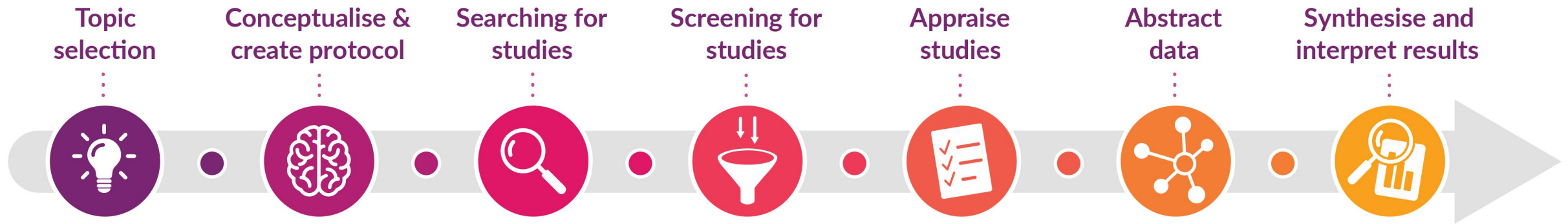


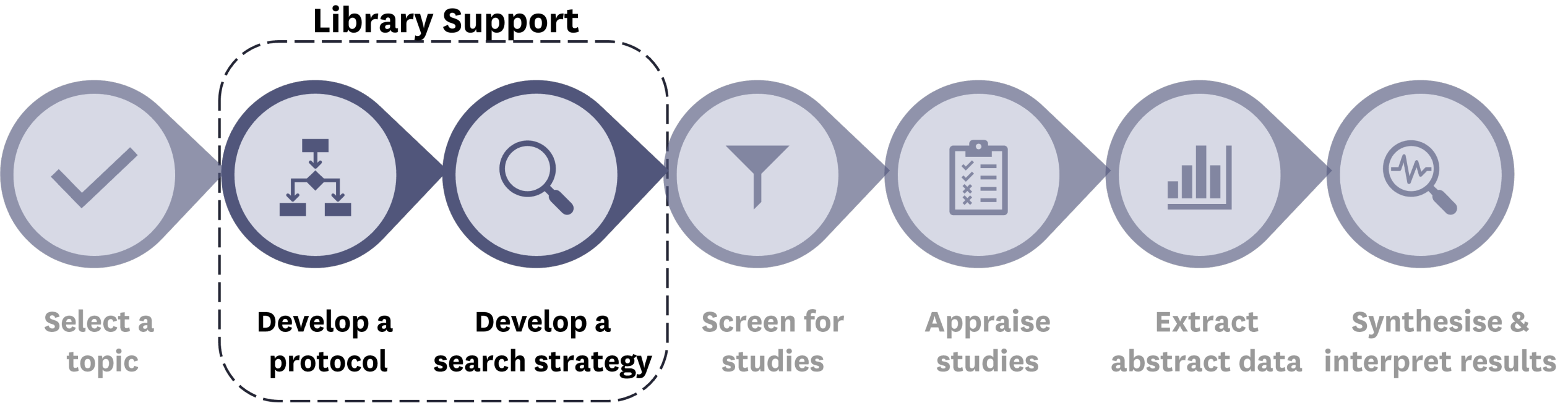
Understanding Systematic Reviews Workshop



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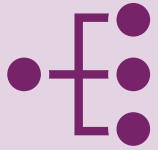
Illustration created by Karolinska Institutet University Library.

Library Support

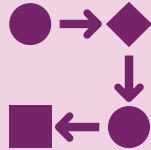


One-on-one support: Guidance on the review process and methodology, feedback on search strategies, database selection and protocols, guidance on expert search techniques that may improve your strategy, advice on translating your search to other databases.

Workshop Objectives



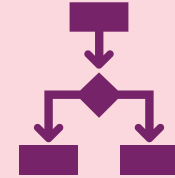
Which review type is right?



Systematic review process



Research question & framework



Develop your protocol



Build your search strategy

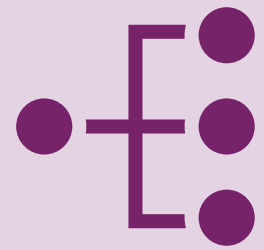


Run your search strategy



The next steps

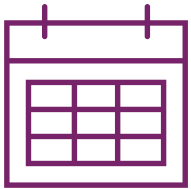




Review types



Literature/Narrative Review



Timeframe:

1 to 6 weeks

Useful for:

- Providing an overview of main theories and hypotheses, appropriate methods and methodologies, and key findings.
- Showcasing the key authors/researchers on a topic.
- Identifying knowledge gaps.

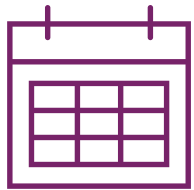
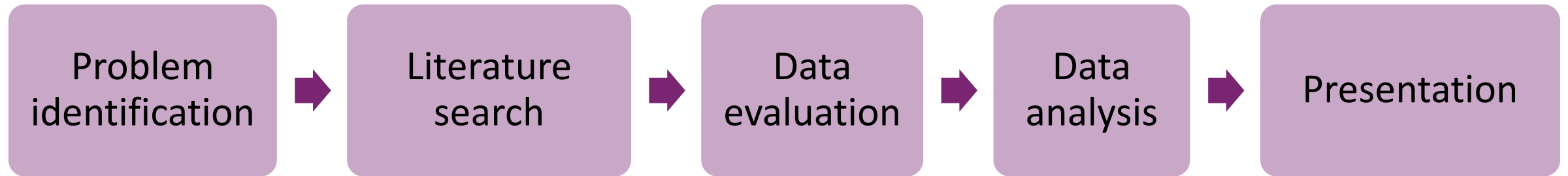
Limitations:

- Bias Risk: Susceptibility to the reviewer's biases or perspectives.
- Lack of Rigor: Absence of a structured methodology can lead to a less systematic approach.
- Limited Scope: May not encompass the entire breadth of available literature due to selective inclusion.

Further Reading:

Ferrari, R. (2015). [Writing narrative style literature reviews](#). *Medical writing*, 24(4), 230-235
Jones, B. (2007). [Ask the Professor about... good literature reviews](#)

Integrative Review



Timeframe:

2 months to
2 years

Useful for:

- Informing policy and processes.
- Defining concepts.
- Reviewing theories.
- Analysing methodological issues.

Limitations:

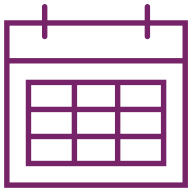
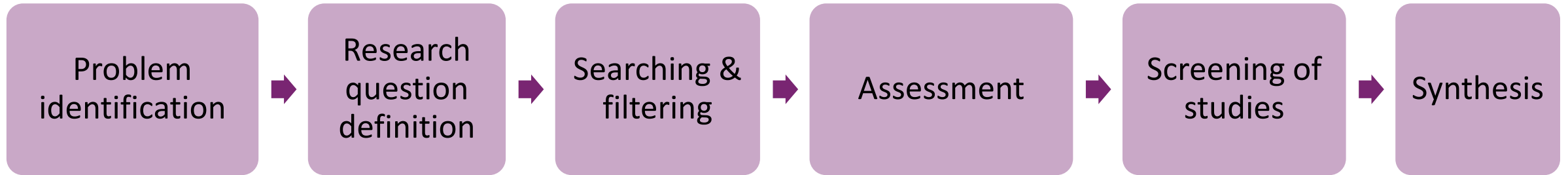
- Resource Intensity: Conducting comprehensive reviews is time and resource-demanding.
- Publication Bias: Reliance on published literature might overlook unpublished studies.
- Synthesis Challenges: Diverse methodologies can make synthesizing findings difficult.

Further Reading:

Dhollande, S., Taylor, A., Meyer, S., & Scott, M. (2021). [Conducting integrative reviews: A guide for novice nursing researchers](#). *Journal of Research in Nursing*, 26(5), 427-438.

Whittemore, R., & Knafl, K. (2005). [The integrative review: updated methodology](#). *Journal of advanced nursing*, 52(5), 546-553.

Rapid Review



Timeframe:

2 months to
6 months

Overview:

- Is a variation of a systematic review but balances time constraints with considerations in bias.
- Can exclude hand searching and grey literature.
- May apply limits such as years and language.
- Can be done Individually or a group.

Limitations:

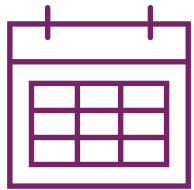
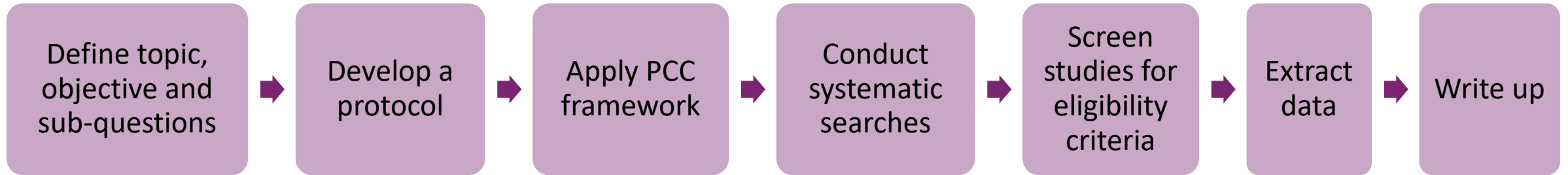
- Reduced Depth: Limited time may compromise the depth of analysis.
- Potential Bias: Quick turnaround might increase the risk of bias or oversight.
- Quality Compromise: Rapid reviews might sacrifice thoroughness, affecting overall quality.

Further Reading:

Dobbins, M. (2017). [Rapid review guidebook](#). *Natl Collab Cent Method Tools*, 13, 25.

Garritty, C., et al (2021). [Cochrane Rapid Reviews Methods Group offers evidence-informed guidance to conduct rapid reviews](#). *Journal of clinical epidemiology*, 130, 13-22.

Scoping Review



Timeframe:

6 months to
18 months

Useful for:

- Examining a body of literature that has not been comprehensively reviewed.
- Identifying or clarifying key concepts or definitions.
- Seeing how research is conducted on a topic.

Limitations:

- Lack of Detailed Analysis: Focuses on breadth rather than depth, potentially limiting in-depth analysis.
- Inclusion of Varied Evidence: Due to inclusivity, the quality and heterogeneity of studies might vary widely.
- Potential for Bias: Inherent subjectivity in selection and analysis may introduce bias

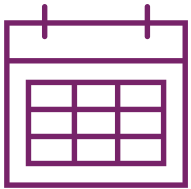
Further Reading:

Peters MDJ, Godfrey C, McInerney P, Munn Z, Tricco AC, Khalil, H. [Scoping Reviews](#) (2020). Aromataris E, Lockwood C, Porritt K, Pilla B, Jordan Z, editors. *JBIManual for Evidence Synthesis*. JBI; 2024.

Quantitative Systematic Review

Overview:

Seek to answer a specific question with narrow parameters. Often look at interventions or treatments.



Timeframe:

8 months to
2 years

Useful for:

- Confirming current practices
- Guiding decision-making
- Informing future research

Limitations:

- Time and Resource Intensity: Conducting thorough systematic reviews can be time-consuming and resource-intensive.
- Heterogeneity of Studies: Variability in methodologies across included studies can complicate synthesis.
- Inherent Bias: Despite systematic approaches, biases in study selection and analysis can still exist.

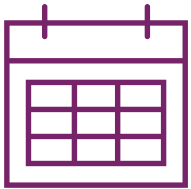
Further Reading:

Borah, R., et al (2017). [Analysis of the time and workers needed to conduct systematic reviews of medical interventions using data from the PROSPERO registry](#). *BMJ open*, 7(2)
Higgins JPT, et al. [Cochrane Handbook for Systematic Reviews of Interventions version 6.4](#) (updated August 2023). Cochrane, 2023.

Qualitative Systematic Review

Overview:

A qualitative systematic review combines and analyses qualitative research on a specific topic. This helps to understand the experiences, perceptions, beliefs, behaviors, and social processes of individuals or groups.



Timeframe:

8 months to
2 years

Useful for:

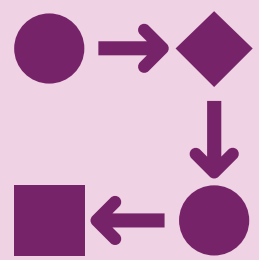
- Aims to understand the meaning and context behind human experiences and phenomena.

Limitations:

- Variability in study designs, contexts, and methods included makes comparison and synthesis challenging.
- Thematic synthesis and interpretation take a lot of time and effort.
- Synthesising diverse perspectives requires careful interpretation.

Further Reading:

Melián, E., Reyes, J. I., & Meneses, J. (2023). [The Online PhD Experience: A Qualitative Systematic Review](#). *International Review of Research in Open and Distance Learning*, Bulter, A., et al. (2016). [A guide to writing a qualitative systematic review protocol to enhance evidence-based practice in nursing and health care](#). *World views on Evidence-based Nursing*, 13(3), 241-249.



Systematic review process



Purpose of a Systematic Review

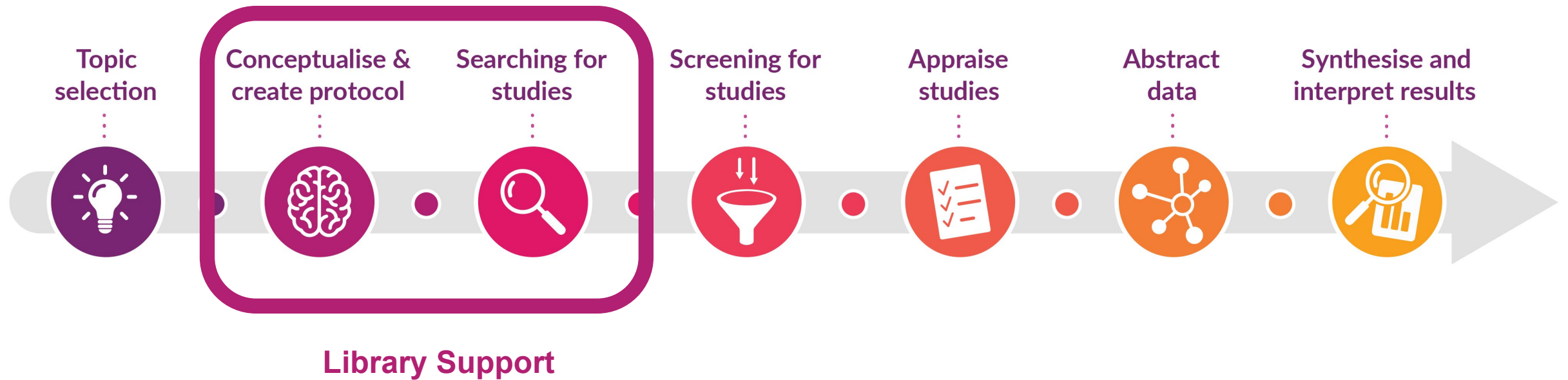
Systematic reviews aim to

identify, evaluate, and summarize the findings of all relevant individual studies

over a health-related issue, thereby making the available evidence more accessible to decision makers.

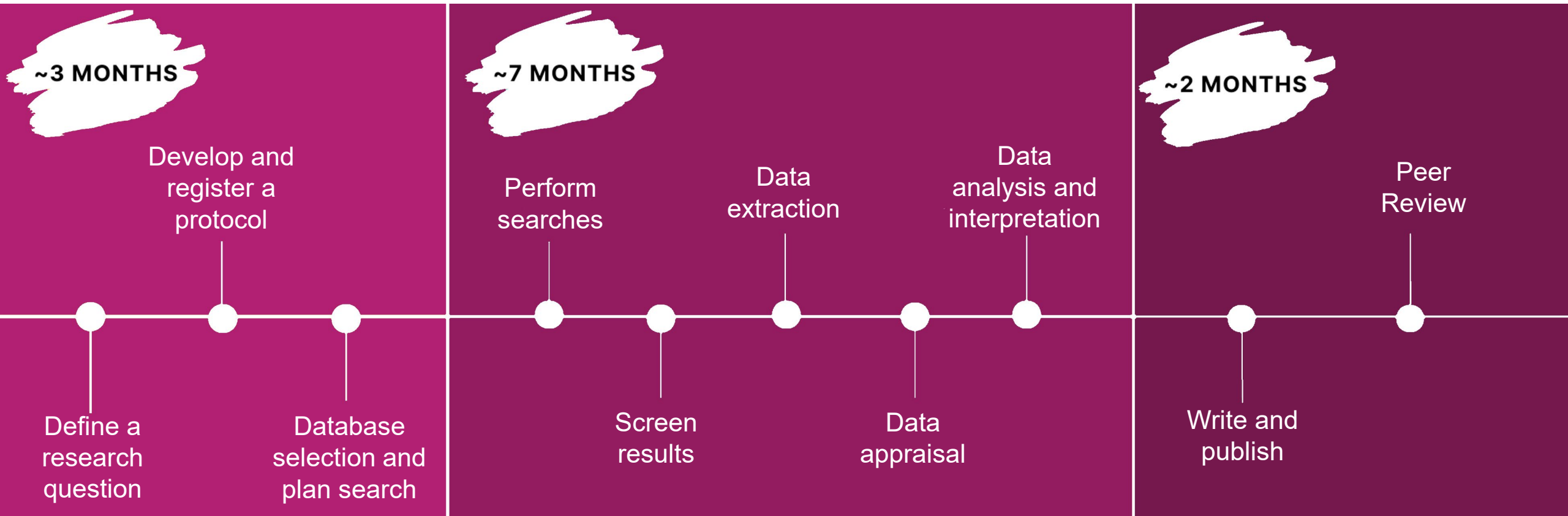
Gopalakrishnan, S., & Ganeshkumar, P. (2013). Systematic Reviews and Meta-analysis: Understanding the Best Evidence in Primary Healthcare. *Journal of family medicine and primary care*, 2(1), 9–14.

Systematic Review Steps



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Systematic Review Timeline



What questions to ask yourself

Is your topic new?

Do you have
statistical support?

Do you have a
team?

Do you have
time?



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Handbooks and guides

- [The Cochrane Handbook](#)
- [Joanna Briggs Institute \(JBI\)](#)
- [UoA Systematic Review Guide](#)
- [Monash University Systematic Review LibGuide \(Australia\)](#)



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? Research question & frameworks

Developing a research question

Research topic

Broad area
of research

Research question

Answerable

Focused

Specific

New

How to check if your topic/question is new?

- Check for protocols on **PROSPERO**
- Check databases for reviews on your topic:
 - **Medline**
 - **Cochrane Library**
 - **Scopus**
 - Search within a discipline specific database using **Subject Guides**.

Use "systematic review" AND your topic as keywords.



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Mnemonic Frameworks

Research questions are often structured using frameworks. There are many types of research frameworks, and the ones we present here are mnemonics – patterns of letters that aid memory. These frameworks help researchers to:

- **Formulate a clear research question:** Each letter guides the definition of a key aspect of the question.
- **Develop a search strategy:** The defined elements create focused search terms to find relevant literature.
- **Ensure the review is reproducible:** Clearly defining the research question makes the process transparent and potentially repeatable.

Quantitative Framework:

P	Population, Patient, Problem
I	Intervention or Exposure
C	Comparison
O	Outcome Measures

Qualitative Framework:

P	Population
E	Exposure
O	Outcomes

Using a framework to develop a question

Research topic: What specific aspects of nursing education were impacted by distance learning during the Covid-19 pandemic, such as satisfaction with learning, academic achievement, instructor-student interaction, self-efficacy, problem-solving ability, and critical thinking? How does this compare to nursing success in traditional face-to-face learning?



Population

Intervention

Comparison

Outcomes



Image made by Freepik from www.storyset.com

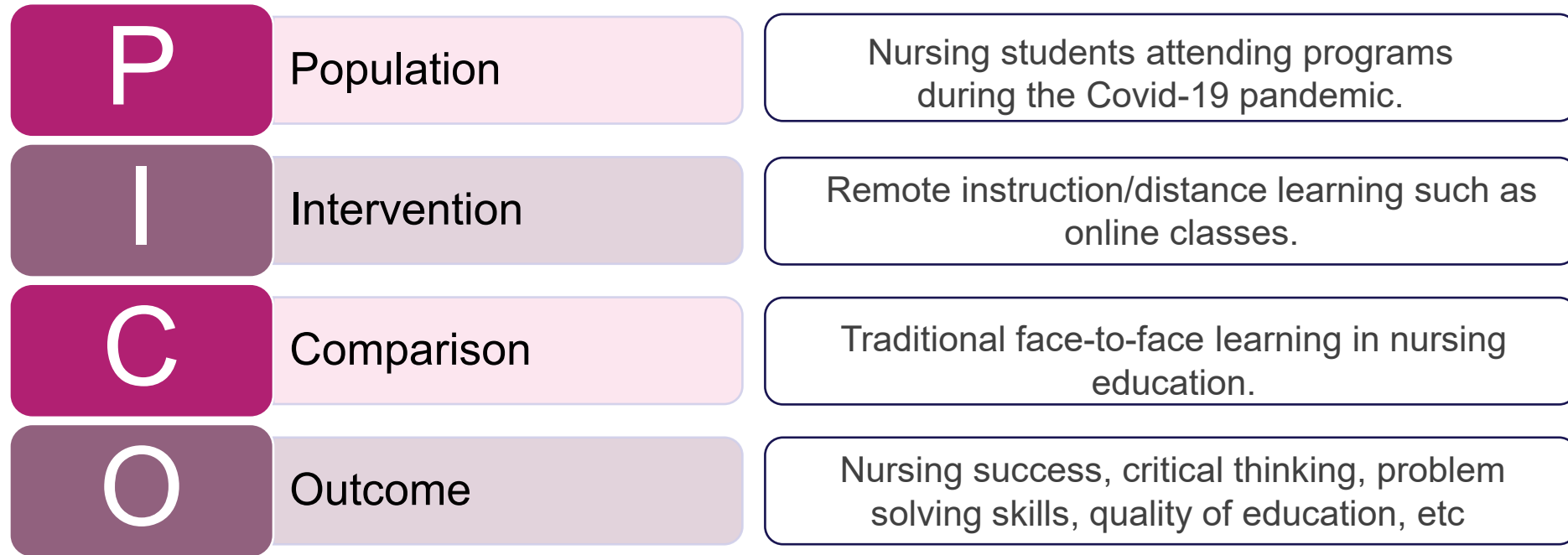


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NEW ZEALAND

Using a framework to develop a question

P	Population	Nursing students attending programs during the Covid-19 pandemic.
I	Intervention	Remote instruction/distance learning such as online classes.
C	Comparison	Traditional face-to-face learning in nursing education.
O	Outcome	Nursing success, critical thinking, problem solving skills, quality of education, etc

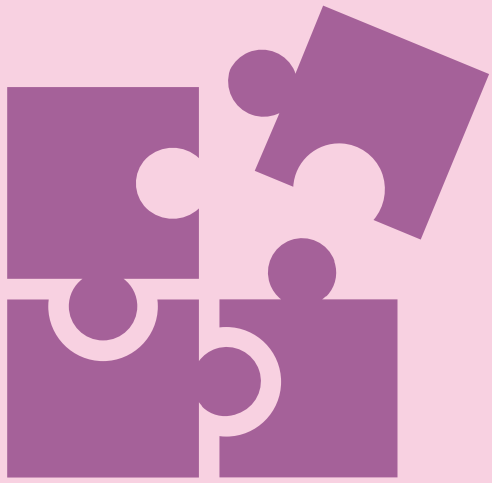
Using a framework to develop a question



Research question: What are the impacts of remote instruction methods on the learning outcomes of undergraduate nursing students during the COVID-19 pandemic compared to traditional face-to-face instruction?

Popular Frameworks

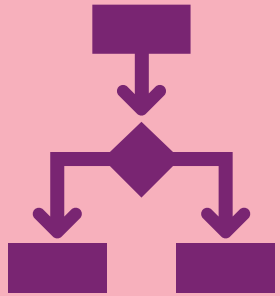
P I C O	P opulation or P atient, I ntervention, C omparison, O utcome	Quantitative research questions.	Example question: Does the use of aspirin reduce the risk of heart attacks in adults with a history of cardiovascular disease?
P E O	P opulation or Problem or Patient, E xposure, O utcome	Qualitative research questions.	Example question: How does access to green spaces affect the mental health and well-being of adults living in urban areas?
P C C	P opulation, C oncept, C ontext	Both qualitative and quantitative (mixed methods) topics, commonly used in scoping reviews	Example question: How do high school teachers perceive online teaching methods in middle income countries?
S P I D E R	S ample, P henomenon of Interest, D esign, E valuation, R esearch Type	Useful for qualitative and mixed method type research questions.	Example question: What are the experiences of visitors at historical reenactment events, and how do these experiences influence their understanding of history?
S P I C E	S etting, P opulation or perspective, I ntervention, C omparison, E valuation	Useful for qualitative and mixed method type research questions.	Example question: What are the effects of predictive maintenance systems on the operational reliability of industrial machinery?
E C L I P S E	E xpectation, C lient group, L ocation, I mpact, P rofessionals, S ervice	Useful for qualitative and mixed method type research questions.	Example question: What impact do immersive language programmes have on the fluency and cultural understanding of students learning a second language?



Activity #1

Write down your research topic or question.

If you have time: Start thinking about which mnemonic framework (if any) might be appropriate for your research topic.

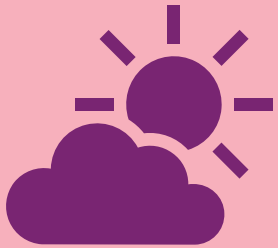


Protocol

What is a Protocol

The protocol describes the rationale and proposed methods of the review - it is the plan your systematic review will follow.

Why do systematic reviews need a protocol?



Transparency



Reduce biases



Consistency



Duplication

Check out the protocol of our example [Clarke 2021](#). The protocol was created in 2003.

What is included in a Protocol?

Your protocol should contain:

- Administrative information – title, reviewers, registration number, sponsors, etc.
- Rationale & objectives.
- Methods – eligibility criteria, **search strategy**, data management, etc.

Templates:

- [PROSPERO systematic review template](#)
- [OSF systematic review template](#)
- [Cochrane guide for protocol development](#)
- [PRISMA protocols checklist](#)



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Questions to ask yourself

What is the scope of your enquiry?

What will be included & excluded in your study?

What date range will you be working within?

Will you limit to studies from a particular country/region?

Does your population group have a specific age/gender?

Will you use gray literature?



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Where can you register your protocol?

PROSPERO

Is an international database for prospectively registered systematic reviews.

The Open Science Framework

Is a free open platform that supports research through the entire project life cycle. Among other functions, it offers preregistration

Cochrane Library of Systematic Reviews

Offer registration for affiliated papers.

Research Registry

includes all types of research studies including systematic reviews. Allows prospective and retrospective registrations.

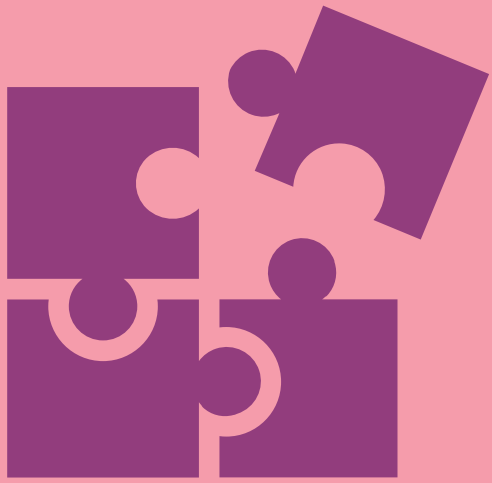
Joanna Briggs Institute (JBI)

Offer registration for affiliated papers.

INPLASY accepts a wider variety of protocols including scoping reviews.



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Activity #2

Write down some of the criteria you need for your protocol.





Search strategy



What is a search strategy?

- A search strategy **details the way you plan to search databases.**
- A search strategy is comprised of keywords, subject headings and database filters.
- The aim of a systematic review is to evaluate and summarise all information available about a topic. Therefore, the success of a systematic review depends on the search strategy.

Where to start?

- Online Thesaurus
- MeSH Database
- Author keywords from articles on your topic.

Abstract

The use of electronic cigarettes (e-cigarettes) is common and increasing, especially among youth. In 2022/2023, 30% of 12- to 17-year-olds reported ever using e-cigarettes in Australia-a >50% increase from 2017 (14%). Several adverse e-cigarette health effects have been identified and most effects remain unknown. Social norms, rules that govern social behaviours, are associated with current and future adolescent e-cigarette use. Understanding social norms in Australian adolescents is critical to the development of targeted and effective e-cigarette prevention activities. This study aims to explore e-cigarette social norms among adolescents living in New South Wales, Australia. A total of 32 online single or paired semi-structured qualitative interviews were conducted involving 46 participants aged 14-17 years, as part of the Generation Vape project. Reflexive thematic analysis was applied within a constructivist perspective. Adolescents perceived e-cigarettes use as prolific among their peers, with use considered common, acceptable and normal. Fuelled by social exposure to e-cigarettes, 'everyone' was generally thought to be using them (descriptive norms). E-cigarette use was considered so entrenched that it was part of adolescent identity, with abstinence regarded as atypical. Use was driven by an internalised desire to fit it (injunctive norm), rather than being attributed to overt/external 'peer-pressure'. Positive e-cigarette norms exist among Australian adolescents with norm formation strongly influenced by social exposure, including e-cigarette promotion. Prevention efforts should include limiting adolescent exposure to e-cigarette marketing to help redefine existing pro-e-cigarette social norms and protect health.

Keywords: descriptive norms; e-cigarette marketing; electronic cigarettes; injunctive norms; social exposure; social norms.

Yazidjoglou, A., Watts, C., Joshy, G., Banks, E., & Freeman, B. (2024). Electronic cigarette social norms among adolescents in New South Wales, Australia. *Health promotion international*, 39(2), daae018.

<https://doi.org/10.1093/heapro/daae018>

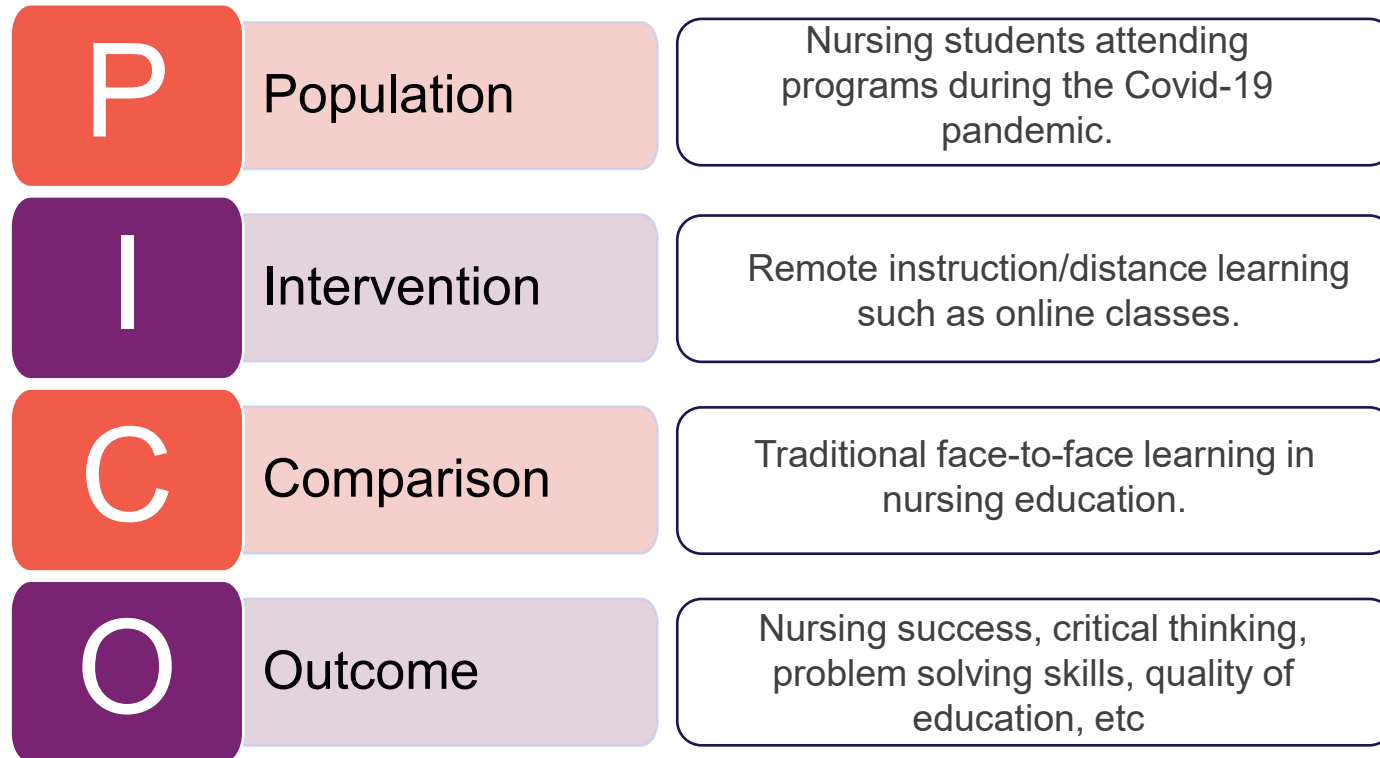
Keywords vs subject headings?



Curtin University. (2017, April 10). *Keywords vs. Subject Headings* [Video]. YouTube. <https://www.youtube.com/watch?v=bNIG4qLuhJA>

Finding keywords using your PICO

Research question: What are the impacts of remote instruction methods on the learning outcomes of undergraduate nursing students during the COVID-19 pandemic compared to traditional face-to-face instruction?



Nursing students

Nursing education

Student nurses

Covid-19

Distance learning

Online learning

Distance education
Online education

E-learning

Face-to face learning

In-person education

Learning outcomes

Student success

Turning your keywords into a concept map

	Concept 1: Nursing students	Concept 2: Covid-19	Concept 3: Online learning	Concept 4: Learning outcomes
Keywords	Nursing students	Covid-19	Online Learning	Learning Outcomes
Synonyms				
Subject Headings (e.g. MESH)				

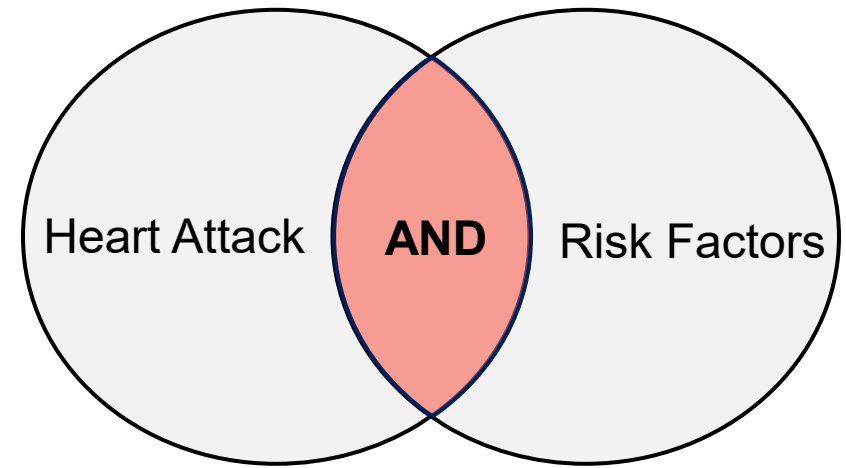
Boolean Operators

AND

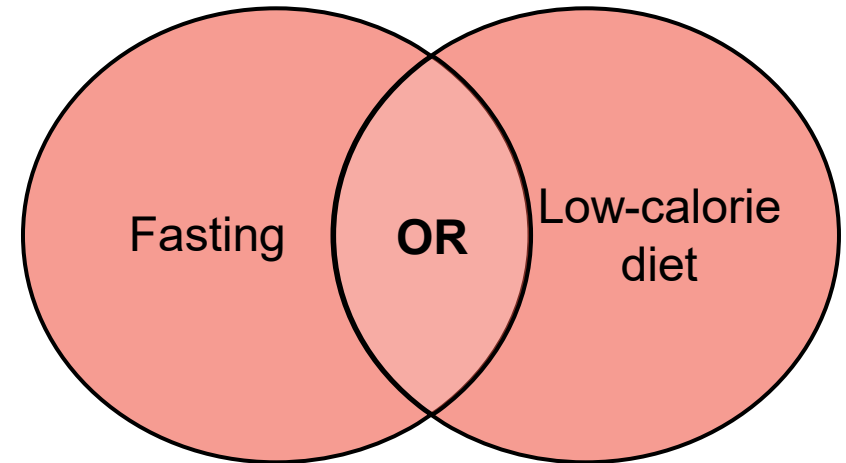
- Includes **both** search terms
- Many databases use AND by default
- **Narrows** your search

OR

- Includes **either** search term
- **Broadens** your search



E.g. *heart attack* **AND** *risk factors* returns documents containing **both** terms.



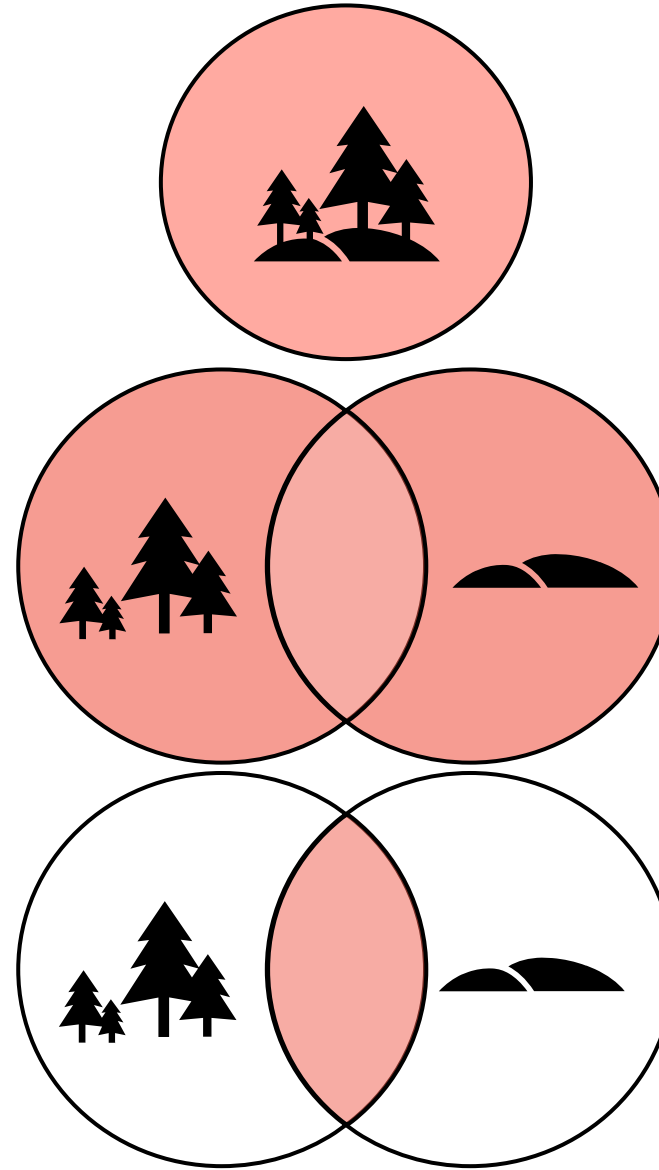
E.g. *fasting* **OR** *low-calorie diet* returns documents containing **either** term.

Combine your concept map with AND/OR

	Concept 1:	Concept 2:	Concept 3:	Concept 4:
	AND			
Synonyms	Nursing students OR Student nurse OR Nurse education OR Undergraduate nurse	Covid-19 OR Coronavirus OR Covid pandemic	Online learning OR Distance learning OR Online education OR Distance education OR E-learning	Learning outcomes OR Student success OR Success
Subject Headings (e.g. MESH)	Students, Nursing Education, Nursing	COVID-19	Education, Distance	n/a

Phrase Searching

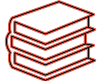
"quotation marks"
around a keyword
phrase keeps words
together in the order
specified



"forest soil"

41 

forest soil

386    

forest AND soil

386    

Truncation *

Using a truncation symbol like * expands a keyword to include all possible variations of a word.

- Child* = child, children, childhood

analysis

12 176



analysis*

11 267



analys*

13 320



analyz*

486



analy*

16 162



analysis, analyse, analyze, analyses, analyzes, analyst, analysed, analyzed, analyser, analyzer, analysers, analyzers

ana*

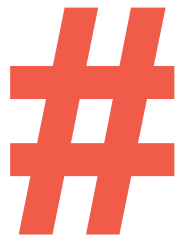
19 097



Wildcards



Replace one character to allow for variations within a word.



Behavio?r
behavior, behaviour



Wom?n
women, woman

Combine with a truncation (*) to get more variations.

Organi?ation*
organisation,
organization,
organisational,
organizational

Nesting

()

Nesting (using brackets) groups keywords together

(paracetamol OR acetaminophen)

mindfulness AND "mental health" AND teenagers OR adolescents

[Advanced](#) [Create alert](#) [Create RSS](#) [User Guide](#)

Sort by:

mindfulness AND "mental health" AND (teenagers OR adolescents)

[Advanced](#) [Create alert](#) [Create RSS](#) [User Guide](#)

Sort by:

2,391,256 results

1 ☐ Anterior vertebral tethering for **adoles** clinical experience.

Cite Braun JT, Federico SC, Lawlor DM, Paschos NJ, Cr

Spine Deform. 2024 May 26. doi: 10.1007/s4339

979 results

Feasibility and Acceptability of a Meditation Mobile App Intervention for

Page 1 of 98

Proximity Searching

ADJ/n

NEAR/n

W/n

Operators specify how close together (n) two words appear in texts.

liver* adj3 *cancer

returns results where *liver* and *cancer* are no more than 3 words apart
(*liver cancer*, *cancer of the liver*)

# ▲	Searches	Results
1	((hepat* or liver) adj4 (cancer or tumo?r* or neoplasm*)).mp.	241872
2	((hepat* or liver) and (cancer or tumo?r* or neoplasm*)).mp.	413295

((hepat* OR liver) adj4 (cancer OR tumo?r* OR neoplasm*))

Combine with **nesting** to include synonyms

Update your concept map

	Concept 1:	Concept 2:	Concept 3:	Concept 4:
	AND			
Synonyms	("nursing student*" OR "student nurs*" OR "nurs* educat*" OR "undergrad* nurs*")	(covid-19 OR coronavirus OR "covid pandemic")	("online learn*" OR "distance learn*" OR "online educat*" OR "distance educat*" OR e-learning)	("learning outcome*" OR "student success*" OR success*)
Subject Headings (e.g. MESH)	Students, Nursing Education, Nursing	COVID-19	Education, Distance	n/a

Turn your concept map into a search string

("nursing student*" OR "student nurs*" OR "nurs* educat*" OR "undergrad* nurs*")

AND

(covid-19 OR coronavirus OR "covid pandemic")

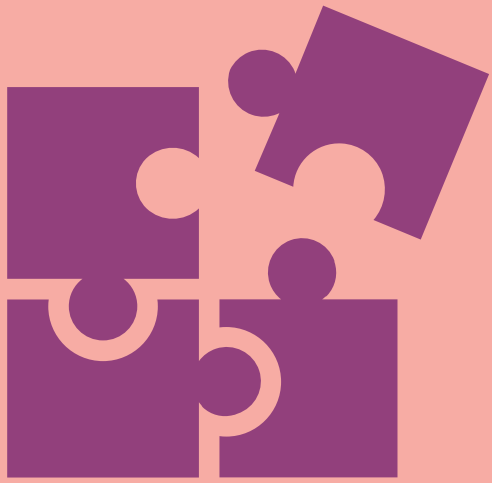
AND

("online learn*" OR "distance learn*" OR "online educat*" OR "distance educat*" OR e-learning)

AND

("learning outcome*" OR "student success*" OR success*)

There are also pre-made search strings that you can include in your search that can act as filters. For example, see page 62 of the [Cochrane Handbook- Technical Supplement](#)



Activity #3

Start listing some keywords for your concept map.



Database Searching



Types of searching

Preliminary exploratory searching

Find some seed references and check to see that no other systematic review has been completed.

Initial search:

Choose one database to do an initial search. Test your keywords and subject headings in the title and abstract filters.

Additional search:

Apply identified keywords and subject headings from your first search across all published and unpublished databases/sources.

Pearl-growing search:

Review all reference lists or "cited by" lists of relevant studies.

Selecting Databases

[Subject Guides](#) are an excellent starting point to find databases in your discipline.



Māori



Pacific



**Arts and
Education**



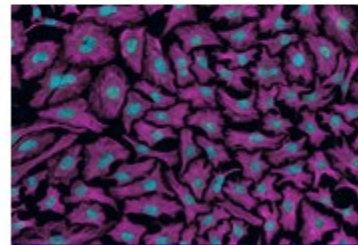
**Business and
Economics**



**Engineering and
Design**



Law



**Medical and
Health Sciences**



Science



Selecting databases

Education Research Complete

Scholarly research relating to all areas of education, curriculum instruction, administration, policy, funding, related social issues and New Zealand research.

CINAHL Complete

Nursing and Allied Health journal articles and dissertations.

ERIC

Scholarly research on all areas of education in journals, non-journal literature and audiovisual resources.

Scopus

The largest abstract and citation database of peer-reviewed literature; covers **Sciences, Engineering, Medicine, Social Sciences and some Arts.**

1

Bibliographic databases

2

Full-text databases

3

Primary source databases

4

Subject-specific databases

5

Multidisciplinary database



Example Education Research Complete Search

Search articles, books, journals & more

Searching: Education Research Complete

Basic search

	("nursing student*" OR "student <u>nurs*</u> " OR " <u>nurs*</u> <u>educat*</u> " OR "undergrad* <u>nurs*</u> ")	ⓧ	All fields	1
AND ▾	(covid-19 OR coronavirus OR "covid pandemic")	ⓧ	All fields	2
AND ▾	("online learn*" OR "distance learn*" OR "online <u>educat*</u> " OR "distance <u>educat*</u> " OR e-learning)	ⓧ	All fields	3
AND ▾	("learning outcome*" OR "student success*" OR success*)	ⓧ	All fields	4

⊕ Add row | ⊖ Delete row

Clear all Search



☐ ▾ Results: 72 ⓘ

Access Education Research Complete through the library website: https://auckland.primo.exlibrisgroup.com/permalink/64UAUCK_INST/1Ik16jl/alma99265474080202091

Example Scopus Search

Documents

Authors

Researcher Discovery

Organizations

[Search tips](#) 

Search within

Article title, Abstract, Keywords



Search documents *

("nursing student*" OR "student nurs*" OR "nurs* educat*" OR "undergrad* nurs*")



1

AND



Search within

Article title, Abstract, Keywords



Search documents

(covid-19 OR coronavirus OR "covid pandemic")



2

AND



Search within

Article title, Abstract, Keywords



Search documents

("online learn*" OR "distance learn*" OR "online educat*" OR "distance educat*" OR e-learning)



3

AND



Search within

Article title, Abstract, Keywords



Search documents

("learning outcome*" OR "student success*" OR success*)



4

87 documents found

[Advanced search](#) >

[Search](#) 

Access Scopus through the library website: https://auckland.primo.exlibrisgroup.com/permalink/64UAUCK_INST/1lk16jl/alma99134396714002091



UNIVERSITY OF
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NEW ZEALAND

Additional Filters & Limitations

Many databases have built-in **filters** and **limits**

e.g., publication date, study type, age of participants, human/animal studies, etc.

! Some of these filters can be a little unreliable so it is important to test them out before finalising your search.

Limits

☐ Abstracts	☐ Structured Abstracts	☐ English Language
☐ No Language Specified	☐ All EBMR Article Reviews	☐ Evidence Based Medicine Reviews
☐ Male	☐ Animals	☐ Female
☐ Ovid Full Text Available	☐ Article Reviews (ACP Journal Club)	☐ Full Text
☐ Review Articles	☐ Article Reviews (DARE)	☐ Humans
☐ Topic Reviews (Cochrane)	☐ Core Clinical Journals (AIM: Discontinued in 2020)	☐ Clinically Useful Journals (JMLA July 2023)
☐ Latest Update	☐ Pharmacologic Actions	☐ Remove Preprint Records
☐ COVID-19		
☐ Publication Year		
- ▼ - - ▼		

Ensuring your search is robust

To make sure you are finding all relevant data, ask yourself the following questions:

Are you searching in **enough places** or using enough **search terms**?



How will you find relevant papers from **other regions** and in **other languages**?

How will you access any relevant data that may be **unpublished** or not found in the usual databases?

Image made by [Freepik](https://www.storyset.com) from www.storyset.com

Managing Search Results

Keep a record of:

- **Number of results** for each database searched.
- **Date** you ran each search.
- **Search strategies** for each database.
- **Databases used.**

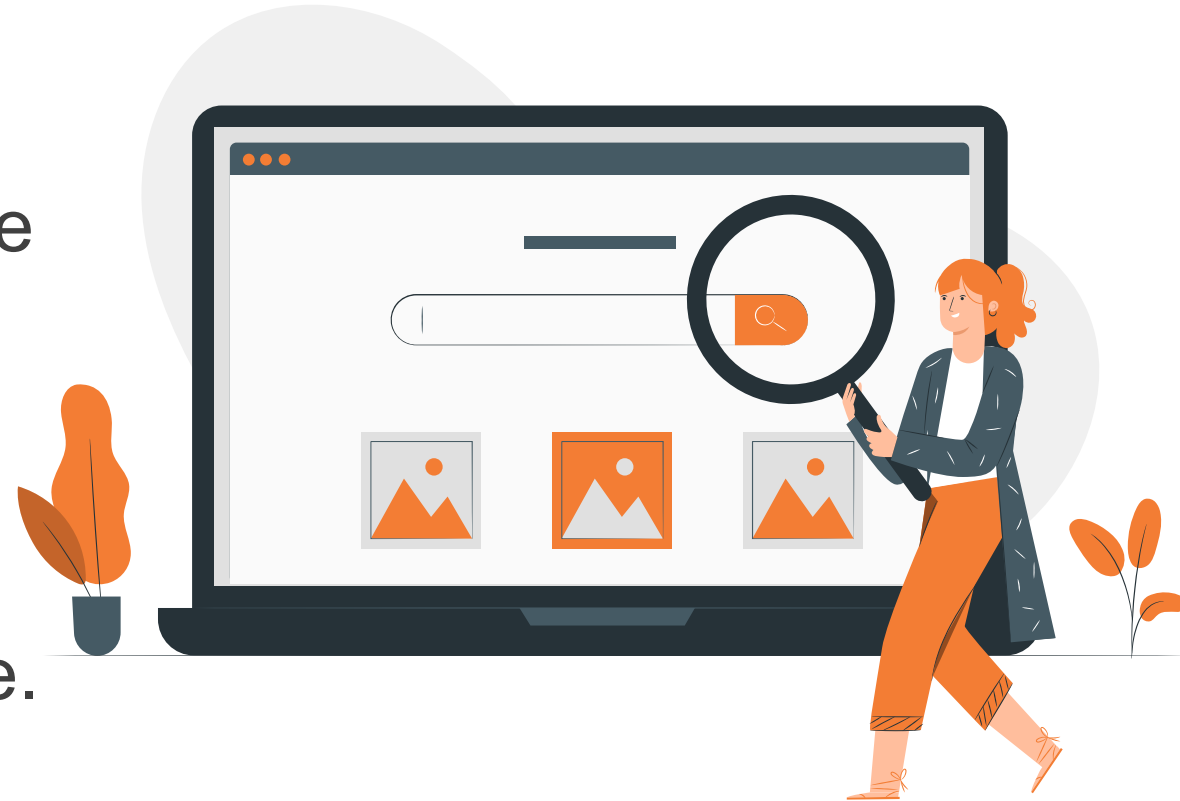


Image made by [Freepik](https://www.storyset.com) from www.storyset.com

Reference Management Systems

Reference management tool	RefWorks	EndNote	Mendeley	Zotero
Who can use?	Staff, students, and alumni.	Staff and postgraduate students.	Staff and students.	Staff and students.
Access	Web-based. Access from anywhere with internet. RefWorks .	Desktop. Can sync with EndNote Web. Additional database filters , connection files and output styles can be downloaded from the EndNote Download page.	Desktop. Can sync with Mendeley web account. When creating your account click 'Continue.' Do not click 'Sign in via your institution, organization or Athens' as you won't be able to use Mendeley Desktop.	Web-based and Desktop versions. Can sync with Zotero web account.
Cost	Free to staff and students.	Home use - \$7 (Staff and Postgraduates only).	Free	Free

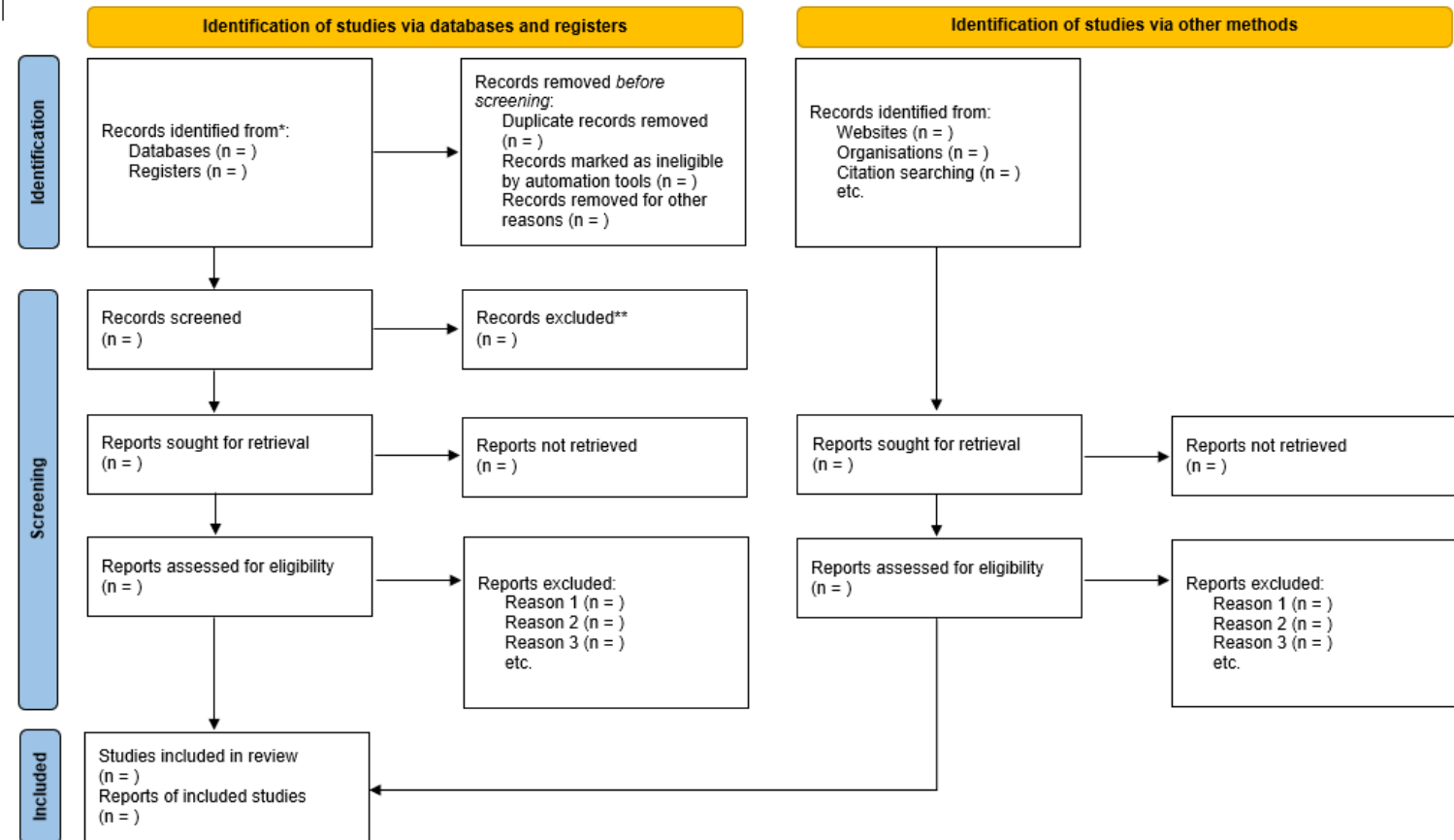
Find out more through our Learning Essentials page: <https://learningessentials.auckland.ac.nz/referencing/reference-management-tools/>

PRISMA Diagram

PRISMA Statement

- Enhances systematic review and meta-analysis reporting quality.
- 27-item checklist and a four-phase flow diagram for improved reporting.

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases, registers and other sources



*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).

**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71. For more information, visit: <http://www.prisma-statement.org/>

»»» Next steps

Screening Results

Two or more independent reviewers use the **inclusion and exclusion criteria** (established in the **protocol**) to select the relevant studies.

A third reviewer can mediate any disagreements.

There are tools available to help assist you with the screening process:



Steps for Screening Results

- **Pre-screening:** Record the numbers of results from each database (or other source) before screening commences. **PRISMA Statement** is useful here.
- **Remove duplicates:** Most reference managers have a tool to facilitate this, or you can do it by hand in Excel, etc.
- **Title/abstract screening:** Reviewers scan titles and abstracts to see if they match the inclusion/exclusion criteria or have some value to the systematic review.
- **Full-text screening:** Reviewers look through the full-text of included articles to fine-tune the final collection of articles that will contribute to the review. You will need to provide reasons for exclusion at this step.

Appraise Studies

Critical appraisal involves **evaluating the quality and reliability** of the studies you include. This ensures that the evidence you use is strong and trustworthy.

The [process for appraising studies](#) is available on our Systematic Review Guide.

We also have a list of [recommended appraisal tools and checklists](#) for a variety of study types.

Extract Data

Data extraction involves summarising studies in a consistent format for later synthesis and identifying any numerical data needed.

Elements of each study, such as **methods, participants, setting, interventions, outcome, results, and publications**, etc. will be noted down into a data extraction form.

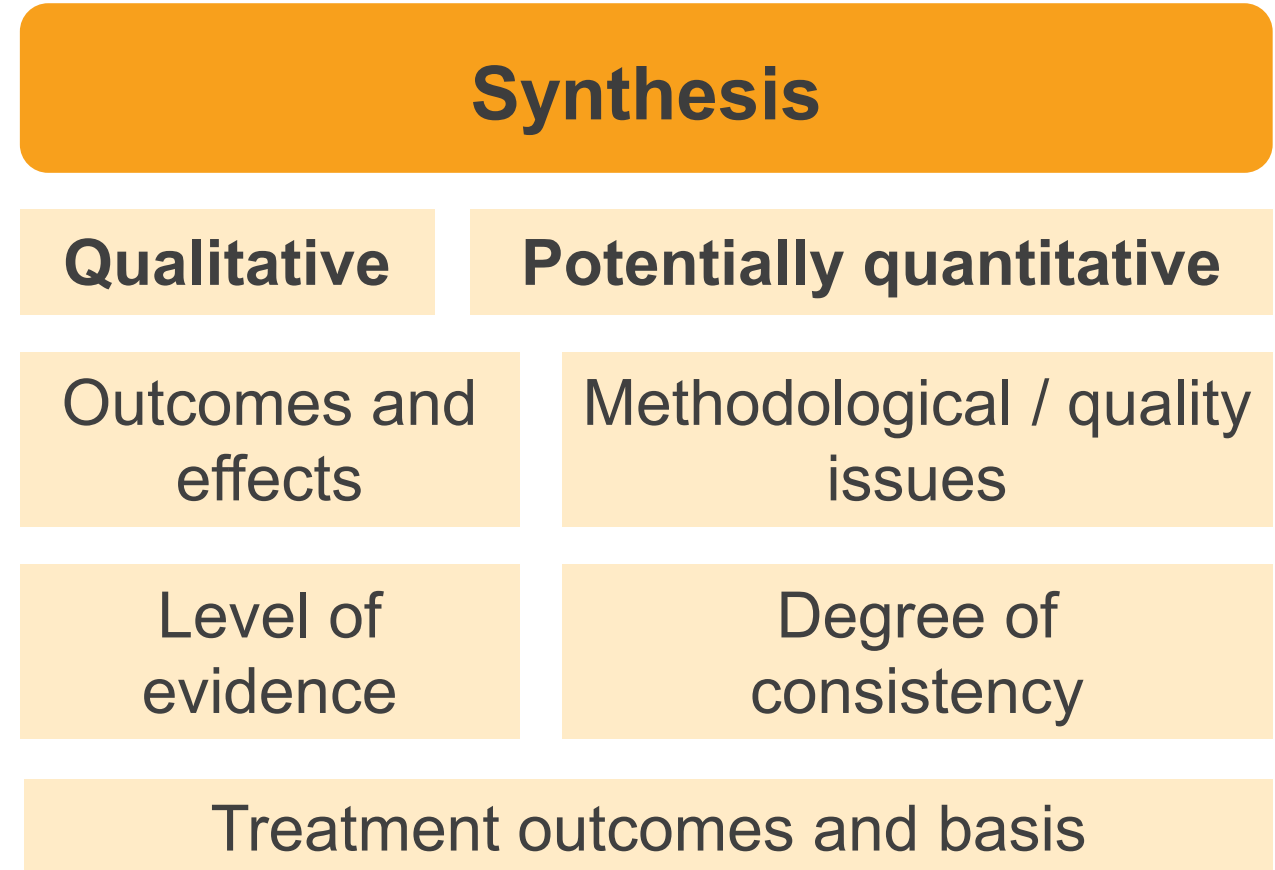
The [section on extracting data](#) in the Systematic Review Guide has an overview of steps and templates to guide you.

Synthesise and Interpret Results

Pick a synthesis method that fits your research question and data type to combine the results, for example meta-analysis or another statistical method if meta-analysis is not possible.

Some examples are:

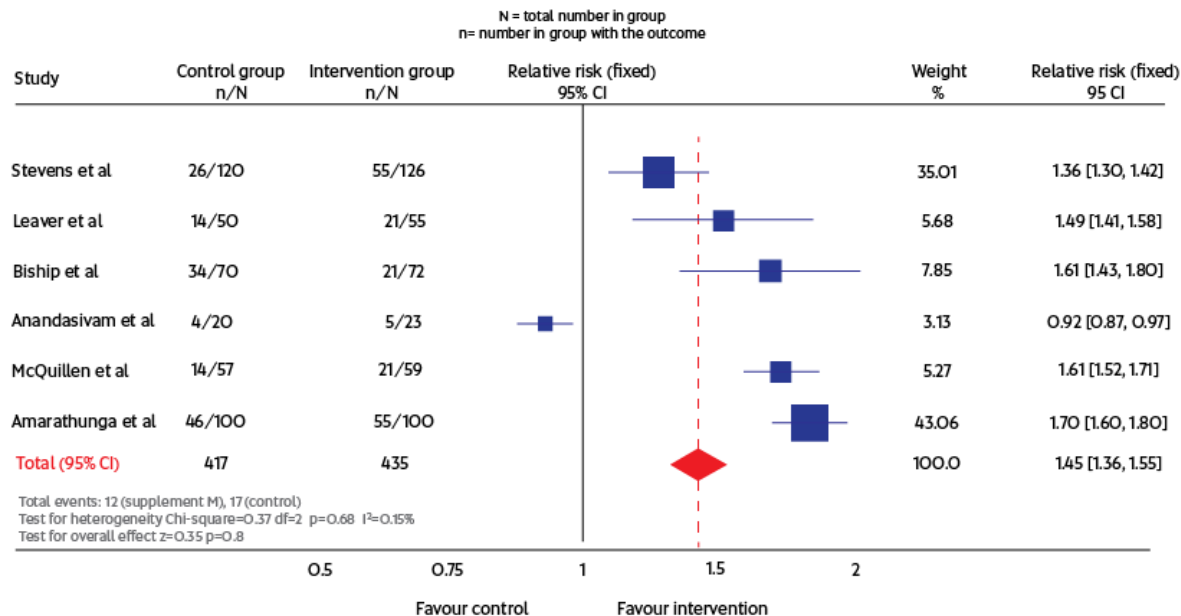
- Narrative synthesis
- Meta-analysis
- Thematic synthesis
- Qualitative comparative analysis



Quantitative Data Synthesis

This might include a Meta-analysis which is a statistical method for analysing the differences of the selected studies and their effects. You may also include a tree plot.

Review: For adult males, how effective are muscle relaxants compared to opioids in the management of back pain?



Feasibility and sensibility depends on data available & team skillset

- Clinical and methodological similarity
- Consistent study quality
- Team has statistical expertise

Further Reading:

Lee, C.H., et al. (2016). [Comparison of two meta-analysis methods: Inverse-variance-weighted average and weighted sum of z-score](#). *Genomics & Informatics*, 14(4), 173–180.

Neyeloff, J. L., et al. (2012). [Meta-analyses and Forest plots using a microsoft excel spreadsheet: Step-by-step guide focusing on descriptive data analysis](#). *BMC Research Notes*.

Qualitative Data Synthesis

There are various methods that can be used for synthesising qualitative research. This might include narrative descriptions, a thematic analysis, or content analysis.

Thematic analysis	Content analysis
Thematic analysis is a method of qualitative data analysis that can be used with varying research designs	Content analysis is a data analysis method that can be used to analyze both quantitative and qualitative data
Analyses qualitative data	Analyses both qualitative and quantitative data
Helps the researcher create a logical structure for the research	Content data analyzed through content analysis can help to identify frequencies of data
Researcher focuses more on the frequency of the occurrence of various categories	Researcher's focus is on identifying themes and developing the analysis in the most cohesive manner possible

Adapted from www.pediaa.com

Further Reading:

Korhonen, A., et al. (2013). [Meta-synthesis and evidence-based health care - a method for systematic review](#). *Scandinavian Journal of Caring Sciences*, 27(4), 1027–1034.
Barnett-Page, E., & Thomas, J. (2009) [Methods for the synthesis of qualitative research: a critical review](#). *BMC medical research methodology*, 9, Article 59.

Writing and Publishing

Writing a systematic review involves presenting a clear, structured, and comprehensive summary of evidence:

- Outline of [systematic review structure](#)
- [JBI guidelines for systematic review report writing](#)

Publishing involves preparing your work for dissemination in a peer-reviewed journal or other academic platform. For more information see our [UoA Publishing Guide](#).



Image made by Freepik from www.storyset.com



Need more help?



Additional Support

- One-on-one support service for systematic reviews
- Library's AskUs form

Upcoming workshops

- Searching Medline effectively
- Post graduate workshops

