# Systematic literature searches and reviews in context with the Prisma guideline

TALL LAB

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2023-09-26

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# Workshop Outline

**Concepts and Methodologies**

●Literature reviews

Qs and As

**Systematic Search and Reviews**

●About Prisma (flow diagram)

●Key steps for literature search (Discussion: Effective search strategies)

Qs and As

**Review (Analysis) Methods**

●Critical aspects of data extracting (Discussion: Research questions and coding schemes)

●Alignments: Research questions and data analysis methods

●Baseline facts report and presentation

Qs and As

**Write Up**

●Critical aspects of systematic review

●Evaluate important evidences against research questions of your interest

●Results summaries, discussions versus interpretations

Qs and As

## Concepts

- Systematic review
- Research synthesis
- Meta-synthesis
- Meta-analysis
- Scoping review
- Rapid review

# LITERATURE REVIEW

A literature review is an introductory part of an academic paper that contains a critical evaluation of the paper in the form of a written report.

The purpose of a literature review is to provide the reader with background information of the academic paper.

The main parts of a literature review are: context and background information, importance of the research, gaps in the literature, the writer's objective and the thesis statement.

We can find good examples of literature reviews in science magazines or websites.

**Literature review**: A generic term for an article that provide a narrative summary of the literature on a given topic. It may or may not include a comprehensive search or quality assessment.

**A systematic review** attempts to collate all the empirical evidence that fits pre-specified eligibility criteria to answer a specific research question. https://training.cochrane.org/cochrane-training

**A scoping review**: A form of knowledge synthesis "addresses an exploratory research question aimed at mapping key concepts, types of evidence, and gaps in research related to a defined area or field by systematically searching, selecting, and synthesizing existing knowledge."

**Meta-analysis**: A type of systematic review that has a statistical analysis of the data pooled from multiple studies that meet the inclusion criteria. Not all systematic reviews include meta-analysis, but all meta-analyses will include a systematic review of the evidence.

**Rapid reviews** are "a form of knowledge synthesis in which components of the systematic review process are simplified or omitted to produce information in a timely manner."

https://guides.hsict.library.utoronto.ca/SMH/systematic/types

**Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)**

- An evidence-based minimum set of items for reporting in systematic reviews and meta-analyses.
- It primarily focused on the reporting of reviews evaluating the effects of interventions but can also be used as a basis for reporting systematic reviews with objectives other than evaluating interventions.
- That is, reviews of effect and impact measured using quantitative and qualitative instruments.
- The reviews can be conducted using quantitative and qualitative data extraction and analysis methods.
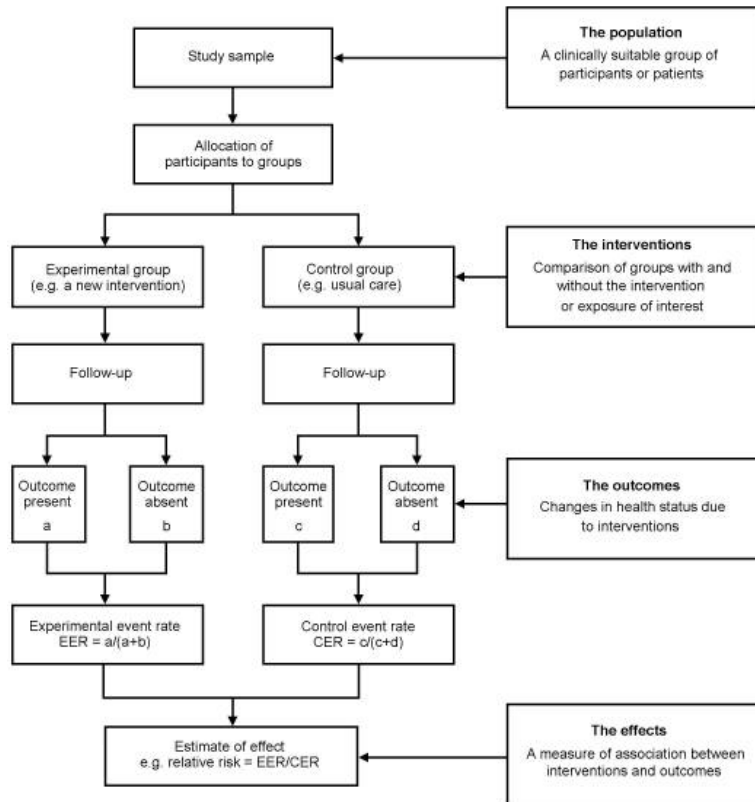


Why systematic reviews matter

https://beta.elsevier.com/connect/why-systematic-reviews-matter?trial=true

# Methodologies: Processing extant results and secondary data



If our reviews focus on the effect measured using quantitative instruments, such as test scores, what are the review methods we can use?

If our reviews focus on the impacted examined using quantitative instruments, such as interviews, what are the review methods we can use?

# Who use PRISMA?

- Researchers/authors: improve the reporting of systematic reviews and meta-analyses.
- Journal Peer reviewers and editors: conduct critical appraisal of published systematic reviews.

*Please note: Prisma is not a quality assessment instrument to gauge the quality of a systematic review.



https://infectioncontrol.tips/2016/04/08/systematic-review-process/
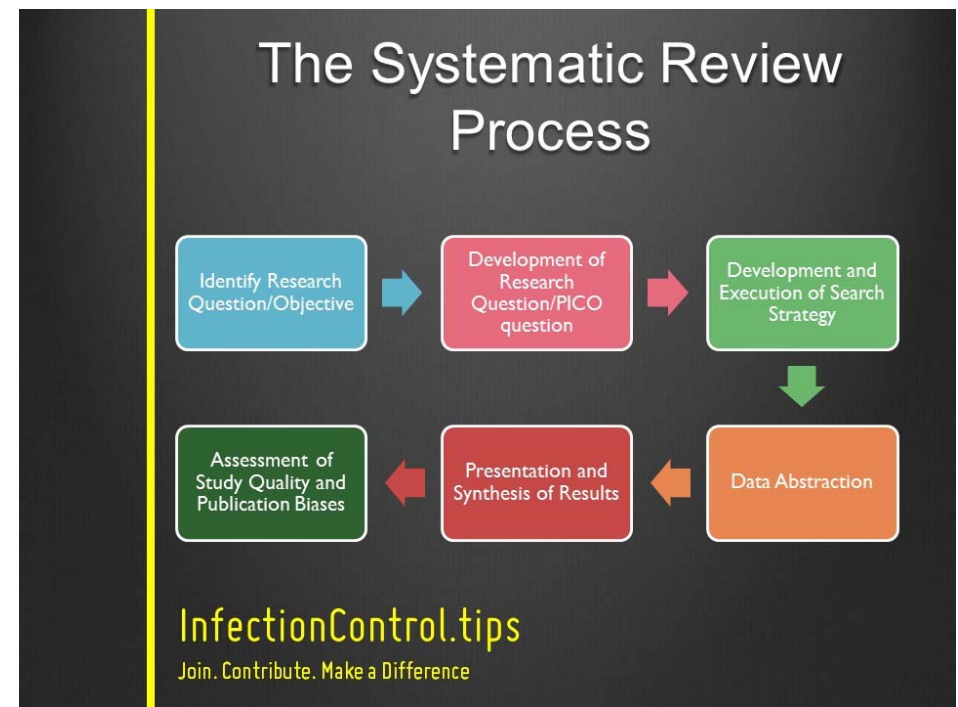
## Registration

PROSPERO is an international database of prospectively registered systematic reviews in health and social care. Key features from the review protocol are recorded and maintained as a permanent record. Systematic reviews should be registered at inception (i.e. at the protocol stage) to help avoid unplanned duplication and to enable comparison of reported review methods with what was planned in the protocol.

To register your review of learn more about PROSPERO, click here.

PROSPERO
International prospective register of systematic reviews

# PRISMA
### TRANSPARENT REPORTING of SYSTEMATIC REVIEWS and META-ANALYSES

Several translations of the PRISMA publications and documents are available. These have been translated by kind volunteers and are freely available on the PRISMA website.

## Available Translations

### PRISMA 2020

| | Checklist | Flow Diagram | Statement | E&E |
|---|---|---|---|---|
| **Chinese (Simplified)** | 📄📄 | n/a | n/a | n/a |
| **Chinese (Traditional)** | 📄📄 | 📄 | n/a | n/a |
| **Croatian** | n/a | n/a | 📄 | n/a |
| **Greek** | 📄 | 📄 | 📄 | n/a |
| **Italian** | 📄 | 📄 | 📄 | n/a |
| **Japanese** | 📄📄 | 📄 | 📄 | n/a |
| Korean | 📄📄📄 | 📄📄📄 | n/a | n/a |
| **Portuguese (Brazil)** | 📄📄 | n/a | n/a | n/a |
| **Portuguese (European)** | 📄📄 | 📄 | n/a | n/a |
| **Spanish** | 📄 | 📄 | 📄 | n/a |
| **Turkish** | 📄📄 | n/a | n/a | n/a |

### PRISMA 2009

| | Checklist | Flow | Statement | E&E |
|---|---|---|---|---|
| French | n/a | 📄 | n/a | n/a |

## PRISMA Flow Diagram

The flow diagram depicts the flow of information through the different phases of a systematic review. It maps out the number of records identified, included and excluded, and the reasons for exclusions. Different templates are available depending on the type of review (new or updated) and sources used to identify studies.

- PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only

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

- PRISMA 2020 flow diagram for updated systematic reviews which included searches of databases and registers only

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

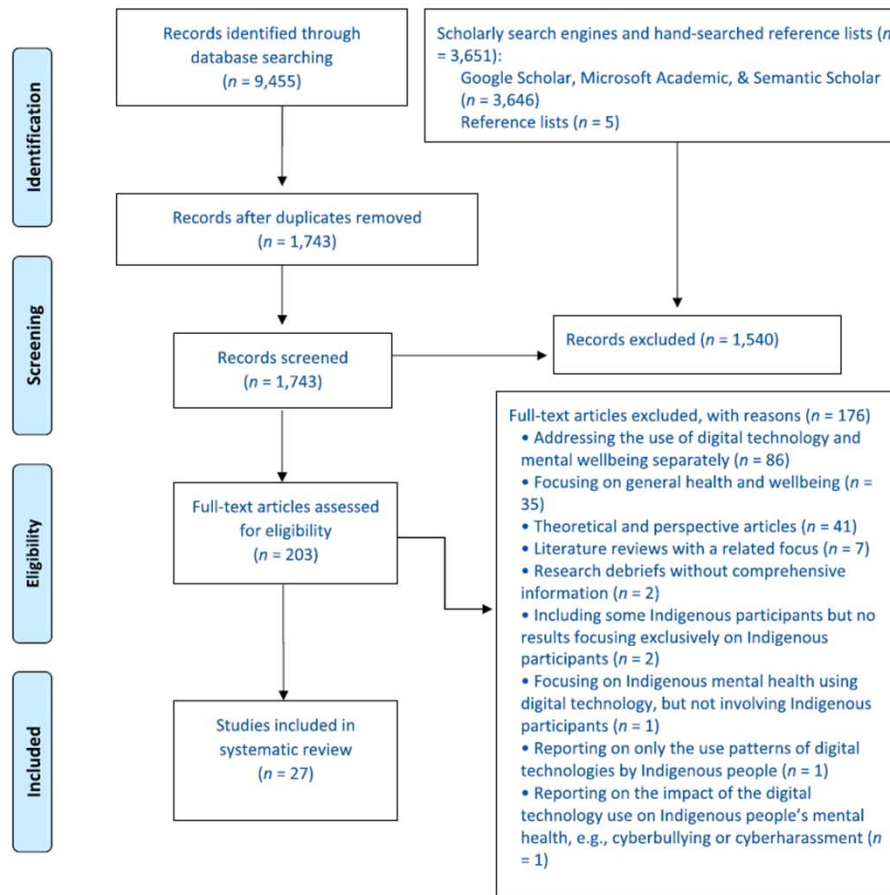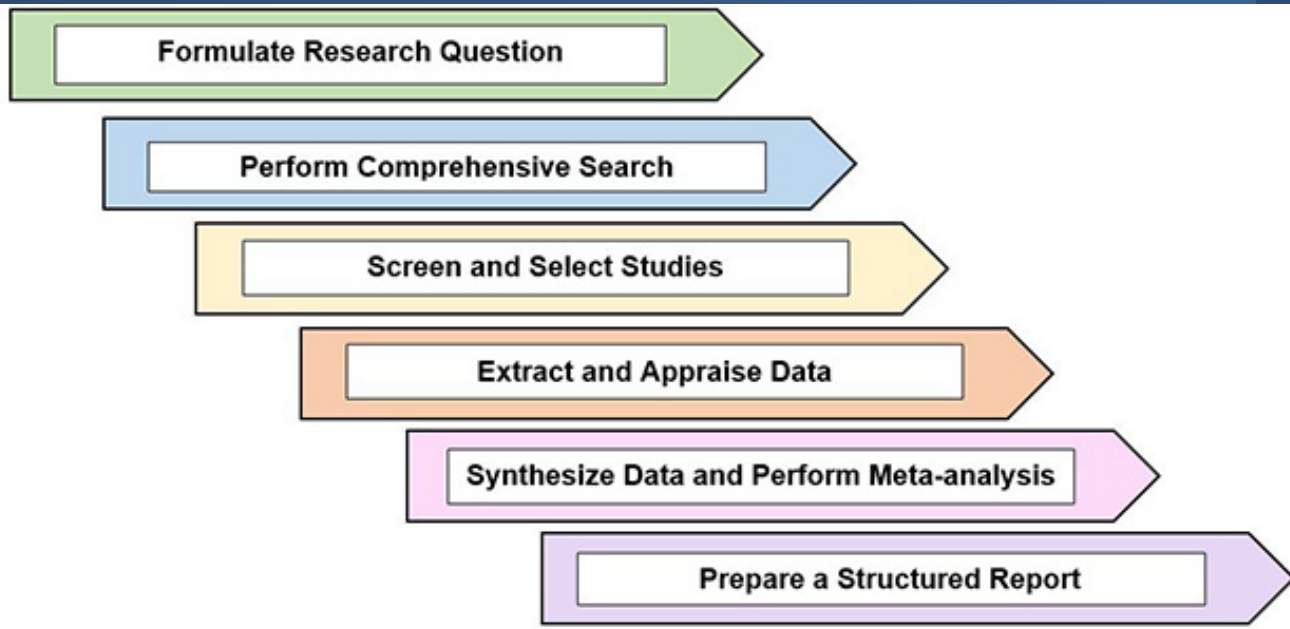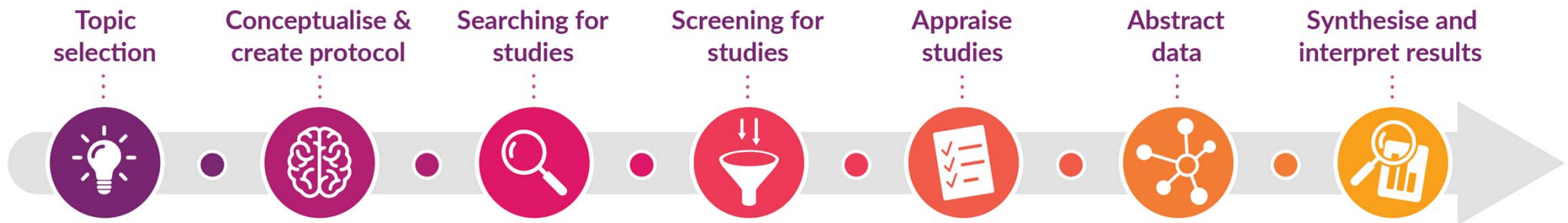Flow diagrams can also be generated using a Shiny App available at https://www.eshackathon.org/software/PRISMA2020.html

For more information about citing and using PRISMA click here.

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

| Identification of studies via databases and registers | Identification of studies via other methods |
| --- | --- |

**Identification**

Records identified from*:
Databases (n = )
Registers (n = )

Records removed *before screening*:
Duplicate records removed (n = )
Records marked as ineligible by automation tools (n = )
Records removed for other reasons (n = )

Records identified from:
Websites (n = )
Organisations (n = )
Citation searching (n = )
etc.

**Screening**

Records screened (n = )

Records excluded** (n = )

Reports sought for retrieval (n = )

Reports not retrieved (n = )

Reports sought for retrieval (n = )

Reports not retrieved (n = )

Reports assessed for eligibility (n = )

Reports excluded:
Reason 1 (n = )
Reason 2 (n = )
Reason 3 (n = )
etc.

Reports assessed for eligibility (n = )

Reports excluded:
Reason 1 (n = )
Reason 2 (n = )
Reason 3 (n = )
etc.

**Included**

Studies included in review (n = )
Reports of included studies (n = )

*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.

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

| | Previous studies | Identification of new studies via databases and registers | Identification of new studies via other methods |

**Identification**

Studies included in previous version of review (n = )

Reports of studies included in previous version of review (n = )

Records identified from*:
Databases (n = )
Registers (n = )

Records removed *before screening*:
Duplicate records removed (n = )
Records marked as ineligible by automation tools (n = )
Records removed for other reasons (n = )

Records identified from:
Websites (n = )
Organisations (n = )
Citation searching (n = )
etc.

**Screening**

Records screened (n = )

Records excluded** (n = )

Reports sought for retrieval (n = )

Reports not retrieved (n = )

Reports sought for retrieval (n = )

Reports not retrieved (n = )

Reports assessed for eligibility (n = )

Reports excluded:
Reason 1 (n = )
Reason 2 (n = )
Reason 3 (n = )
etc.

Reports assessed for eligibility (n = )

Reports excluded:
Reason 1 (n = )
Reason 2 (n = )
Reason 3 (n = )
etc.

New studies included in review (n = )
Reports of new included studies (n = )

**Included**

Total studies included in review (n = )
Reports of total included studies (n = )

*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/

| | Records identified through database searching (*n* = 9,455) | Scholarly search engines and hand-searched reference lists (*n* = 3,651): Google Scholar, Microsoft Academic, & Semantic Scholar (*n* = 3,646) Reference lists (*n* = 5) |

**Identification**

Records after duplicates removed (*n* = 1,743)

**Screening**

Records screened (*n* = 1,743) → Records excluded (*n* = 1,540)

**Eligibility**

Full-text articles assessed for eligibility (*n* = 203)

Full-text articles excluded, with reasons (*n* = 176)
- Addressing the use of digital technology and mental wellbeing separately (*n* = 86)
- Focusing on general health and wellbeing (*n* = 35)
- Theoretical and perspective articles (*n* = 41)
- Literature reviews with a related focus (*n* = 7)
- Research debriefs without comprehensive information (*n* = 2)
- Including some Indigenous participants but no results focusing exclusively on Indigenous participants (*n* = 2)
- Focusing on Indigenous mental health using digital technology, but not involving Indigenous participants (*n* = 1)
- Reporting on only the use patterns of digital technologies by Indigenous people (*n* = 1)
- Reporting on the impact of the digital technology use on Indigenous people's mental health, e.g., cyberbullying or cyberharassment (*n* = 1)

**Included**

Studies included in systematic review (*n* = 27)

Fig. 1. PRISMA 2009 Flow Diagram of the complete search process.

4

# Steps in a systematic review

| Topic selection | Conceptualise & create protocol | Searching for studies | Screening for studies | Appraise studies | Abstract data | Synthesise and interpret results |

The Karolinska Institute, a research-led medical university in Solna within the Stockholm urban area of Sweden.

# STEPS 1-3:

• Identify your topic with clarity, considering a flexible workload estimate

• Define your operation concepts with reputable references

• Use exhaustive and effective search terms (tips: Write down all relevant keywords, put Boolean terms, choose the suitable filters, conduct preliminary searches)

e.g., let's do a small exercise; give me a topic of your interest …

A must step: Consult our VERY helpful Liberians, Chelsie Lalonde and Heather McTavish (Heather.McTavish@ontariotechu.ca)

Regarding: Keywords,

Databases with different, specialized coverages

- Go to Ontario Tech Library to start your preliminary search
- Go to Research Guides

Select your faculty and domain

**Refine Results**

Current Search ▾
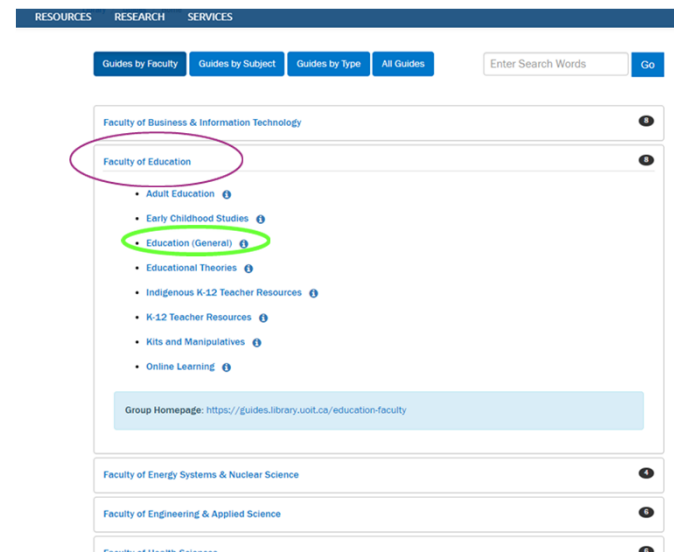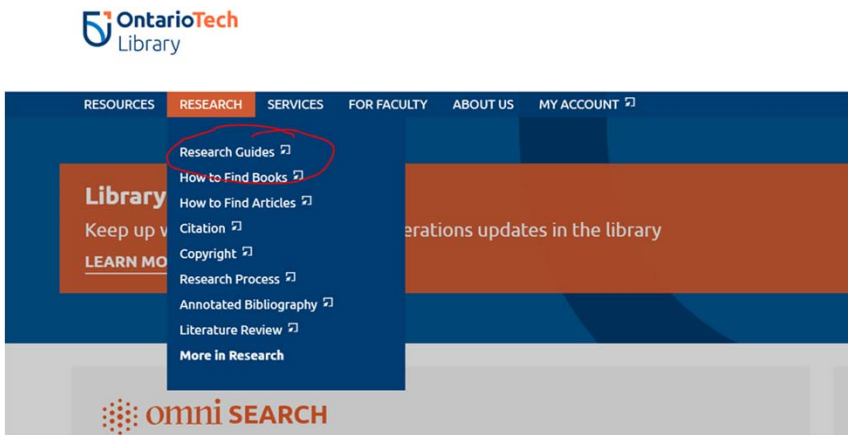
Boolean/Phrase:
( indigenous or native or aboriginal or indians or first nations ...

Expanders
Apply equivalent subjects ☒

Limit To ▾
☐ Full Text
☐ References Available
☐ Scholarly (Peer Reviewed) Journals

From: 1976 — Publication Date — To: 2021

Show More

Source Types ▾
☐ All Results
☐ Academic Journals (693)
☐ Magazines (77)
☐ Conference Papers (17)
☐ Newspapers (7)
☐ Book Reviews (6)
Show More

Subject ▸

Publication ▸

Search Results: 1 - 20 of 817

1. On cultural others working with **Aboriginal** and Torres Strait Islander educators and communities: Courtney B. Cazd
By: Cazden, Courtney B.; Luke, Allan. Curriculum Inquiry, Mar2019, Vol. 49 Issue 2, p242-251, 10p; DOI: 10.1080/03626784.2019.1591923
Subjects: Teacher education; Critical literacy; Critical pedagogy; Indigenous peoples; Aboriginal Australians
Academic Journal
Full text @ Ontario Tech

2. Understanding the need: Using collaboratively created draft guiding principles to direct **online synchronous learnin**
By: Eady, Michelle; Woodcock, Stuart. International Journal for Educational Integrity, 2010, Vol. 6 Issue 2, p24-40, 17p, 1 Chart; DOI: 10.21913/ijei.v6i2.701
Subjects: Computer literacy; Internet literacy; Stochastic learning models; Australia; Information & communication technologies; Aboriginal Australians
Academic Journal

Times Cited in this Database: (2)
📄 PDF Full Text (261KB)   Full text @ Ontario Tech

3. **TESOL** and TESD in Remote **Aboriginal** Australia: The "True" Story?
By: Cadman, Kate; Brown, Jill. TESOL Quarterly, September 2011, Vol. 45 Issue 3, p440-462, 23p
Subjects: Australia; Aboriginal Australians; English as a foreign language; English language education; Narration (Rhetoric); Education research methodolog
Academic Journal
Cited References: (52) Times Cited in this Database: (1)
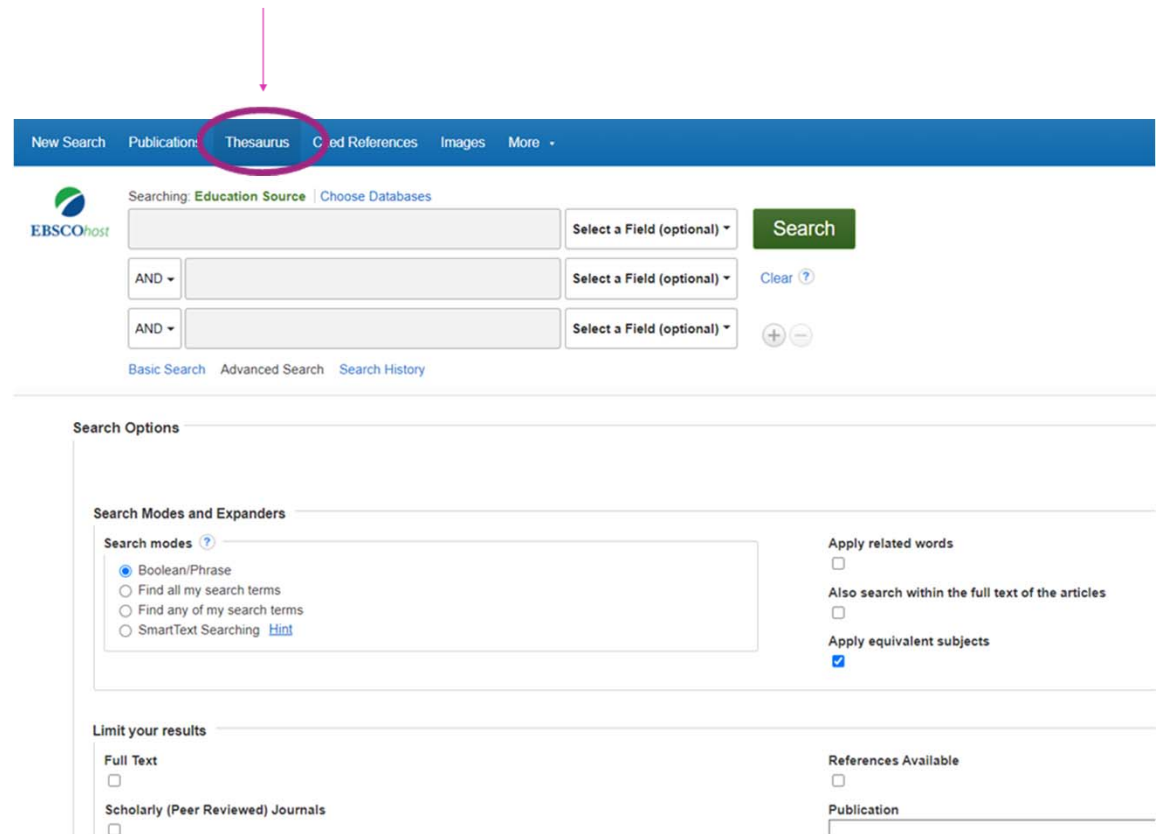Full text @ Ontario Tech

4. **Digital storytelling** as a disciplinary **literacy** enhancement tool for EFL students.
By: Chubko, Nadezhda; Morris, Julia E.; McKinnon, David H.; Slater, Eileen V.; Lummis, Geoffrey W.. Educational Technology Research & Development, 2020, V
Subjects: English as a foreign language; Computer assisted language instruction; Literacy; Educational technology; Digital media; Kyrgyzstan; Language Sc
Academic
Cited References: (51)

In the case you cannot search with your keywords, go to the Education Source database. Click on Thesaurus (at the very top of the page).

**Browsing: Education Source - Thesaurus**

| literacy | Browse |

○ Term Begins With  ● Term Contains  ○ Relevancy Ranked

**Page:** Previous    Next ▸

Select term, then add to search using: | OR ∨ | Add |

(Click term to display details.)

| | |
|---|---|
| ☐ | Literacy |
| ☐ | Literacy programs |
| ☐ | Media literacy |
| ☐ | Family literacy |
| ☐ | Computers & literacy |
| ☐ | Literacy education |
| ☐ | Computer literacy |
| ☐ | Workplace literacy |
| ☐ | Technological literacy |
| ☐ | Music literacy education |
| ☐ | Internet literacy |
| ☐ | Environmental literacy |
| ☐ | Critical literacy |
| ☐ | Functional literacy |
| ☐ | Emergent literacy research |
| ☐ | Visual literacy |
| ☐ | Literacy standards |
| ☐ | Literacy research |
| ☐ | Literacy programs -- Finance |
| ☐ | Literacy education websites |
| ☐ | Literacy education research |

**Page:** Previous    Next ▸

To find the relevant databases, go to Ontario Tech library, on Resources, and click on

# Database A-Z
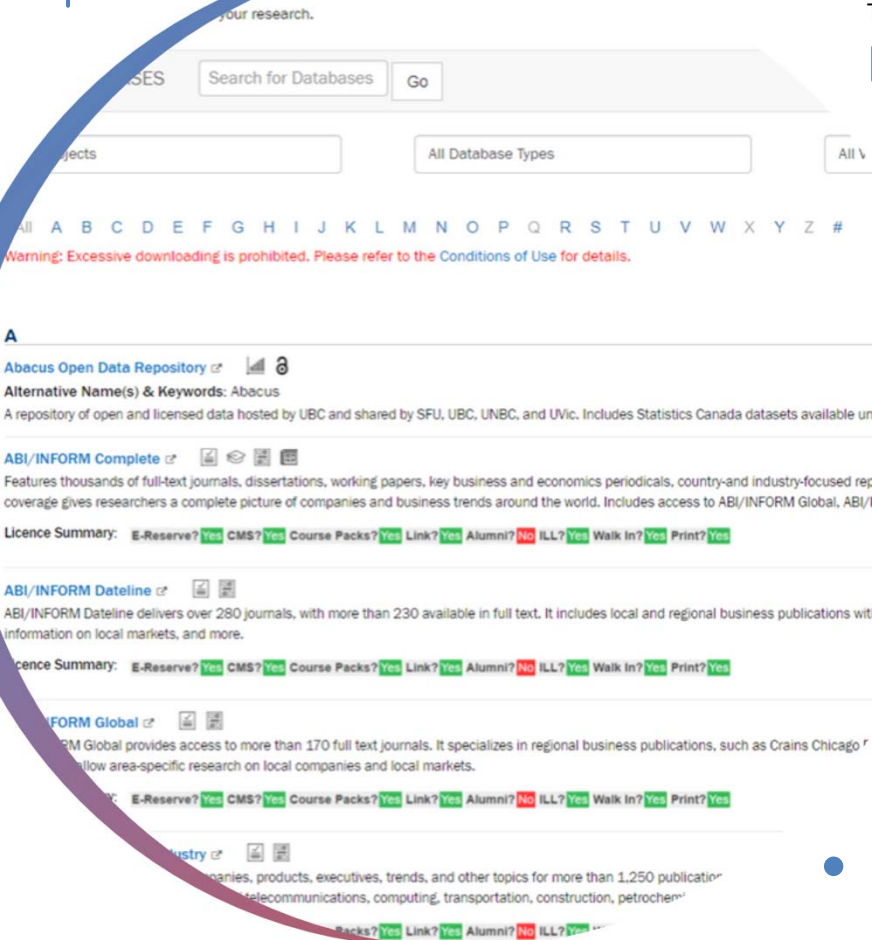
**1** Read through all databases and identify all the relevant ones with consultation of the liberians.

**2** Use other Search Engines such as Google Scholar, ERIC, Microsoft Academia.

**3** Hand search procedures

Choosing one database at a time, you can identify how many articles you find in each database, and how many are relevant.

**EBSCOhost**

Searching: **Academic Search Premier** | Choose Databases

| | Select a Field (optional) ▾ | **Search** |

AND ▾ | | Select a Field (optional) ▾ | Clear ?

AND ▾ | | Select a Field (optional) ▾ | ⊕ ⊖

Basic Search   Advanced Search   Search History

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**Choose Databases** ?

**Detailed View** (Title lists included)

☐ Select / deselect all

**OK**   **Cancel**

☑ Academic Search Premier 🔲          ☐ Humanities International Index 🔲

☐ AHFS Consumer Medication Information 🔲          ☐ Library, Information Science & Technology Abstracts 🔲

☐ Alt HealthWatch 🔲          ☐ MAS Ultra - School Edition 🔲

☐ Audiobook Collection (EBSCOhost) 🔲          ☐ MasterFILE Elite 🔲

☐ Business Source Complete 🔲          ☐ MEDLINE 🔲

☐ Canadian Reference Centre 🔲          ☐ Military & Government Collection 🔲

☐ CINAHL 🔲          ☐ Primary Search 🔲

☐ CINAHL Plus with Full Text 🔲          ☐ Regional Business News 🔲

☐ Communication & Mass Media Complete 🔲          ☐ SPORTDiscus with Full Text 🔲

☐ Criminal Justice Abstracts with Full Text 🔲          ☐ EconLit with Full Text 🔲

☐ eBook Collection (EBSCOhost) 🔲          ☐ Computers & Applied Sciences Complete 🔲

☐ Education Source 🔲          ☐ The Serials Directory 🔲

☐ Environment Complete 🔲          ☐ Bibliography of Native North Americans 🔲

☐ ERIC 🔲          ☐ MAS Reference eBook Collection 🔲

**STEP 4**

Screening abstracts : Basic inclusion criteria, e.g., empirical studies

Screening full length articles: Read method section first against inclusion criteria with Prima flow diagram
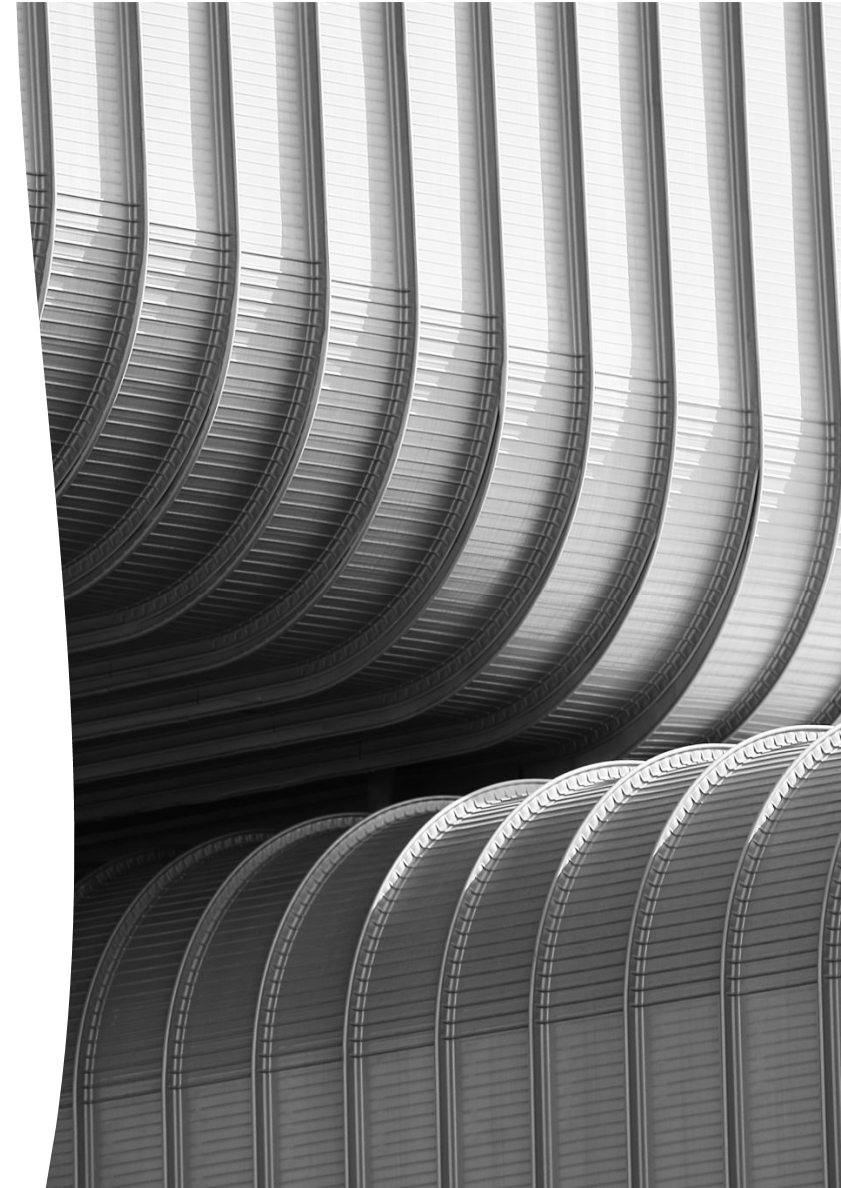
Using multiple folders for careful documentation

Problematic articles: Discussion with your supervisor and co-author team; do not hesitate to defend your perspectives while being open minded

Read…read…read CAREFULLY and you need to spend time on it.

## STEP 5: Extracting information- developing a coding scheme

**What matters: Two aspects**

1. Baseline research information of individual studies, e.g.,…

2. Research questions, e.g.,…

**A coding scheme with multiple tiers, capturing critical information**

e.g., digital technologies for Indigenous people's mental health; digital technologies for Indigenous people's language and literacy skill development

- Indigenous groups, location, participants
- Nature of research inquiries
- Types of digital technologies
- Language and literacy practices
- Interventions used to help Indigenous learners
- Perspectives of stakeholders

On Google Drive, Microsoft Word or Excel, create a table
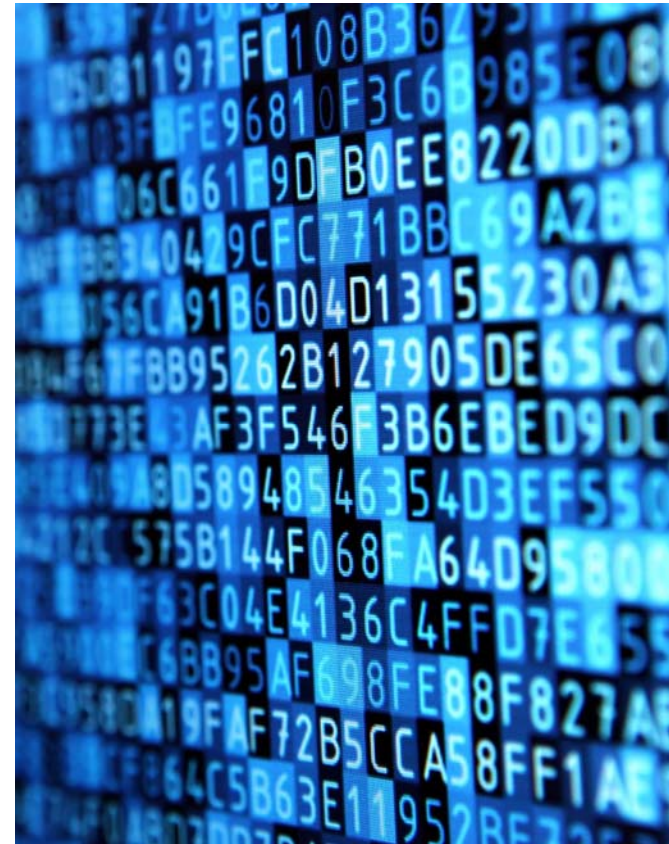
health.
    Finally, it is clear from this review that only a holistic, culturally responsive approach will be effective to address Indigenous people's mental health challenges. We also suggest that technology-based mental health programs be tailored to specific Indigenous communities to ensure their relevance and implementation fidelity. For example, a school-based eMH program or multimedia project should be designed in collaboration among researchers, health professionals, technology specialists, Indigenous youth, teachers, and Indigenous community

### Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chb.2021.106988.

### Appendix B. Empirical studies on digital technology use for Indigenous mental health and wellbeing (n = 27)

| Author(s) | Participants | Location | Research objectives | Methods (approach and/or research instruments) | Key findings |
|---|---|---|---|---|---|
| 1. Beltran and Begun (2014) | 6 Māori university students, faculty, and staff (20–45 y/o) | New Zealand | To examine the effect of a community-based digital storytelling workshop on resilience amidst historical trauma | • Digital stories<br>• Post-workshop in-depth interviews<br>(Narrative inquiry) | • Participants recognized power of language to articulate and understand experiences of historical trauma.<br>• Digital storytelling facilitated a healing process allowing for self-expression and interconnectedness.<br>• Participants recognized digital storytelling can be used as an effective tool for holistic health promotion. |
| 2. Bennett-Levy et al. (2017) | 26 Aboriginal & Torres Strait Islander health professionals (21 Indigenous) | Australia | To examine barriers and enablers of eMH services for Indigenous Australians via a training program and succeeding consultation | • Participant follow-up consultation sessions with trainers<br>• Trainers' written reports detailing their consultations with participants<br>• Trainer interviews | • Moderate uptake of eMH (22–30% of participants)<br>• Challenges to uptake: organizational barriers (demanding workloads, lack of fit between organizational structure and introduction of new technologies) and personal barriers (lack of confidence in |

STEPS 6-7:
Synthesis and
analysis

from the information collected mostly using interviews and surveys/ questionnaires (Braun & Clarke, 2006). Major reoccurring themes in the findings were synthesized to provide an in-depth understanding of Indigenous people and other key stakeholders' perspectives of using digital technology to support Indigenous mental health.

## 3. Results

### 3.1. Overview of the studies

#### 3.1.1. Participant identities and countries of residence
The 27 studies reviewed were conducted in four countries: Australia,

#### 3.1.3. Types of research and instruments employed
Six studies used quantitative methods. Three are Australian studies that reported on measurable outcomes of an eMH app, online mental health service, or eMH app training for service providers using well-established scales or researcher-developed questionnaires (Dingwall et al., 2015a; Tighe et al., 2017; Titov et al., 2019). The other three studies used a questionnaire or survey to investigate (a) Indigenous people's use of digital technologies, preferred mental health content for a webpage design, and technology-based health information-seeking patterns (Rushing & Stephens, 2011; Sabato, 2019), and (b) mental health service providers' attitudes, perceptions, and intention of using
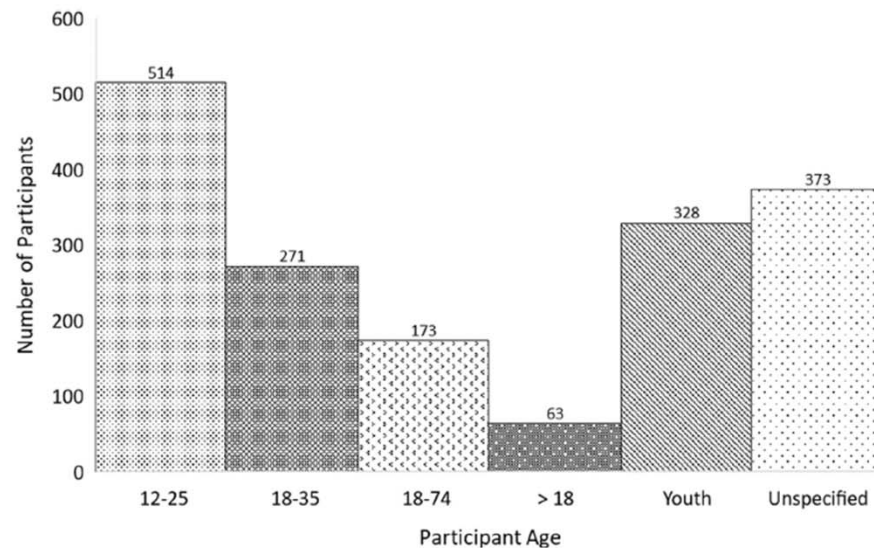


Fig. 3. Age distribution of participants in reviewed studies ($n = 21$).
Notes: Participants in Toombs et al.'s (2020) study using administrative data ($n = 23$, 235), and individuals and organizations ($n = 423$) who tweeted and retweeted in Sweet et al.'s (2015) study are excluded from this figure due to the large numbers of participants. Four studies (Carlson et al., 2015, 2017; Carlson & Frazer, 2015; Stewart et al., 2008) not reporting the number of participants were excluded.
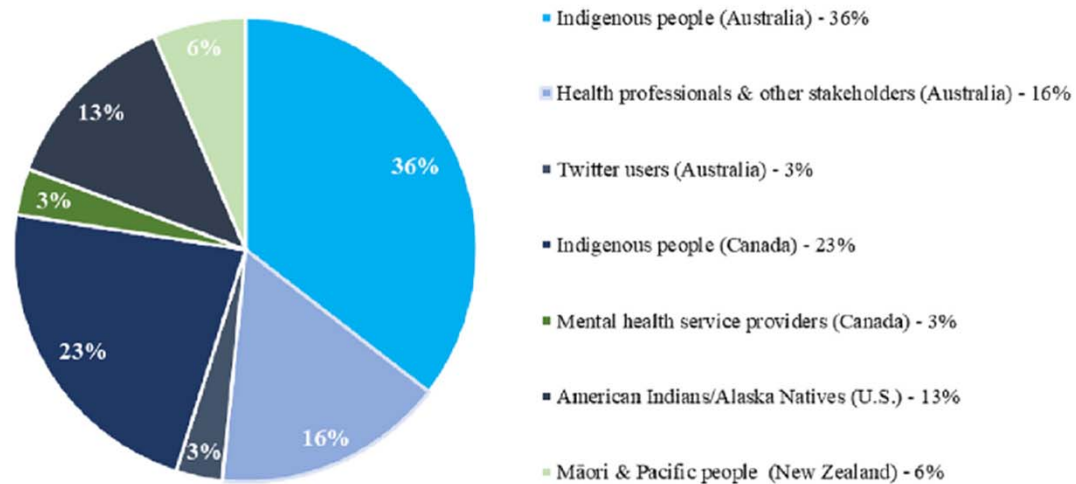
**Fig. 2.** Geographic distribution of the number of studies with Indigenous participant identities ($n = 27$).

Notes: 1. "Indigenous people (Australia)" includes Aboriginal and Torres Strait Islanders, and "Indigenous people (Canada)" includes participants identified as Aboriginal and First Nations. 2. Bennett-Levy et al.'s (2017) study is recorded twice, as 21 of the 26 health professional participants were Aboriginal & Torres Strait Islanders (Australia); Bird et al.'s (2017) study is recorded twice, as 15 of the 16 service providers were Aboriginal & Torres Strait Islanders (Australia); Dingwall et al.'s (2015a) study is recorded twice, as 35% of the 138 service providers were Aboriginal & Torres Strait Islanders (Australia); Dingwall et al.'s (2015b) study is recorded twice, as four of the 15 service providers were Aboriginal & Torres Strait Islanders (Australia). 3. "Twitter Users" include Sweet et al.'s (2015) participants: a total of 423 Twitter users (who tweeted and retweeted), consisting of 346 individuals and 108 organizations, that participated in a day-long event "for Aboriginal and Torres Strait Islanders to speak, and for non-Indigenous Australians to participate by listening or re-tweeting" (p. 3).

# Knowledge syntheses: Systematic & Scoping Reviews, and other review types

## Definition

A meta-analysis is defined by Haidlich (2010) as "a quantitative, formal, epidemiological study design used to **systematically assess previous research studies to derive conclusions** about that body of research. Outcomes from a meta-analysis may include a **more precise estimate of the effect of treatment or risk factor for disease, or other outcomes**, than any individual study contributing to the pooled analysis" (p. 29).

According to Grant & Booth (2009), a meta-analysis is defined as a "technique that statistically combines the results of quantitative studies to provide a more precise effect of the results" (p. 94).

## When is conducting a meta-analysis appropriate?

**When to Use It:** According to the Cochrane Handbook, "an important step in a systematic review is the thoughtful consideration of whether it is appropriate to combine the numerical results of all, or perhaps some, of the studies. Such a **meta-analysis** yields an overall statistic (together with its confidence interval) that summarizes the effectiveness of an experimental intervention compared with a comparator intervention" (section 10.2).

Conducting meta-analyses can have the following benefits, according to Deeks et al. (2019, section 10.2):

- *To improve precision.* Many studies are too small to provide convincing evidence about intervention effects in isolation. Estimation is usually improved when it is based on more information.

- *To answer questions not posed by the individual studies.* Primary studies often involve a specific type of participant and explicitly defined interventions. A selection of studies in which these characteristics differ can allow investigation of the consistency of effect across a wider range of populations and interventions. It may also, if

https://guides.library.utoronto.ca/c.php?g=713309&p=5084626
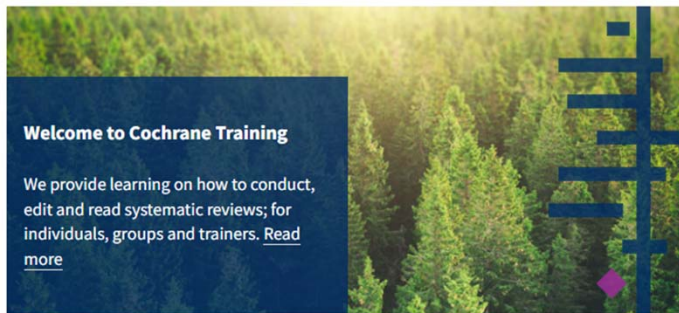
Potential advantages of meta-analyses include an improvement in precision, the ability to answer questions not posed by individual studies, and the opportunity to settle controversies arising from conflicting claims. However, they also have the potential to mislead seriously, particularly if specific study designs, within-study biases, variation across studies, and reporting biases are not carefully considered.

Most meta-analysis methods are variations on a weighted average of the effect estimates from the different studies.

Variation across studies (heterogeneity) must be considered, although most Cochrane Reviews do not have enough studies to allow for the reliable investigation of its causes. Random-effects meta-analyses allow for heterogeneity by assuming that underlying effects follow a normal distribution, but they must be interpreted carefully. Prediction intervals from random-effects meta-analyses are a useful device for presenting the extent of between-study variation.

# Methods: Qualitative synthesis and systematic reviews
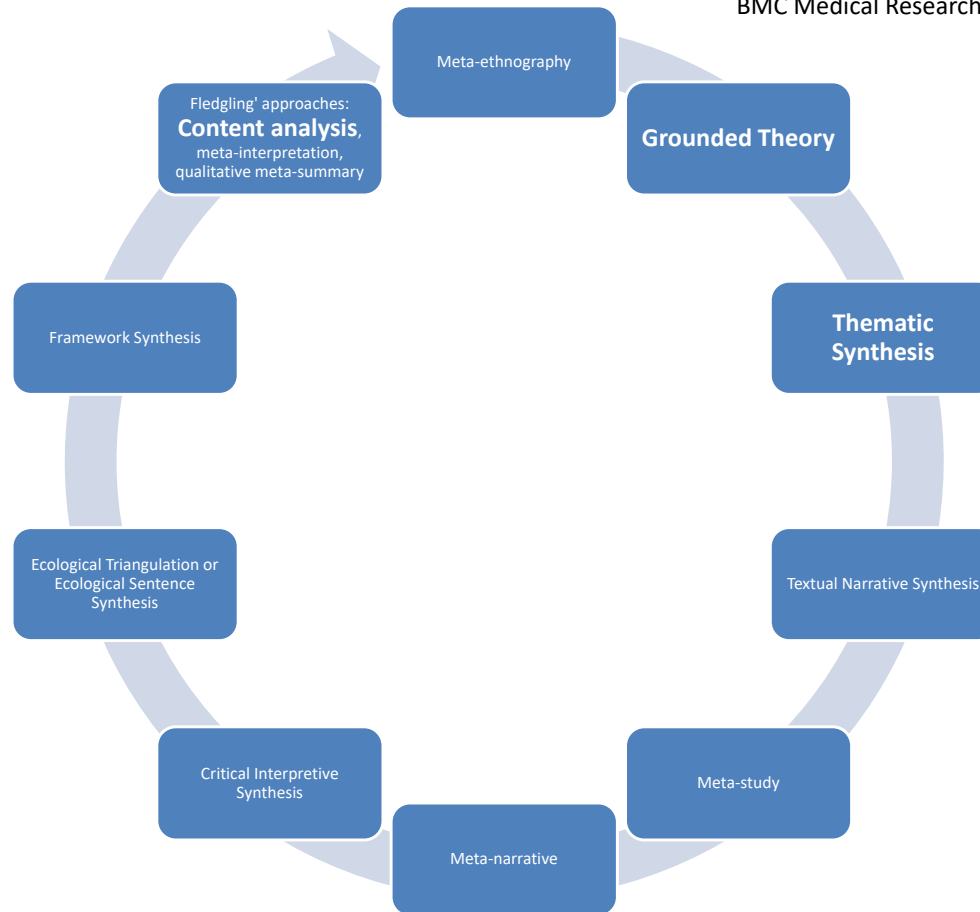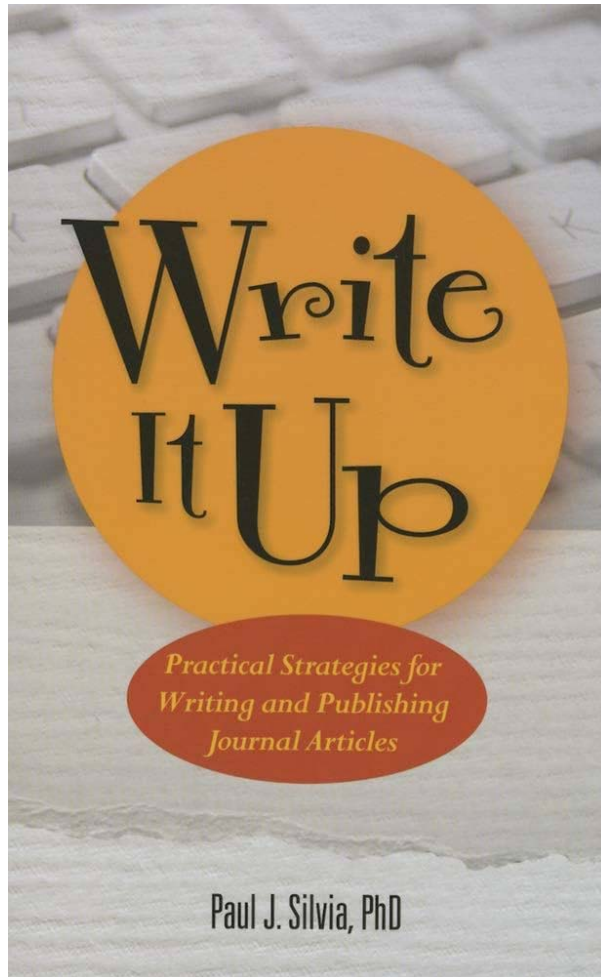
STEP 7

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TALL LAB