited your source**. This way you can find new and relevant sources.

Method 1: Backward Searching

In this method, review the references used in key articles. For example, search through the article for the "References" section as in Figure 2.9 below.

Abstract

Cognitive-behavioural therapy (CBT) is an effective treatment for depressed adults. CBT interventions are complex, as they include multiple content components and can be delivered in different ways. We compared the effectiveness of different types of therapy, different components and combinations of components and aspects of delivery used in CBT interventions for adult depression. We conducted a systematic review of randomised controlled trials in adults with a primary diagnosis of depression, which included a CBT intervention. Outcomes were pooled using a component-level network meta-analysis. Our primary analysis classified interventions according to the type of therapy and delivery mode. We also fitted more advanced models to examine the effectiveness of each content component or combination of components. We included 91 studies and found strong evidence that CBT interventions yielded a larger short-term decrease in depression scores compared to treatment-as-usual, with a standardised difference in mean change of -1.11 (95% credible interval -1.62 to -0.60) for face-to-face CBT, -1.06 (-2.05 to -0.08) for hybrid CBT, and -0.59 (-1.20 to 0.02) for multimedia CBT, whereas wait list control showed a detrimental effect of 0.72 (0.09 to 1.35). We found no evidence of specific effects of any content components or combinations of components. Technology is increasingly used in the context of CBT interventions for depression. Multimedia and hybrid CBT might be as effective as face-to-face CBT, although results need to be interpreted cautiously. The effectiveness of specific combinations of content components and delivery formats remain unclear. Wait list controls should be avoided if possible.

Keywords: Cognitive-behavioural therapy; depression; multimedia; network meta-analysis; systematic review.

Figure 2.9. Example of backward citation searching in PubMed by looking at the "References" section of an article. This screen grab from PubMed , National Library of Medicine (NLM) is included on the basis of fair dealing.
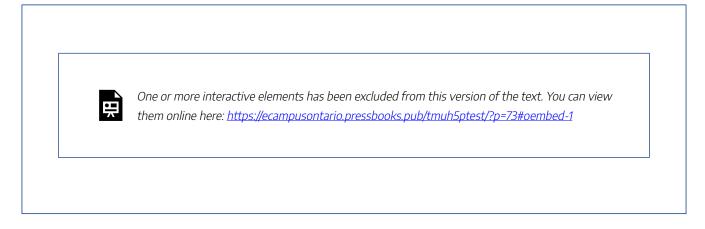
Method 2: Forward Searching

In this method, see what articles have cited your key articles. For example, search through the "Cited by" section of the article as in Figure 2.10 below.

Abstract

Cognitive-behavioural therapy (CBT) is an effective treatment for depressed adults. CBT interventions are complex, as they include multiple content components and can be delivered in different ways. We compared the effectiveness of different types of therapy, different components and combinations of components and aspects of delivery used in CBT interventions for adult depression. We conducted a systematic review of randomised controlled trials in adults with a primary diagnosis of depression, which included a CBT intervention. Outcomes were pooled using a component-level network meta-analysis. Our primary analysis classified interventions according to the type of therapy and delivery mode. We also fitted more advanced models to examine the effectiveness of each content component or combination of components. We included 91 studies and found strong evidence that CBT interventions yielded a larger short-term decrease in depression scores compared to treatment-as-usual, with a standardised difference in mean change of -1.11 (95% credible interval -1.62 to -0.60) for face-to-face CBT, -1.06 (-2.05 to -0.08) for hybrid CBT, and -0.59 (-1.20 to 0.02) for multimedia CBT, whereas wait list control showed a detrimental effect of 0.72 (0.09 to 1.35). We found no evidence of specific effects of any content components or combinations of components. Technology is increasingly used in the context of CBT interventions for depression. Multimedia and hybrid CBT might be as effective as face-to-face CBT, although results need to be interpreted cautiously. The effectiveness of specific combinations of content components and delivery formats remain unclear. Wait list controls should be avoided if possible.

Keywords: Cognitive-behavioural therapy; depression; multimedia; network meta-analysis; systematic review.

PAGE NAVIGATION

< Title & authors

Abstract

Figures

Similar articles

Cited by

References

Publication types

MeSH terms

Related information

Grant support

LinkOut - more resources

Figure 2.10. Example of forward citation searching in PubMed. This screen grab from PubMed , National Library of Medicine (NLM) is included on the basis of fair dealing.

Many databases will include live links to an article's references, as well as live links to other articles that have cited that article. The following video demonstrates how to do citation searching in Google Scholar:

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=73#oembed-1

CSUDH Library. Citation Tracking. Licenced under Creative Commons CC BY 4.0. Closed Captioned

16.

If this is your first review, it's normal to feel overwhelmed and unsure when to stop the searching process. Afterall, you don't want to miss anything that's possibly relevant, so the searching process never really seems to come to an end!

Unfortunately, we don't have a firm easy answer like "if you find 10 articles you can stop." There is always a chance that an article might slip past your extensive searching, but if you have done the steps below, then the chances of a really important article slipping past you is pretty slim.

Tips on When to Stop Searching

1. **Determine that your search strategy is working.** You'll know it is working when your search results include major studies/sources that have been recommended or, after a quick analysis of a few articles, you can tell they meet your criteria.
2. **You have searched all relevant databases.**
3. **You used the citation searching techniques** (See previous section). When using these methods you should see studies that you've already found in your database search and some new ones.
4. **You decided to add in some new search terms to a database search strategy and it yielded no new sources.**
5. **You decided to remove a search term and the major studies you've found in previous searches have disappeared on the results page.**

17.

Your search process must be documented in enough detail to ensure that it can be reported correctly in the systematic review and reproduced for verification. During your search process you will have to **keep track of**:

- Each database and platform (PsycINFO, PubMed, Medline etc) searched
- Date each search was conducted
- Subject headings and keywords used (including whether terms were exploded, truncated, etc)
- Number of results retrieved for each search within each database
- Total number of records over all
- Number of duplicates identified
- Numbers pre-screening and post-screening

Documentation Templates

In Module 1 we learned that PRISMA is an evidence-based minimum set of items for reporting in systematic reviews and meta-analyses. The **PRISMA** Group has developed an extension to PRISMA to assist researchers in documenting their literature searches for systematic reviews. The checklist identifies what to document in terms of information sources and methods, search strategies, peer review, and records management. The PRISMA flow diagram demonstrates how to document your final numbers.

Example

Take a moment to review the checklist and the flowchart and save a copy for your own review.

- PRISMA Checklist (docx)

18.

Complete **Activity 2.1: "Create Your Own Search Strategy"** in your Research Roadmap Workbook

This exercise allows you to document your search strategy. Don't worry if you are still trying to figure out some of the important details about your review as you can use this exercise to document what you have in mind.

For more information please see Workbook Instructions in the Introduction Module.

19.

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https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=81#h5p-17

20.

We've come to the end of this module. Below are the key points that we hope you will take away from the topics covered:

- Your research question can be qualitative or quantitative.
- A formula like PICO(T) can assist you in creating your question and identifying your key search terms.
- Your search terms can include related words and the controlled vocabulary of the subject database.
- Using Boolean operators will help you put your search terms together in a coherent search strategy.
- Subject databases have limiters that will help you filter your search results.
- Use search techniques like citation searching to make sure you have found relevant sources.
- If you have a working search strategy, have searched all your identified resources and used citation searching techniques, you can stop searching and start analyzing.
- You need to document your search process.
- In some cases, more in-depth assistance is required and you can book a research consultation with your subject librarian to review your initial search.

21.

Constructing a Question

Alvesson, M., & Sandberg, J. (2013). *Constructing research questions: Doing interesting research.* SAGE.

Boland, A., Cherry, M. G., & Dickson, R. (2017). Chapter 3 in *Doing a systematic review: A student's guide* (Second ed.). SAGE.

DeCarlo, M (2018) Chapter 8: Creating and refining a research question in *Scientific Inquiry in Social Work*. Open Social Work Education. https://scientificinquiryinsocialwork.pressbooks.com/

Denney, A. S., & Tewksbury, R. (2013). How to Write a Literature Review. *Journal of Criminal Justice Education, 24*(2), 218–234. https://doi.org/10.1080/10511253.2012.730617

Thomas J, Kneale D, McKenzie JE, Brennan SE, Bhaumik S. (2021, February). Chapter 2: Determining the scope of the review and the questions it will address. In Higgins J.P.T, Thomas J, Chandler J, Cumpston M, Li T, Page M.J, Welch V.A. (Eds). *Cochrane Handbook for Systematic Reviews of Interventions version 6.2*. Cochrane. https://training.cochrane.org/handbook/current/chapter-02

How to Search

Lefebvre C, Glanville J, Briscoe S, Littlewood A, Marshall C, Metzendorf M-I, Noel-Storr A, Rader T, Shokraneh F, Thomas J, Wieland LS. (2021, February). Chapter 4: Searching for and selecting studies.In Higgins J.P.T, Thomas J, Chandler J, Cumpston M, Li T, Page M.J, Welch V.A. (Eds). *Cochrane Handbook for Systematic Reviews of Interventions version 6.2*. Cochrane. https://training.cochrane.org/handbook/current/chapter-04

Sayers, A. (2008). Tips and tricks in performing a systematic review. *British Journal of General Practice, 58*(547), 136-136. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2151802/

Controlled Vocabularies

The National Library of Medicine (2013, February 14). Use MeSH to Build a Better PubMed Query [Video]. YouTube. https://www.youtube.com/watch?v=uyF8uQY9wys

UTS Library (2021, February 23). *Medline Ovid: Advanced Searching* [Video]. YouTube https://www.youtube.com/watch?v=6QQ0MW_jXfM

CADTH Search Filters Database: https://searchfilters.cadth.ca/

Documenting Your Search With PRISMA-S (Systematic Reviews)

Rethlefsen ML, Kirtley S, Waffenschmidt S, Ayala AP, Moher D, Page MJ, et al. PRISMA-S: An extension to the PRISMA Statement for reporting literature searches in systematic reviews. *Systematic Reviews.* 2021;10(1):39. https://dx.doi.org/10.1186/s13643-020-01542-z

PART IV
MODULE 3: ORGANIZING, MANAGING AND SCREENING SOURCES

22.

Group members studying together. From Flicker user Archivists Round Table. Licensed under Creative Commons CC BY-ND 2.0

After you have conducted your search, you will be confronted with the dilemma of what to do with your results. It is not unheard of for searches to produce hundreds if not thousands of results to shift through. Your next steps will be to download your results, save them somewhere you can manage them and finally **screen** them to pick the ones you will be keeping in your review.

At this point you should work out a plan for how you will organize your results. Staying organized and managing your results will require a new set of organizational skills, plus these skills will help protect you from accidental **plagiarism** or **bias**.

Learning Outcomes

By the end of this module, you will be able to:

1. Export your search results.
2. Develop a plan to pick a citation management or systematic review tool.
3. Screen your search results and pick relevant sources for your review.
4. Recognize how to avoid plagiarism and demonstrate the rules of your chosen citation style.

23.

In any literature or systematic review project, exporting and saving results from databases is an important step prior to selecting your final sources. Exporting and saving results allow you to **permanently store the important bibliographic information** or 'metadata' attached to your articles – this could include the author name(s), article title, journal title, etc., the article abstract, and any associated keywords.

Exporting

The majority of the databases that you will likely be using for your review will have options to export your references. Some important tips when exporting large amounts of records:

- **Export your records as an .ris file type,** which will allow you to then upload these records to citation managers or systematic review software.
- **Look for options to include the article abstracts when exporting**, as this will be important for the first level of screening.
- For **systematic reviews**: When selecting your records for export, look for options to Select All – depending on the database, you may have to export your references in batches, if there are limits on the number that you can export at a time.

Example

The following video is an example of how to save and export results in EBSCO CINAHL.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=90#oembed-1

[Exporting from EBSCO CINAHL](). University of East Anglia Library. Licensed under a Creative Commons [CC BY 4.0](). *Note this video does not have closed captions, a transcript has been provided below.

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Learning Activity

Complete the following steps to practice exporting search results:

1. Go to your library's website and open a subject database you have used in the past, alternatively you can use [PubMed]() (which does not require library access).
2. Perform a quick search on a topic of your choice.
3. Familiarize yourself with the exporting options in your database, look for the export button.
4. Take note of the export styles available.

Create an Account to Save Results

Many database interfaces like EBSCO, OVID and ProQuest allow users to **create a personal account**. With an account you can **save your searches including any keywords, MeSH terms or limiters you used**. This

means you can return to your account at any time to re-run your search or modify your search and **run the search again**. See Table 3.1 below on how to set up an account for the following major database vendors (always check with your library to see which databases are available to you as a patron).

Table 3.1. Instructions on Creating a Personal Account to Save Your Search

Database Vendor	Instructions on Setting Up an Account
EBSCO	How to Create & Manage my EBSCOhost account
ProQuest	My Research Account
OVID	Creating a OVID account
Web of Science	Register for an an email

Key Takeaways

Get to know the exporting features of your chosen databases and sign up for an account with each database. This will not only save your results and search history, it will save you time if you have to re-do your search.

24.

After exporting your results, you will need to store and organize them. Since you will be dealing with a large amount of sources, it's advisable to use some sort of citation management tool.

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A **citation** tool is especially useful If you are conducting a systematic review. As part of your review, you need to document aspects of your search like the number of sources you retrieved per database, the number of duplicates and the final number of articles you choose to review. For more information, please see the PRISMA Checklist in Module 2.

> **Caution:** Citation management tools are useful but can produce inaccurate citations. You will need to double check the accuracy of the citation generated by the tool. Therefore, knowing the rules of your citation style is equally important.

Example

The following video provides a quick overview of how a reference management tool works.

> One or more interactive elements has been excluded from this version of the text. You can view them online here: *https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=92#oembed-1*

[Reference Management Software: How it Works and What it Does](). University of York Library. Licensed under a Creative Commons [CC BY 4.0](). Closed Captions

25.

Picking a Citation Management System

When picking a tool, we suggest trying out a few in order to compare their features. You might also want to keep the following questions in mind when trying them out:

- Is the tool within my budget?
- Does it work well with the databases I use frequently?
- Is it able to organize and filter a large number of citations?
- Can it produce a **bibliography** in the primary style used in my discipline?
- If I'm working with a research team, does the software allow me to collaborate with my colleagues smoothly?

Example

If you are interested in a more comprehensive list of citation management tools available worldwide, please see the following chart from Wikipedia: Comparison of Reference Management Software.

Simple Solution: Using Excel/Google Sheets/ Numbers

If you have a **small and manageable number of sources, you can use a familiar spreadsheet program** like Excel, Google Sheets or Numbers to manage your citation data and look for duplicates. You can create your own columns for important citation information like Author, Title, Year, Database, etc. and even a column to enter notes. You can enter your sources manually or use the exporting function found in most databases. For

example, databases like PubMed and ProQuest allow you to export the bibliographic information attached to your sources as a .CSV file. This file can be opened as a spreadsheet in Excel, Google Sheets and Numbers. See Figure 3.1 below for an example of a spreadsheet used as a citation management tool.

Figure 3.1. Example of using a spreadsheet for citation management. Source: Kelly Dermody, licensed under a Creative Commons CC BY 4.0

Free Software

There are a number of free citation management tools available for you to use. The only requirement is that you sign up for an account and download the product to your device. **The three most commonly used tools are Mendeley, Zotero and EndNote Basic.** If you are having trouble picking between the three, Table 3.2 below offers a quick comparison chart. For a more in depth comparison you can use the following comparison chart from the University of Toronto Libraries to help you decide.

Table 3.2. Quick Comparison of Mendeley, Zotero and EndNote

Product	Mendeley	Zotero
Price	Free	Free and open source
Availability	Desktop and online	Desktop and online
Word processor	MS Word Plugin	MS Word and Google Doc Plugin
Features	• Web Importer bookmarklet for most browsers • Can save and annotate PDFs • Shared folders for collaboration	• Web Importer using Firefox, Chrome, or Safari plugin • Automatically import PDFs with citations, can add notes to PDFs • Shared folders for collaboration
Important links	• Create account • Download Reference Manager for Desktop • Download Mendeley Desktop • Help guide	• Create account • Download • Help guide

Paid Products

There are some important reasons for considering a paid product for your choice of citation management tool. They can **offer technical support if anything goes wrong, larger storage space, collaboration, duplication and other special features** that might meet your needs more than a free product. The following table offers a comparison of two popular paid products available on the market. Some libraries have institutional licenses to one or more of these products, which means as long as you are a student you will have access. Check with your library to see if you have access to these products. Table 3.3 below offers a quick comparison chart of two paid products, RefWorks and EndNote.

Table 3.3. Quick Comparison of Refworks and EndNote

Product	RefWorks	EndNote
Company	Product of Ex Libris, a ProQuest company	Product of Clarivate (owns Web of Sc
Availability	Web based	Desktop interface for Windows and M
Word Processor	MS Word and Google Docs plugin	"Cite While You Write" download for
Features	• Read and annotate full-text documents with highlights and comments. • Collaborate on projects with shared folders.	• Shared folders for collaboration. • Add EndNote Click to import P • Conduct large-scale literature rev • Deduplicate content by searchin
Important Links	RefWorks Account	EndNote Account

Products Specifically for Systematic Reviews

Some citation managers may not be robust enough to handle a large evidence synthesis review or remove duplicate citations. Instead, you might need to **use a tool specifically designed for systematic reviews**. These tools incorporate automated features that help organize and speed up the review process.

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> *https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=95#h5p-19*

The Systematic Review Toolbox is a searchable collection of tools you could potentially use to develop your systematic review. Below is a sample of some free and paid tools designed for systematic reviews.

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> *https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=95#h5p-20*

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https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=95#h5p-21

Learning Activity

Complete the following steps to locate the tools available to you:

1. See what paid products your library offers. Bookmark the resource guides on using the product.
2. Take some time to try out 2-3 products before making a decision or a purchase.

Key Takeaways

Taking some time to pick a citation management tool that is right for you is an essential step in conducting a review. The right tool will help you maintain the integrity of your review and save you time.

26.

Complete **Activity 3.1: "Selecting Your Citation Management Tool"** in your Research Roadmap Workbook.

Now that you have been presented with an in-depth list of available tools. Take a moment to document at least 2-3 tools that you are interested in testing.

For more information please see Workbook Instructions in the Introduction Module.

27.

Screening is the process of identifying suitable sources from your literature search to be "full-text" screened and eventually included in the review. As mentioned in [Module 2](#), **your inclusion and exclusion criteria can help inform which limiters to apply to exclude irrelevant results,** e.g., publication year or language.

If you are conducting a systematic review, it is recommended to screen the results outside of the databases, as there will be duplication of records. A citation software tool or systematic review tool will aid in removing duplicates. Within the citation management or systematic review tool, you can screen the titles and **abstracts** to determine if articles are relevant, based on inclusion and exclusion criteria that could not be captured in your search strategy. Afterwards, the full-text must be retrieved and screened to determine inclusion.

Learning Activity

Screening Practice: In this activity, you are doing a review on the effectiveness of cognitive behavioural therapy in improving mild to moderate depression in teenagers. Your inclusion criteria includes:

- English language publications only
- Longitudinal studies
- Published in the last 20 years

Instructions:

First, screen the abstract to see if it fits your inclusion criteria. * Don't click on the plus symbols yet.*

Then, when you are ready, click on the plus symbols to find out if this article fits with your inclusion criteria.

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Abstract of Kroll, L., Harrington, R., Jayson, D., Fraser, J., & Gowers, S. (1996). *Pilot study of continuation cognitive-behavioral therapy for major depression in adolescent psychiatric patients.* Journal of the American Academy of Child and Adolescent Psychiatry, 35(9), 1156–1161. https://doi.org/10.1097/00004583-199609000-00013 This screen grab from PubMed , National Library of Medicine (NLM) is included on the basis of fair dealing.

28.

Complete **Activity 3.2: "Inclusion and Exclusion List"** in your Research Roadmap Workbook.

This exercise allows you to document your criteria. Don't worry if you are still trying to figure out some of the important details about your review as you can use this exercise to document what you have in mind.

For more information please see <u>Workbook Instructions</u> in the Introduction Module.

29.

For systematic reviews, it is recommended that at least two reviewers screen the results independently. This is to help resolve disagreement by encouraging consensus and reduce the risk of biased decisions. When needed, a third reviewer can aid in resolving the deadlock.

Screening the Title and Abstract

For the first screening, each member of the team will independently scan the titles and abstracts of articles, and make a decision whether to include or exclude studies. Each reviewer should be asking themselves, "Is there enough information in the title and abstract to exclude this study at this stage?" To make sure both reviewers are on the same page, they will need to ensure they have a clear and pre-defined inclusion and exclusion criteria.

Tips for screening the title and abstract:

- You can be over-inclusive at this stage.
- A "maybe" can be a yes at this point.
- Do not screen for outcomes in the abstract or title.

Screening the Full-Text

The next step is to read the full-text of the articles selected from the first round. Again, the reviewers will do this independently and use the same inclusion and exclusion criteria. This stage involves a more rigorous and in depth look at the articles. The reason for excluding a study must be recorded for reporting purposes. Reviewers can also look at the outcome of a study and determine if it is significant enough to include.

How to screen in a citation software management tool with a partner:

1. Export your library after removing the duplicates and share it with your co-reviewer. This will ensure both screeners assess the literature independently.
2. Alternatively, see if the citation software manager allows for annotation. If there is only one field that allows for annotation, then each reviewer should consider a separate coding system for inclusion and exclusion.

How to screen in a systematic review tool with a partner:

1. These tools allow the owner of the account to invite others to participate in the screening process. They usually allow anonymous screening.

30.

As noted in Module 2, you will be expected to document your search process and your selection process. The PRISMA flow diagram will help you map out the number of records identified, included and excluded, and the reasons for exclusions.

Key Takeaways

Save a copy of the PRISMA Flow Diagram for your own review.

Addressing Bias in Selecting Sources for Systematic Reviews

Selection bias can happen consciously or unconsciously to a reviewer when selecting sources. Bias can appear in how and why we make decisions on the potential eligibility or ineligibility of a study. This is why using a team approach is one method to reduce bias in selecting sources for systematic reviews. Another is to make sure each reviewer has a clear understanding of the key concepts, or inclusion and exclusion criteria. For example, has the team checked to ensure everyone has the same understanding of the key concepts in their research question and what to include and exclude? This way, everyone goes into selecting with the same understanding.

Learning Activity

Your group is planning on using the following criteria. What bias or misinterpretation issues might be present within each one?

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> *https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=105#h5p-22*

Key Takeaways

Screening your citations and abstracts against your inclusion and exclusion criteria is the first step in identifying suitable studies. If you are conducting a systematic review, it is important to reduce selection bias by having a blind team based approach to screening.

31.

Complete **Activity 3.3: "Check for Team Understanding"** in your Research Roadmap Workbook.

Are there any search terms or items on your inclusion/exclusion list that might have multiple interpretations? Write them down with your own interpretation and have your team members do the same activity. Compare your interpretations to check for team understanding.

For more information please see <u>Workbook Instructions</u> in the Introduction Module.

32.

Plagiarism happens when you claim the words, ideas, or data of another person as if it is your own, without appropriate referencing. Plagiarism can range from copying an entire paper to changing only a few words and not citing the original source. It's important to familiarize yourself with what constitutes plagiarism. One way you can do this is to consult your institution's academic integrity policy so you know how to avoid a charge of plagiarism.

Citation Styles

When it comes time to write your review, you will need to demonstrate that you understand when and how to cite your sources. Keeping them organized will help you with this task. By using a citation management tool, you will be able to access your sources in one place and pull the **citation** information needed to cite them correctly. Before sitting down to write your review, make sure you familiarize yourself with the rules of your citation style. While it is true that some citation management tools will offer you a plug-in for your word processor that seemingly does all the work, it can make mistakes. Getting to know the rules yourself will save you a lot of time and reduce the risk of plagiarism. Table 3.4 below provides a curated list of citation style resources to help you familiarize yourself with the rules.

Table 3.4. Citation Style Help Resources

Style	Resource
APA	• [APA Style.org](#) from APA • [APA Style and Formatting Guide](#) from Purdue University Online Writing Lab (OWL) • [APA Citation Style Guide](#) from Concordia University Libraries
MLA	• [MLA Formatting and Style Guide](#) from Purdue University Online Writing Lab (OWL) • [MLA 9th Ed](#) from CSUDH University Library • [MLA Citation Style](#) from Concordia University Libraries
Turabian (Chicago)	• [Chicago Manual of Style 17th Edition](#) from Purdue University Online Writing Lab (OWL) • [Chicago Basic Style Guide](#) from Student Learning Support (Toronto Metropolitan University)
Vancouver (also known as ICMJE)	• [Citing and referencing: Vancouver](#) from Monash University Library • [ICMJE Recommendations Guide](#) from Brescia College University • [Citing & Referencing: Vancouver Style](#) from Imperial College
IEEE	• [IEEE Reference Guide](#) from IEEE Author Centre

Learning Activity

How much do you know about plagiarism? Take this quiz to find out.

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https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=109#h5p-23

This quiz is adapted from the University of Guelph, Academic Integrity Plagiarism Quiz. Licensed under a Creative Commons Attribution-NonCommercial 3.0 Unported License.

Key Takeaways

Familiarize yourself with the academic integrity policies of your institution to better understand how plagiarism is defined and how to avoid it. Commit to learning the rules or conventions of your chosen citation style.

33.

An interactive H5P element has been excluded from this version of the text. You can view it online here:

https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=111#h5p-24

34.

We've come to the end of this module. Below are the key points that we hope you will take away from the topics covered:

- Get to know the exporting features of your chosen databases and sign up for an account with each database. This will not only save your results and search history, it will save you time if you have to re-do your search.
- Taking some time to pick a citation management tool that is right for you is an essential step in conducting a review. The right tool will help you maintain the integrity of your review and save you time.
- Screening your citations and abstracts against your inclusion and exclusion criteria is the first step in identifying suitable studies.
- If you are conducting a systematic review, it is important to reduce selection bias by having a team based approach to screening.
- Famarizlize yourself with the academic integrity policies of your institution to better understand how plagiarism is defined and how to avoid it.
- Commit to learning the rules or conventions of your chosen citation style.

35.

Official Citation Manuels

APA

American Psychological Association (2020). Publication Manual of the American *Psychological Association: The official guide to APA style* (Seventh ed.). American Psychological Association.

MLA

Modern Language Association of America. (2021). *MLA handbook* (Ninth ed.). Modern Language Association of America.

Turabian (Chicago)

Turabian, Booth, W. C., Colomb, G. G., & Williams, J. M. (2018). *Manual for Writers of Research Papers, Theses, and Dissertations* (9th edition.). University of Chicago Press.

IEEE

IEEE (n.d). *IEEE Reference Guide.* https://ieeeauthorcenter.ieee.org/wp-content/uploads/IEEE-Reference-Guide.pdf

Vancouver or ICMJE

International Committee of Medical Journal Editors. (2021, December). *Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals.* http://www.icmje.org/icmje-recommendations.pdf

Screening

Lefebvre C, Glanville J, Briscoe S, Littlewood A, Marshall C, Metzendorf M-I, Noel-Storr A, Rader T, Shokraneh F, Thomas J, Wieland LS. (2021, February). Chapter 4: Searching for and selecting studies. In Higgins J.P.T, Thomas J, Chandler J, Cumpston M, Li T, Page M.J, Welch V.A. (Eds). Cochrane Handbook for Systematic Reviews of Interventions version 6.2. Cochrane. https://training.cochrane.org/handbook/current/chapter-04

    (see See section 4.6 Selecting Studies)

Bias

Boutron I, Page MJ, Higgins JPT, Altman DG, Lundh A, Hróbjartsson A. (2021, February). Chapter 7: Considering bias and conflicts of interest among the included studies. In Higgins J.P.T, Thomas J, Chandler J, Cumpston M, Li T, Page M.J, Welch V.A. (Eds). *Cochrane Handbook for Systematic Reviews of Interventions version 6.2.* Cochrane. https://training.cochrane.org/handbook/current/chapter-07

Keenan, C. (2018, April 18). *Assessing and addressing bias in systematic reviews.* Meta-Evidence Blog, Campbell Collaboration, UK & Ireland. http://meta-evidence.co.uk/assessing-and-addressing-bias-in-systematic-reviews/

PART V
MODULE 4: STRATEGIC READING

36.

Friends studying outside on campus. From Flicker user Sac State. Licensed under Creative Commons CC BY-ND 2.0

The purpose of this module is to teach you how to manage your reading workload efficiently, and how to identify the key points in the articles you are including in your review.

Learning Outcomes

By the end of this module, you will be able to:

1. Identify the various components that should be present in a peer reviewed study.
2. Evaluate the relevance of a study to your own context.
3. Identify themes that are relevant to your own research questions.
4. Identify the contribution that particular articles, books, and other scholarly pieces make to disciplinary knowledge.
5. Recognize that a given scholarly work may not represent the only (or even the majority) perspective on the issue.
6. Organize your readings with a literature review matrix

37.

Generally speaking, there is a common flow to scholarly articles. While not a template per se, you can be assured that the following components will be present in most articles. **Learning to identify each component is a key step in the strategic reading process,** and will help you save time as you screen articles for relevance. Check out the interactive example below that describes each section.

Example

Click on the purple question marks to learn more about each component of an academic article.

The original version of this chapter contained H5P content. You may want to remove or replace this element.

> *An interactive H5P element has been excluded from this version of the text. You can view it online here:*
> *https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=120#h5p-25*

Structure of an Academic Article by Emma Seston. Licenced under Creative Commons CC BY-NC 4.0.

Key Takeaways

Learning to identify each component is a key step in the strategic reading process, and will help you save time as you screen articles for relevance.

38.

Now that you know about the component parts of scholarly articles, you are prepared to scan your search results and make swift judgments about the relevance of an article to your own context. **Note: this step in the process does not require you to read the entire article!** You will begin by scanning the articles and follow these steps:

Example

Click on the purple question marks to learn more about each step in the process of scanning an academic article for relevance.

The original version of this chapter contained H5P content. You may want to remove or replace this element.

> *An interactive H5P element has been excluded from this version of the text. You can view it online here:*
> *https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=122#h5p-26*

Initial Scan for Relevance by Emma Seston. Licenced under Creative Commons CC BY-NC 4.0.

Key Takeaways

For your first read you can scan the outcome/results or conclusion section and make swift judgments about the relevance of an article to your own context.

39.

Now that you have scanned your search results and have amassed those that are relevant to your context and needs, you can settle in to do what we call critical reading. This is where you must plan to read the entire article **thoroughly.**

Critical Questions to Ask When Reading

Critical reading encourages the reader to **think about *how* an article or argument is constructed**, not just what it says or what the study found. Here are some questions to ask yourself when reading:

1. What are the central ideas or arguments in the paper?
2. Are there words, concepts or research methods used that you don't understand? If so, ensure you follow up with quality resources to ensure comprehension and extend your learning.
3. What is the context for the argument? Have they made explicit connections to existing literature, and located their work within that context?
4. Is their literature review clearly outlined and presented in an inclusive manner? Are there any obvious exclusions? If so, are they accounted for?
5. Who is the author? Who are they writing for? Have they located themselves and their positionality to the topic at hand? Are there any declared (or perceived) conflicts of interest?
6. What evidence is given to support the conclusions?
7. Is the evidence credible, that is, does it come from reliable sources?
8. Is the logic of the argument sound? What are the steps in the argument that leads from the evidence to the conclusion?
9. Are any of their ideas problematic? Are there other lenses that could be used to frame the argument?

Tools for Critical Appraisal

Using a standardized tool for critical appraisal is a good practice to follow. **It demonstrates consistency in evaluation of all articles,** and when working on a research team, it ensures that each individual is asking the same questions.

There are numerous tools for appraisal to choose from. For the most part, there will be disciplinary norms

where certain tools are chosen in order to best represent the specific context. **Looking to other reviews in your field to see what tools are employed** is a good step.

There are various tools such as checklists designed by research organizations that will help you determine if your source is appropriate. Table 4.1 below outlines a sample of free quality assessment tools available for you to use.

Table 4.1. Quality Appraisal Tools

Tool	Organization	Description
CASP Checklists	Critical Appraisal Skills Programme (CASP) from the Public Health Resource Unit, NHS, England	Checklists for assessing the reliability, importance, and applicability of studies. Studies include qualitative studies, systematic reviews, randomized control trials and others.
Critical Appraisal Tools	The Centre for Evidence-Based Medicine (CEBM) from the University of Oxford	A checklist with questions for assessing the reliability, importance, and applicability of studies based on the research question and inclusion criteria.
Risk of Bias 2 (Rob 2) Tool	Cochrane Methods	A manual from the Cochrane Method Network that includes standards for assessing risk of bias in your included studies.
Critical Appraisal Tools	Joanna Briggs Institute	Checklists assessing the trustworthiness, relevance and results of different types of studies.
Study Quality Assessment Tools	National Heart, Lung and Blood Institute	Quality assessment tools for assessing potential flaws in study methods or implementation of different types of studies.

To find the tool right for your review check out the [Quality Assessment and Risk of Bias Tool Repository](#) from Duke University's Medical Center Library & Archives.

Key Takeaways

While selecting your sources, you will need to assess the quality of the research question, the methodology used, the validity of the results and whether the study is applicable to your own review. To help you assess the quality of your chosen sources, consult one of the free checklist tools suggested in Table 4.1.

40.

Complete **Activity 4.1: "Assessing the Quality of Your Sources"** in your Research Roadmap Workbook.

Using a tool for critical appraisal is a good practice to follow. It will help you evaluate your sources and if you are working as a research team, it ensures that each individual is asking the same questions.

Take a moment to review some of the tools and document which ones you might use in your review.

For more information please see [Workbook Instructions](#) in the Introduction Module.

41.

Scanning an academic article for relevancy is an important component of research. In this activity you will scan the article and identify key components such as the research question, methodology used and the conclusion. For your own research you can use this method for the first read of your sources to decide if they are relevant to your review. If they are relevant, you would do a second more thorough reading of your source. We have provided two examples; a qualitative study and a quantitative study. You are free to do both or choose one.

Qualitative Study Example

Use this example study to identify the following components.[1]

Instructions: After taking a guess at the instructions on the front of each card, turn the card to reveal the response. How did you do?

The original version of this chapter contained H5P content. You may want to remove or replace this element.

Qualitative Study Example

Read this example study to identify the following components.[2]

Instructions: After taking a guess at the instructions on the front of each card, turn the card to reveal the response. How did you do?

The original version of this chapter contained H5P content. You may want to remove or replace this element.

1. Katajavuori, N., Vehkalahti, K., & Asikainen, H. (2021). Promoting university students' well-being and studying with an acceptance and commitment therapy (ACT)-based intervention. *Current Psychology*, 1-13 https://link.springer.com/article/10.1007/s12144-021-01837-x#Sec15

2. Hickey, J., Powling, H., McKinney, P., Robbins, T., Carrier, N., & Nash, A. (2020). "It's a change your life kind of program": A healing focused camping weekend for urban Indigenous families living in Fredericton, New Brunswick. First Peoples Child & Family Review, 15(2), 23-44. https://fpcfr.com/index.php/FPCFR/article/view/45

42.

The next step after reading and evaluating your sources is to organize them in a way that will help you start the writing process.

Review Matrix

One way to organize your literature is with a review matrix. The review matrix is a chart that sorts and categorizes the different arguments presented per topic or issue. Using a matrix enables you to quickly compare and contrast your sources in order to determine the scope of research across time. This will allow you to spot similarities and differences between sources. It is particularly useful in the synthesis and analysis stages of a review (See Module 1 Conducting a Literature Review with the SALSA Framework).

Example of a Review Matrix

My research question:

How can we use machine learning to analyze social media data related to HIV?

Sources	Methods	Concept 1	Concept 2	Concept 3	Gaps, Problems, Questions, Notes
Source 1: Signorini, A., Segre, A. M., & Polgreen, P. M. (2011). The use of Twitter to track levels of disease activity and public concern in the U.S. during the influenza A H1N1 pandemic. PloS one, 6(5), e19467.	Collected and stored a large sample of public tweets that matched a set of pre-specified search terms and geocoded. Estimated rate of disease and public sentiment toward swine flu	Able to make predictions about swine flu using social media data. This data is vital given that "an influenza surveillance program does not exist" (p. 3)			"When and where tweets are less frequent (or where only a subset of tweets contain geographic information), the performance of our model may suffer."
Source 2: Chiu, C. J., Menacho, L., Fisher, C., & Young, S. D. (2015). Ethics issues in social media–based HIV prevention in low-and middle-income countries. Cambridge Quarterly of Healthcare Ethics, 24(3), 303-310.	Quantitative survey assessing participants' perspectives on educational intervention	Increasing social media use in low- and middle-income countries. Participant took part in an HIV education program on Facebook	Most participants felt like they benefited positively from the program and learned about HIV prevention. All participants were MSM		Note: Helpful article for including diverse perspectives
Source 3: Bollen, J., Mao, H., & Zeng, X. (2011). Twitter mood predicts the stock market. Journal of computational science, 2(1), 1-8	Collected public tweets and analyzed mood	Gathered data from Twitter posts that explicitly states moods (e.g. "I'm feeling...""). Found that positive/ negative sentiment on Twitter is 87.6% accurate for predicting stock market average		Used a "Self-Organizing Fuzzy Neural Network" to predict Dow Jones Industrial Average (p. 1)	

Create a Review Matrix

Start with a charting tool you are most familiar with (for example MS Word, MS Excel, Google Sheets, Numbers etc).

1. Input your information.

   ◦ Organize your sources from oldest to most recent. This way you can see how the research on your topic has changed over time.

2. Create your columns. The number of columns is up to you, but you will need the following columns to start:

   ◦ First Column: citation (i.e., author, title, source, publication year)
   ◦ Second Column: purpose or summary (1-2 sentences)

3. Depending on your review, you can now choose the remaining columns that will help you organize your sources. The columns should represent the specific content you are analyzing. For example:

   ◦ methodology
   ◦ population
   ◦ geography
   ◦ intervention
   ◦ outcomes

Key Takeaways

Here are some examples of different review matrices and templates:

- Evidence Synthesis Matrix Template, Jane Schmidt, Toronto Metropolitan University (Google Sheets)
- The Matrix Method for Literature Reviews, Brandeis University, Writing Resources.
- Literature Review Synthesis Matrix, Concordia University (MS Word)
- Write a Literature Review: Synthesize. Johns Hopkins University, Sheridan Libraries

43.

An interactive H5P element has been excluded from this version of the text. You can view it online here:

https://ecampusontario.pressbooks.pub/tmuh5ptest/?p=132#h5p-27

44.

We've come to the end of this module. Below are the key points that we hope you will take away from the topics covered:

- Learning to identify each component is a key step in the strategic reading process, and will help you save time as you screen articles for relevance.
- For your first read you can scan the outcome/results or conclusion section and make swift judgments about the relevance of an article to your own context.
- While selecting your sources, you will need to assess the quality of the research question, the methodology used, the validity of the results and whether the study is applicable to your own review. To help you assess the quality of your chosen sources, consult one of the free checklist tools suggested in Table 4.1.
- Finally a literature review matrix will help you organize your readings when it comes time to write your review.

45.

Reading Strategies

Greenhalgh T. (1997). How to read a paper. Getting your bearings (deciding what the paper is about). *BMJ (Clinical research ed.)*, 315(7102), 243–246. https://doi.org/10.1136/bmj.315.7102.243

Sweeney, M. "How to Read for Grad School." *Miriam E. Sweeney*, 20 June 2012, https://miriamsweeney.net/2012/06/20/readforgradschool/.

Quality Assessment

Greenhalgh T. (1997). Assessing the methodological quality of published papers. *BMJ (Clinical research ed.)*, 315(7103), 305–308. https://doi.org/10.1136/bmj.315.7103.305

Greenhalgh, T., & Taylor, R. (1997). Papers that go beyond numbers (qualitative research). *BMJ (Clinical research ed.)*, 315(7110), 740–743. https://doi.org/10.1136/bmj.315.7110.740

Literature Review Matrix

Evidence Synthesis Matrix Template, Jane Schmidt, Toronto Metropolitan University (Google Sheets)

The Matrix Method for Literature Reviews, Brandeis University, Writing Resources.

Literature Review Synthesis Matrix, Concordia University (MS Word)

Write a Literature Review: Synthesize. Johns Hopkins University, Sheridan Libraries

Helpful Websites

Systematic Review Guide: Critical Appraisal (St. Michael's Hospital Health Science Library)

Systematic Reviews: Quality Assessment (University of North Carolina Health Science Library)

PART VI
CONCLUSION AND MORE RESOURCES

46.

Congratulations on completing this short course on conducting an academic review! As you start to work through your review, we hope you notice that you are part of a long line of researchers adding their voice to the scholarly discourse of your topic. Your work is contributing to this discourse. As a researcher, you are an active member of creating new knowledge and not just a consumer of it.

We hope you have come away from this short course with an understanding that there is value in using your intellectual curiosity in learning new investigative methods. Finally, as a researcher, it is normal to encounter challenges and doubts when conducting research, but this can be overcome with persistence, adaptability, and flexibility.

Learning Outcomes

Below are the learning outcomes for this course that we shared with you in the Introduction section. Please take some time to review the list and see how many outcomes you achieved.

By completing this short course, you should now be able to:

1. Understand the specific characteristics of your chosen review and describe the steps involved in conducting a successful review.
2. Determine your research question and design and refine your own search strategy.
3. Choose appropriate resources to search and recognize other serendipitous methods of information gathering.
4. Develop a plan to organize your sources.
5. Screen your search results and pick relevant sources for your review.
6. Recognize how to avoid plagiarism and demonstrate the rules of your chosen citation style.
7. Evaluate the relevance of a source to your own context.

47.

How to Conduct a Literature Review

Aveyard, H. (2019). *Doing a literature review in health and social care: A practical guide (Fourth ed.)* Open University Press, McGraw-Hill Education.

Jesson, J., Matheson, L., & Lacey, F. M. (2011). *Doing your literature review: Traditional and systematic techniques.* SAGE.

Ridley, D., Dr. (2008). *The literature review: A step-by-step guide for students.* SAGE.

Websites

- [Guide to Literature Reviews](#) (McMaster University Library)

Constructing a Research Question

Alvesson, M., & Sandberg, J. (2013). *Constructing research questions: Doing interesting research.* SAGE.

DeCarlo, M (2018) Chapter 8: Creating and refining a research question in *Scientific Inquiry in Social Work*. Open Social Work Education. https://scientificinquiryinsocialwork.pressbooks.com/

Denney, A. S., & Tewksbury, R. (2013). How to Write a Literature Review. *Journal of Criminal Justice Education*, 24(2), 218–234. https://doi.org/10.1080/10511253.2012.730617

How to Search

Videos

The National Library of Medicine (2013, February 14). Use MeSH to Build a Better PubMed Query [Video]. YouTube. https://www.youtube.com/watch?v=uyF8uQY9wys

UTS Library (2021, February 23). Medline Ovid: Advanced Searching [Video]. YouTube https://www.youtube.com/watch?v=6QQ0MW_jXfM

Websites

- [Searching for Sources (Research Skills Tutorial)](#), Toronto Metropolitan University Library
- [Library Research Skills Tutorial](#), McMaster University Library

Reading Strategies

Greenhalgh T. (1997). How to read a paper. Getting your bearings (deciding what the paper is about). *BMJ (Clinical research ed.*), 315(7102), 243–246. https://doi.org/10.1136/bmj.315.7102.243

Sweeney, M. "How to Read for Grad School." *Miriam E. Sweeney*, 20 June 2012, https://miriamsweeney.net/2012/06/20/readforgradschool/.

Quality Assessment

Greenhalgh T. (1997). Assessing the methodological quality of published papers. *BMJ (Clinical research ed.)*, 315(7103), 305–308. https://doi.org/10.1136/bmj.315.7103.305

Greenhalgh, T., & Taylor, R. (1997). Papers that go beyond numbers (qualitative research). *BMJ (Clinical research ed.)*, 315(7110), 740–743. https://doi.org/10.1136/bmj.315.7110.740

Checklists and Tools

- [CASP Checklist](#)s Critical Appraisal Skills Programme (CASP) from the Public Health Resource Unit, NHS, England
- [Critical Appraisal Tools](#) The Centre for Evidence-Based Medicine (CEBM) from the University of Oxford
- [Risk of Bias 2 (Rob 2) Tool](#) Cochrane Methods
- [Critical Appraisal Tools](#) Joanna Briggs Institute
- [Study Quality Assessment Tools](#) National Heart, Lung and Blood Institute

Writing

Allen, J. (2019). *The productive graduate student writer: How to manage your time, process, and energy to write your research proposal, thesis, and dissertation, and get published (First ed.).* Stylus Publishing, LLC.

Denney, A. S., & Tewksbury, R. (2013). How to Write a Literature Review. *Journal of Criminal Justice Education,* 24(2), 218–234. https://doi.org/10.1080/10511253.2012.730617

Feak, C. B., & Swales, J. M. (2009). *Telling a research story: Writing a literature review*. University of Michigan Press.

Holland, K., & Watson, R. (2021). *Writing for publication in nursing and healthcare: Getting it right (Second;2; ed.)*. John Wiley & Sons Ltd.

Walliman, N. (2006). Writing a literature review. In *Social research methods* (pp. 182-185). SAGE Publications, Ltd,

Website

- [Writing a Literature Review](#) (OWL, Purdue University)

Official Citation Manuels

APA

American Psychological Association (2020). *Publication Manual of the American Psychological Association: The official guide to APA style (Seventh ed.).* American Psychological Association.

MLA

Modern Language Association of America. (2021). *MLA handbook (Ninth ed.)*. Modern Language Association of America.

Turabian (Chicago)

Turabian, Booth, W. C., Colomb, G. G., & Williams, J. M. (2018). *Manual for Writers of Research Papers, Theses, and Dissertations (9th edition.)*. University of Chicago Press.

IEEE

IEEE (n.d). *IEEE Reference Guide*. https://ieeeauthorcenter.ieee.org/wp-content/uploads/IEEE-Reference-Guide.pdf

Vancouver or ICMJE

International Committee of Medical Journal Editors. (2021, December). *Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals.* http://www.icmje.org/icmje-recommendations.pdf

48.

How to Conduct a Systematic Review

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, 8(1), 19-32. doi:10.1080/1364557032000119616

Boland, A., Cherry, M. G., & Dickson, R. (2014). *Doing a systematic review: A student's guide*. SAGE.

Ganann, R., Ciliska, D., & Thomas, H. (2010). Expediting systematic reviews: Methods and implications of rapid reviews. *Implementation Science*, 5(1), 56-56. doi:10.1186/1748-5908-5-56

Glass, G. (1976). Primary, Secondary, and Meta-Analysis of Research. *Educational Researcher*, 5(10), 3-8. doi:10.2307/1174772

Gough, D., & Richardson, M. (2018). Systematic reviews. In *Advanced research methods for applied psychology* (pp. 63-75). Routledge.

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. https://doi.org/10.1111/j.1471-1842.2009.00848.x

Higgins J.P.T, Thomas J, Chandler J, Cumpston M, Li T, Page M.J, Welch V.A. (Eds). (2021, February). *Cochrane Handbook for Systematic Reviews of Interventions version 6.2.* Cochrane. www.training.cochrane.org/handbook.

Websites

- Systematic Reviews (Toronto Metropolitan University)
- Cochrane Database of Systematic Reviews (Cochrane)
- Systematic Review Guide (Unity Health Toronto)
- Knowledge syntheses: Systematic & Scoping Reviews, and other review types (University of Toronto Libraries, Gerstein Science Information Centre)

Online Courses on Systematic Reviews

The following guide provides a list of online self-directed learning on how to conduct a systematic review

Online Courses on Systematic Reviews (St. Michael's Hospital Health Science Library)

Registering Your Systematic Review

- [PROSPERO](#)
- [Campbell Collaboration](#)
- [Cochrane Collaboration](#)

Creating Your Protocol

- [PRISMA extension for Protocols](#)
- [MECIR (Methodological Expectations for Cochrane Intervention Reviews) Manual](#)
- [Sample Protocol Template](#) from the Evidence Synthesis Coordinator at the Maritimes Strategy for Patient-Oriented Research (SPOR) Support Unit.

Documenting Your Review with PRISMA

- [PRISMA 2020](#)

Constructing a Research Question

Alvesson, M., & Sandberg, J. (2013). *Constructing research questions: Doing interesting research.* SAGE.

Boland, A., Cherry, M. G., & Dickson, R. (2017). Chapter 3 in *Doing a systematic review: A student's guide* (Second ed.). SAGE.

DeCarlo, M (2018) Chapter 8: Creating and refining a research question in *Scientific Inquiry in Social Work*. Open Social Work Education. https://scientificinquiryinsocialwork.pressbooks.com/

Denney, A. S., & Tewksbury, R. (2013). How to Write a Literature Review. *Journal of Criminal Justice Education*, 24(2), 218–234. https://doi.org/10.1080/10511253.2012.730617

Thomas J, Kneale D, McKenzie JE, Brennan SE, Bhaumik S. (2021, February). Chapter 2: Determining the scope of the review and the questions it will address. In Higgins J.P.T, Thomas J, Chandler J, Cumpston M, Li T, Page M.J, Welch V.A. (Eds). *Cochrane Handbook for Systematic Reviews of Interventions version 6.2*. Cochrane. https://training.cochrane.org/handbook/current/chapter-02

How to Search

Lefebvre C, Glanville J, Briscoe S, Littlewood A, Marshall C, Metzendorf M-I, Noel-Storr A, Rader T, Shokraneh F, Thomas J, Wieland LS. (2021, February). Chapter 4: Searching for and selecting studies.In Higgins J.P.T, Thomas J, Chandler J, Cumpston M, Li T, Page M.J, Welch V.A. (Eds). *Cochrane Handbook for Systematic Reviews of Interventions version 6.2.* Cochrane. https://training.cochrane.org/handbook/current/chapter-04

Sayers, A. (2008). Tips and tricks in performing a systematic review. *British Journal of General Practice*, 58(547), 136-136. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2151802/

CADTH Search Filters Database: https://searchfilters.cadth.ca/

Videos

- The National Library of Medicine (2013, February 14). Use MeSH to Build a Better PubMed Query [Video]. YouTube. https://www.youtube.com/watch?v=uyF8uQY9wys
- UTS Library (2021, February 23). Medline Ovid: Advanced Searching [Video]. YouTube https://www.youtube.com/watch?v=6QQ0MW_jXfM

Websites

- Searching for Sources (Research Skills Tutorial), Toronto Metropolitan University Library
- Library Research Skills Tutorial, McMaster University Library

Screening

Lefebvre C, Glanville J, Briscoe S, Littlewood A, Marshall C, Metzendorf M-I, Noel-Storr A, Rader T, Shokraneh F, Thomas J, Wieland LS. (2021, February). Chapter 4: Searching for and selecting studies. In Higgins J.P.T, Thomas J, Chandler J, Cumpston M, Li T, Page M.J, Welch V.A. (Eds). *Cochrane Handbook for Systematic Reviews of Interventions version 6.2.* Cochrane. https://training.cochrane.org/handbook/current/chapter-04

(see See section 4.6 Selecting Studies)

Reading Strategies

Greenhalgh T. (1997). How to read a paper. Getting your bearings (deciding what the paper is about). *BMJ (Clinical research ed.)*, 315(7102), 243–246. https://doi.org/10.1136/bmj.315.7102.243

Sweeney, M. "How to Read for Grad School." *Miriam E. Sweeney*, 20 June 2012, https://miriamsweeney.net/2012/06/20/readforgradschool/.

Bias and Quality Assessment

Boutron I, Page MJ, Higgins JPT, Altman DG, Lundh A, Hróbjartsson A. (2021, February). Chapter 7: Considering bias and conflicts of interest among the included studies. In Higgins J.P.T, Thomas J, Chandler J, Cumpston M, Li T, Page M.J, Welch V.A. (Eds). *Cochrane Handbook for Systematic Reviews of Interventions version 6.2*. Cochrane. https://training.cochrane.org/handbook/current/chapter-07

Greenhalgh T. (1997). Assessing the methodological quality of published papers. *BMJ (Clinical research ed.)*, 315(7103), 305–308. https://doi.org/10.1136/bmj.315.7103.305

Greenhalgh, T., & Taylor, R. (1997). Papers that go beyond numbers (qualitative research). *BMJ (Clinical research ed.)*, 315(7110), 740–743. https://doi.org/10.1136/bmj.315.7110.740

Keenan, C. (2018, April 18). Assessing and addressing bias in systematic reviews. *Meta-Evidence Blog*, Campbell Collaboration, UK & Ireland. http://meta-evidence.co.uk/assessing-and-addressing-bias-in-systematic-reviews/

Checklists and Tools for Quality Assessment

- CASP Checklists Critical Appraisal Skills Programme (CASP) from the Public Health Resource Unit, NHS, England
- Critical Appraisal Tools The Centre for Evidence-Based Medicine (CEBM) from the University of Oxford
- Risk of Bias 2 (Rob 2) Tool Cochrane Methods
- Critical Appraisal Tools Joanna Briggs Institute
- Study Quality Assessment Tools National Heart, Lung and Blood Institute

Websites for Quality Assessment

- Systematic Review Guide: Critical Appraisal (St. Michael's Hospital Health Science Library)
- Systematic Reviews: Quality Assessment (University of North Carolina Health Science Library)

Tools for Assessing Bias

- ROBIS – A tool for assessing the risk of bias in systematic reviews
- AMSTAR2 – AMSTAR stands for A MeaSurement Tool to Assess Systematic Reviews.

Analyzing Data

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