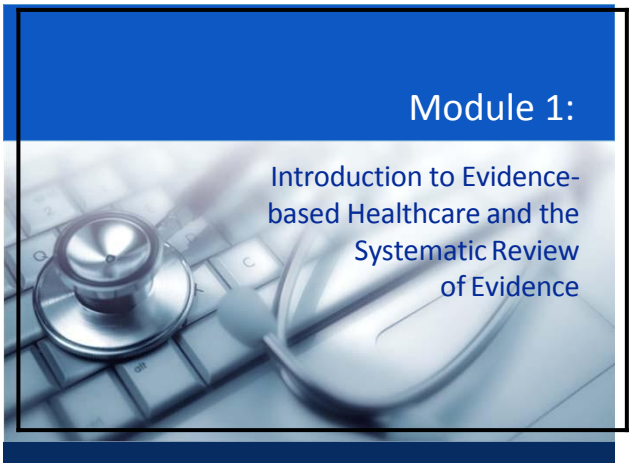


Training Program Purpose

> Designed to prepare researchers, clinicians, academics and policy makers to develop, conduct and report systematic reviews

The History of Systematic Reviews

- Archie Cochrane (1909-1988)
- Widely known for writing '*Effectiveness and Efficiency: Random Reflections on Health Services*' in 1972

"It is surely a great criticism of our profession that we have not organised a critical summary, by specialty or subspecialty, adapted periodically, of all relevant randomised controlled trials." (Cochrane, 1979)

The History of Systematic Reviews

- 'Systematic reviews and meta-analyses' began to appear in the 1970s and 1980s in a variety of health fields
- Confusion between 'systematic reviews' and 'meta-analyses'
- Chalmers and Altman (1995) suggested that the term 'meta-analysis' be restricted to the process of statistical synthesis
- Growing interest in systematic reviews led to the emergence of international, interdisciplinary groups promoting/expanding systematic reviews
- Methodology is continually evolving

The History of Evidence-Based Healthcare

- Prof David Sackett (1934-2015)
- Widely known for writing '*Clinical Epidemiology*' and '*Evidence-Based Medicine*'

"The conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient. It means integrating individual clinical expertise with the best available external clinical evidence from systematic research." (Sackett et al, 1996 p.72)

EBHC Evolving

- Prof Alan Pearson AM
- *'The Clinical Nursing Unit'*
- Shift from traditional RCT evidence to answer questions of effects to evidence to answer questions of appropriateness, meaningfulness and feasibility in addition to effectiveness
- 'Best-available' evidence

"Evidence-based practice is not exclusively about effectiveness; it is about basing practice on the best available evidence... the diverse origins of problems in health care require ...the utilisation of a diverse range of research methodologies to generate appropriate evidence." *(Pearson, 2004 p. 48)*

Terminology

- Evidence-based medicine
  - inception
  - As EBHC, but specific to medical practice
- Evidence-based Nursing
- Evidence-based Policy Making
- Evidence-based….
- Evidence-informed….
- ***Evidence-based healthcare***

EBHC incorporates all health professions!

Evidence-Based Healthcare

'Decision-making that considers the feasibility, appropriateness, meaningfulness and effectiveness of healthcare practices. The best available evidence, the context in which care is delivered, the individual patient and the professional judgement and expertise of the health professional inform this process.'

(Jordan et al, 2016)

Why do we need EBHC?

> Practice varies considerably, many times unjustifiably so

> Spiralling costs of healthcare in the developed and developing world

> Patients are not being given treatments based on the best available evidence

- Up to 43% of patients do not receive the recommended care (Runciman et al, 2012)
- 30% receive care that is unnecessary/potentially harmful (Schuster et al, 1998)
- Compliance varies from approximately 11-82% (Buchan 2004)

How do we define evidence?

> "The basis of belief; the substantiation or confirmation that is needed in order for us to believe that something is true" (Pearson et al, 2005 p. 86)

> It may include:

- Research studies
- Experience/ expertise
- Discourse

JBI FAME Scale

> Health professionals require evidence to substantiate a wide range of activities and interventions.

> **When making clinical decisions, health professionals are concerned with whether their approach is Feasible, Appropriate, Meaningful and Effective. (FAME)**

Feasibility

Feasibility is the extent to which an activity is practical and practicable. Clinical feasibility is about whether or not an activity or intervention is physically, culturally or financially practical or possible within a given context.

(Pearson et al, 2005)

Appropriateness

Appropriateness is the extent to which an intervention or activity fits with or is apt in a situation. Clinical appropriateness is about how an activity or intervention relates to the cultural or ethical context in which care is given.

(Pearson et al, 2005)

Meaningfulness

Meaningfulness refers to the meanings patients associate with an intervention or activity as a result of their experience of it. Meaningfulness relates to the personal experience, opinions, values, thoughts, beliefs, and interpretations of patients or clients.

(Pearson et al, 2005)

Effectiveness (Effects)

Effectiveness is the extent to which an intervention, when used appropriately, achieves the intended effect. Clinical effectiveness is about the relationship between an intervention and clinical or health outcomes.

(Pearson et al, 2005)

The JBI Model of Evidence-Based Healthcare

The JBI Model of Evidence-Based Healthcare

The JBI Model of Evidence-Based Healthcare

The JBI Model of Evidence-Based Healthcare

The JBI Model of Evidence-Based Healthcare

The JBI Model of Evidence-Based Healthcare

The JBI Model of Evidence-Based Healthcare

The JBI Model of Evidence-Based Healthcare

Translational Science

> A process arising from a need, specifically, the need to move research findings into policy and practice (Pearson et al, 2011 p. 67)

> Language and steps in the cycle vary but essentially its focus is on the delivery system, arising from a pragmatic need to transfer high quality evidence about specific outcomes across complex environments

Knowledge Translation

> The collection and identification of unmet knowledge needs from key stakeholders [Gap 1]

> The process from basic discovery (basic/laboratory science) to intervention development (clinical trials) [Gap 2] development (proven interventions) to delivery (used in practice) [Gap 3]

> Essentially the 'movement' of research to address these gaps

Session 3:

Introduction to Systematic Reviews

Systematic Review

> Systematic reviews aim to provide a *comprehensive, unbiased* synthesis of many relevant studies in a single document using rigorous and transparent methods. A systematic review does not seek to create new knowledge but rather to synthesize and summarize existing knowledge

(Aromataris & Pearson, 2014)

Systematic Review

> Quality depends on the methods used to minimize the risk of error and bias

> Explicit and exhaustive reporting of methods is necessary

> Such rigor distinguishes them from traditional literature reviews

> As a scientific enterprise, a systematic review will influence healthcare decisions and should be conducted with the same rigor expected of all research

Why do a Systematic Review?

> The aims of a systematic review may be to:

1. uncover the international evidence
2. confirm current practice/ address any variation
3. identify areas for future research
4. investigate conflicting results
5. produce statements to guide decision-making

Literature Review vs Systematic Review

Literature Review ✗

- Choices made for inclusion of studies can be subjective
- Conducted according to no stated methodology
- Leads to risk of bias/systematic error
- Limited searching
- Unreproducible and not transparent

Systematic Review ✓

- Informed by an a priori protocol
- Structured research process
- Steps are taken to reduce bias
- Systematic and often exhaustive searching for information
- Transparent and reproducible methods

Systematic Review Standards

- Quality depends on the extent to which methods are followed to minimize risk of error and bias
- SRs require explicit and exhaustive reporting of methods
- Reporting standards exist to guide review reports
  - **PRISMA** (Preferred Reporting Items for Systematic Reviews and Meta-Analyses)
  - **ENTREQ** (Enhancing transparency in reporting the synthesis of qualitative research)
  - **JBI Reviewer's Manual** and **JBISRIR** Author guidelines
  - **Cochrane Handbook** and **MECIR** (Methodological Expectations of Cochrane Intervention Reviews)

Systematic Review Standards

Standards provide guidance on:

- Initiating a systematic review
- Finding and assessing individual studies
- Synthesizing the body of evidence
- Reporting systematic reviews
- *Mainly focus on quantitative reviews*

Characteristics of a high quality SR

- Clearly articulated objectives and questions
- Inclusion and exclusion criteria, stipulated a priori (in the protocol)
- Comprehensive search to identify all relevant studies (published and unpublished)
- Critical appraisal of the included studies
- Analysis of data extracted from the included research
- Presentation and synthesis of the findings extracted
- Transparent reporting of the methodology and methods used to conduct the review

(Aromataris & Pearson, 2014)

Activity 1

Example Reviews

- Scan over the two reviews provided in your workbook

- Group discussion:
  - are both examples of a systematic review?
  - are they of good quality?

Steps in a Systematic Review

- Formulate review question
- Define inclusion and exclusion criteria
- Locate studies (searching)
- Select studies
- Assess study quality
- Extract data
- Analysis/summary and synthesis of relevant studies
- Present results
- Interpret results/establish confidence in body of evidence (GRADE, ConQual)

(Aromataris & Pearson, 2014)

Planning a Systematic Review

- Consider human and technical resources
- A review requires at least 2 reviewers; 1 (at least) with appropriate training
- Consider expertise of topic and expertise of review process
- Library support (database access, searching expertise)
- Statistician support
- Methodologist support

Planning a Systematic Review

- Preliminary investigation of literature required to determine if papers are available on topic of interest
- Have there been any reviews already conducted on your topic of interest? If so how are they different?
- Will depend on your topic but consider Cochrane database, PubMed, PROSPERO
- Duplicate reviews need to be justified

Planning a Systematic Review

- Reviews cannot be done by one person!
- Review lead
  - initiates & leads the review, allocates other reviewers
- Associate reviewer/s
  - contribute to intellectual progress & direction of the review; provide content or process expertise; mediate disagreements between primary and secondary
  - assists review lead in conducting review, critically appraises papers, data extraction

Planning a Systematic Review

> Review panel recommended
> Consist of experts in: review methods, content area and a lay consumer representative
> Representation will depend on topic and scope of review
> Meet throughout process of review (prior to protocol submission, prior to report submission)

Registering a Title

> Reviewers are encouraged to register their review title
> Enables reviewers to identify topics currently in development and avoids potential duplication
> Not compulsory across all organizations
> Time restriction until protocol developed

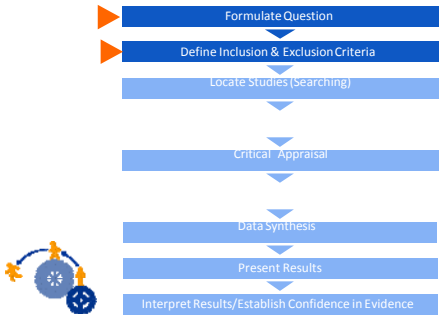
Systematic Review Protocol

> Essential to a systematic review is the development of a protocol
> A protocol pre-defines the objectives and methods of the systematic review
> Allows transparency, reduces reporting bias
> Must be done prior to conducting the systematic review
> Separate document to the systematic review report

Session 4:

Overview of Systematic Reviews
Types and Questions

Overview of Systematic Reviews
Types and Questions



Types of Systematic Reviews

> Traditionally, focused on systematic reviews of randomized controlled trials of therapeutic interventions

> Shift to consider other types of evidence (e.g. qualitative evidence)

> Methodologies/methods constantly evolving

> JBI has developed methodologies/methods for 10 types of systematic reviews

Types of Systematic Reviews

1. Effectiveness Reviews
2. Qualitative Reviews
3. Costs/Economics Reviews
4. Prevalence or Incidence Reviews
5. Diagnostic Test Accuracy Reviews
6. Etiology and Risk Reviews
7. Textual Synthesis Reviews
8. Mixed Methods Reviews
9. Umbrella Reviews
10. Scoping Reviews

Types of Systematic Reviews

> Requires a systematic review process sensitive to the various types of evidence used in various reviews

> This training program only focuses on the ten types of reviews outlined

Question Development

> The universal first step in the systematic review process

> A good question assists readers to identify whether a paper should be read or not

> Forms the basis for inclusion and exclusion criteria

Question Development

> A good question supports the review, a poor question risks confounding the review
> A good question responds to identified priorities and needs
> Consider:
  – issues of high cost
  – high frequency
  – poor outcomes
  – wide variation in practice not explained by evidence
  – Whether studies/papers exist on the topic

Question Development

> Verify that the question has not already been addressed (i.e. search protocols and systematic review reports in the JBI and Cochrane Databases and others)
> If a review exists on the topic, examine whether a new systematic review is justified

Question Development

> A variety of mnemonics exist to help reviewers structure the review question:
  – PICO most common for effectiveness reviews
  – PICo for qualitative reviews
  – CoCoPop for prevalence and incidence reviews
  – PIRD for diagnostic test accuracy reviews
  – PEO for etiology and risk reviews
  – PCC for scoping reviews

Effectiveness Reviews

> Effectiveness studies: Aim to establish a causal relationship between two variables by deliberately manipulating one of them and looking at changes in the other (experimental studies)

> Effectiveness is the extent to which an intervention, when used appropriately, achieves the intended effect

> Effectiveness reviews synthesise primary studies to establish the effect of treatment

Effectiveness Reviews

Question Development:

PICO

- –Population
- –Intervention
- –Comparator/control
- –Outcome

Effectiveness Reviews

> Population

- –The most important characteristics, including:
  - demographic factors of the population (e.g. age, gender, ethnicity)
  - socioeconomic factors (e.g. education, occupation)
  - the setting (e.g. hospital, community etc.)

Effectiveness Reviews

> Intervention and Comparator
- Primary intervention of interest (experimental treatment group)
- Comparator (control group)
  - Passive (placebo, no treatment, standard care, or a waiting list control)
  - Active (variation of the intervention, a drug, or kind of therapy)
- Consider dosage/intensity, mode of delivery, frequency/duration/timing of delivery

Effectiveness Reviews

> Outcomes
- Identify the primary outcome/s in order to reach a clinically relevant conclusion
- Secondary outcomes may be required
- Outcomes should be stated neutrally, covering benefits and adverse effects
- Avoid use of surrogate outcomes unless clearly reasoned in the background
- Consider how the type and timing of outcome measurements impacts on outcome measurement

Effectiveness Reviews

Example:

> Are non-pharmacological interventions compared with control interventions (e.g. usual care) effective in reducing depressive symptoms of older adults with depressive disorders?

Population Intervention Comparison Outcome

Effectiveness Reviews

Example:

> Are **non-pharmacological interventions** compared with **control interventions (e.g. usual care)** effective in reducing **depressive symptoms** of **older adults** with **depressive disorders**?

Population | Intervention | Comparison | Outcome

Qualitative Reviews

> Focus on analysing human experiences and cultural and social phenomena

> Important to:

- exploring and explaining why interventions are or are not effective from a person-centered perspective
- able to explain and explore why an intervention is not adopted in spite of evidence of its effectiveness (or, conversely, why certain practices are ingrained despite them not being effective)
- Provide information on the patient's experience, enabling the health professional to better understand and interact with patients

Qualitative Reviews

Question Development

PICo

- –Population
- –Phenomena of Interest
- –Context

Qualitative Reviews

> Population does not imply aspects pertinent to quantitative reviews (e.g. sampling methods, homogeneity); may be exposure to a disease, intervention or interaction

> The phenomena of interest relates to a defined event, activity, experience or process

> Context is the setting or distinct characteristics

Qualitative Reviews

Example:

> What is the experience of recovering from burns injuries in adult (over 18 years of age) patients during their stay in a hospital burns care unit?

Population | Phenomena of Interest | Context

Qualitative Reviews

Example:

> What is the **experience of recovering from burns injuries** in **adult (over 18 years of age) patients** during their stay in a **hospital burns care unit**?

Population | Phenomena of Interest | Context

Costs/Economics Reviews

> Reviews assessing the costs of a certain intervention, process, or procedure

> Useful to inform health policy decisions attempting to achieve equality in healthcare provision to all members of society and are commonly used to justify the existence and development of health services, new health technologies and also, clinical guideline development

Costs/Economics Reviews

Question Development

PICO

- Population
- Intervention
- Comparator
- Outcome

Context also considered

Costs/Economics Reviews

Example:

> What is the cost effectiveness of Mohs micrographic surgery compared to other surgical/ablative interventions for non-melanoma skin cancer in developed countries?

Population | Intervention | Comparison | Outcome | Context

Costs/Economics Reviews

Example:

> What is the **cost effectiveness** of **Mohs micrographic surgery** compared to **other surgical/ablative interventions** for **non-melanoma skin cancer** in **developed countries**?

Population | Intervention | Comparison | Outcome | Context

Prevalence or Incidence Reviews

> Measure frequency of disease and enable governments, policy makers, health professionals and the general population to inform the development and delivery of health services and evaluate changes and trends in diseases over time

> Important in the description of geographical distribution of a variable and the variation between subgroups (such as gender or socioeconomic status), and for informing health care planning and resource allocation

> Prevalence (the proportion of a population who have a certain disease) vs incidence (how often a disease occurs)

Prevalence or Incidence Reviews

Question Development

CoCoPop

- –Condition
- –Context
- –Population

Prevalence or Incidence Reviews

> The variable of interest is the condition and can be a health condition, disease, symptom, event or factor
> Define context or specific setting since prevalence/incidence can be impacted by environmental factors
> Like PICO, population characteristics need to be described in detail

Prevalence or Incidence Reviews

> What is the prevalence and incidence of peri-natal depression among women in Australia?

Condition Context Population

Prevalence or Incidence Reviews

> What is the prevalence and incidence of **peri-natal depression** among **women** in **Australia**?

Condition Context Population

Diagnostic Test Accuracy Reviews

- Diagnostic tests are used by clinicians to identify the presence/absence of a condition in a patient for the purpose of developing an appropriate treatment plan. Often there are several tests available for diagnosis
- Systematic reviews assessing diagnostic test accuracy provide a summary of test performance and are important for clinicians and other healthcare practitioners in order to determine the accuracy of the diagnostic tests they use or are considering using

Diagnostic Test Accuracy Reviews

Question Development

PIRD

- **P**opulation
- **I**ndex test
- **R**eference test
- **D**iagnosis of interest

Diagnostic Test Accuracy Reviews

> The population includes all participants who will undergo the diagnostic test

> Index test refers to the diagnostic test whose accuracy is being investigated; multiple iterations may exist

> Reference test refers to the gold standard test which the index test will be compared with

> Diagnosis of interest relates to what diagnosis is being investigated; may be a disease, injury, disability or pathological condition

Diagnostic Test Accuracy Reviews

Example:

> What is the diagnostic accuracy of currently available laboratory tests for swine flu (H1N1) compared to viral culture as a reference test amongst people presenting with suspected flu?

Population | Index Test | Reference Test | Diagnosis of interest

Diagnostic Test Accuracy Reviews

Example:

> What is the diagnostic accuracy of currently available **laboratory tests** for **swine flu (H1N1)** compared to **viral culture** as a reference test amongst **people presenting with suspected flu**?

Population | Index Test | Reference Test | Diagnosis of interest

Etiology and Risk Reviews

> Assess associations between various variables/epidemiological factors and the outcomes e.g. Who is getting the disease? Where is the disease occurring? What factors are associated with the disease?

> Important in informing health care planning and resource allocation, and are particularly valuable for governments when making decisions regarding health policy

> Not able to determine causality; rather they are only able to infer correlations or relationships between variables

Etiology and Risk Reviews

Question Development

PEO

- –Population
- –Exposure of interest
- –Outcome or response

Etiology and Risk Reviews

> Consider outcomes relevant to the health issue and important to key stakeholders

> Population characteristics similar to other mnemonics

> The exposure of interest refers to a particular risk factor or several factors associated with a disease/condition of interest in a population/group/cohort who have been exposed to them

Etiology and Risk Reviews

Example:

> Are children exposed to tobacco smoke (maternal smoking) during pregnancy at risk for obesity in childhood?

Population Exposure Outcome

Etiology and Risk Reviews

Example:

> Are **children** exposed to **tobacco smoke (maternal smoking) during pregnancy** at risk for **obesity in childhood**?

Population Exposure Outcome

Textual Synthesis Reviews

> Reviews assessing text and opinion/policy

> Expert opinion can be used to either complement empirical evidence or, in the absence of research studies, stand alone as the best available evidence

> Can provide practical guidance to practitioners and policy makers

Textual Synthesis Reviews

Question Development:

Broadly PICo is used

- Population
- Intervention/Phenomena of Interest
- Context

HOWEVER not all elements necessarily apply to every text or opinion-based review, and use of mnemonics should be considered a guide rather than a policy

Textual Synthesis Reviews

Example:

> What are the policy strategies to reduce maternal mortality in pregnant and birthing women in Cambodia, Thailand, Malaysia and Sri Lanka?

Population | Phenomena of Interest | Context

Textual Synthesis Reviews

Example:

> What are the **policy strategies to reduce maternal mortality** in **pregnant and birthing women** in **Cambodia, Thailand, Malaysia and Sri Lanka**?

Population | Phenomena of Interest | Context

Mixed Methods Reviews

> Reviews that contain evidence from different types of research
> Have the potential to produce systematic reviews of direct relevance to policy makers and practitioners as opposed to single method reviews which can be seen as too narrow
> JBI methodology for mixed methods reviews bring together the results of single method reviews (including quantitative, qualitative, etc.) on a given topic

Mixed Methods Reviews

Question Development:

> PICO and/or PICo and/or PIRD and/or CoCoPop and/or PEO

Mixed Methods Reviews

Example:

> What is the current best evidence of the effectiveness and meaningfulness of self-monitoring of blood glucose (SMBG) compared to standard care in people with type 2 diabetes who are not treated with insulin?

Population | Intervention | Comparator | Outcome | Context

Mixed Methods Reviews

Example:

> What is the current best evidence of the effectiveness and meaningfulness of self-monitoring of blood glucose (SMBG) compared to standard care in people with type 2 diabetes who are not treated with insulin?

Population | Intervention | Comparator | Outcome | Context

Umbrella Reviews

> Able to address a broad scope of issues related to a topic of interest and can highlight if the evidence base around a topic or question is consistent, contradictory or if discrepant findings exist

> Overview of existing systematic reviews

> Compare and contrast published reviews and provide an overall examination of a body of information that is available for a given topic

Umbrella Reviews

Question Development:

> PICO and/or PICo and/or PIRD and/or CoCoPop and/or PEO

Umbrella Reviews

Example:

> What are effective non-pharmacological interventions to manage aggressive behavior in elderly patients with dementia?

(Looking exclusively at systematic reviews)

Population | Intervention / Phenomena | Comparator / Context | Outcome

Umbrella Reviews

Example:

> What are effective non-pharmacological interventions to manage aggressive behavior in elderly patients with dementia?

(Looking exclusively at systematic reviews)

Scoping Reviews

- Reviews that determine the size/scope of a body of literature on a topic
- Used to map the key concepts underpinning a research area, clarify working definitions and/or the conceptual boundaries of a topic, and identify gaps in the knowledge base
- Useful for examining emerging evidence when it is still unclear what other, more specific questions can be posed and valuably addressed
- Can inform future systematic reviews

Scoping Reviews

Question Development:

PCC

- Population
- Concept
- Context

HOWEVER not all elements necessarily apply to every scoping review, and use of mnemonics should be considered a guide rather than a policy

Scoping Reviews

- The population should detail important characteristics and any exclusion criteria
- The core concept should be clearly articulated to guide scope and breadth; this may include elements detailed in a 'standard review' as well as outcomes
- Context may refer to cultural factors and specific setting details

Scoping Reviews

Example:

- What types of neurological reactions to the Human Papilloma Virus (HPV) vaccination have been reported in people who have received the HPV vaccine?

Population Concept Context

Scoping Reviews

Example:

- What types of **neurological reactions** to the Human Papilloma (HPV) Virus vaccination have been reported in **people who have received the HPV vaccine**?

Population Concept Context

Scoping reviews

Example 2

> What theories or frameworks have been used to inform the implementation or translation of evidence into practice in healthcare settings?

Context

Scoping reviews

Example 2

> What **theories or frameworks have been used to inform the implementation or translation of evidence into practice** in **healthcare settings**?

Context

Question Development

Review Type	Mnemonic
Effectiveness	PICO
Qualitative	PICo
Costs/Economics	PICO
Prevalence or Incidence	CoCoPop
Diagnostic Test Accuracy	PIRD
Etiology and Risk	PEO
Textual Synthesis	PICo
Mixed Methods	PICO or PICo or PIRD or CoCoPop or PEO or multiple
Umbrella	PICO or PICo or PIRD or CoCoPop or PEO or multiple
Scoping	PCC

Question Development

> Constructing a well-built clinical question is a fundamental skill
> Use the appropriate mnemonic to guide you
> Most questions can be systematically reviewed
> The question operationalizes the review by forming the basis for inclusion and exclusion criteria

Inclusion Criteria

> Step 2: define inclusion and exclusion criteria
> Determines which research articles will be selected
> Allows the reader to understand the focus of the review
> Clarity of inclusion criteria ensures replicability of the review

Inclusion Criteria

Consider:

> Participants/population characteristics
> Intervention, interest, exposure or phenomenon under investigation
> Comparators
> Outcomes
> Context
> Condition
> Types of studies to be included
> Publication language
> Time period

Activity 2

Question and Inclusion Criteria Development

> Using the appropriate mnemonic develop and design a systematic review question and subsequent inclusion/exclusion criteria

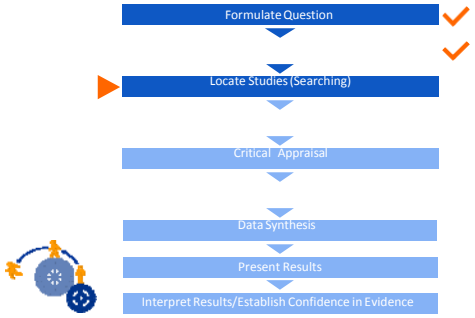
> Each participant will report back and present and discuss their question with the class

Question Development

Review Type	Mnemonic
Effectiveness	PICO
Qualitative	PICo
Costs/Economics	PICO
Prevalence or Incidence	CoCoPop
Diagnostic Test Accuracy	PIRD
Etiology and Risk	PEO
Textual Synthesis	PICo
Mixed Methods	PICO or PICo or PIRD or CoCoPop or PEO or multiple
Umbrella	PICO or PICo or PIRD or CoCoPop or PEO or multiple
Scoping	PCC

Searching for Studies

Developing a search strategy



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Searching

- A key characteristic of systematic reviews is a comprehensive search
- A key component in any definition of a systematic review is the attempt to local ALL published and unpublished evidence relevant to a review question
- General approach to conducting a comprehensive search involves:
  - identifying appropriate resources and sources to search
  - developing search strategies
  - searching bibliographic databases
  - looking for unpublished literature
  - handsearching
  - reference list searching

- Search must be accurately documented and reproducible

Searching

- First step following protocol development
- Complete identification of published and unpublished data
- Iterative process
- Where possible should be undertaken with information scientist/librarian

Search Strategy

Features of an effective search strategy:

> Sensitivity – ability to identify all the relevant studies

> Specificity – ability to exclude irrelevant studies, also known as precision. Inverse relationship between sensitivity and specificity

> Minimize bias – think about finding/including studies that are not in major databases

> Efficient – look in the place you expect to have highest yield

Search Strategy Steps

> Phase one (initial search) :

- Initial search of PubMed, CINAHL, followed by analysis of text words in the title and abstract and index terms used

> Phase two (second search):

- Apply identified keywords and index terms across all databases and grey literature sources

> Phase three (third search):

- Review reference lists of all studies retrieved for critical appraisal

Search Strategy Basics

> Keyword/free-text word

> Index terms/subject headings/controlled vocabularies

> A comprehensive search strategy should consist of BOTH keywords/free-text words AND index terms

Search Strategy Basics

> Initial terms and keywords
  – Document keywords, concepts, colloquial terms, relationship words
  – Break up the search question
  – Accurately describe initial studies relevant to your review
> Adding new terms
  – Pilot them and see whether you get relevant material

Search Strategy Basics

Subject Headings

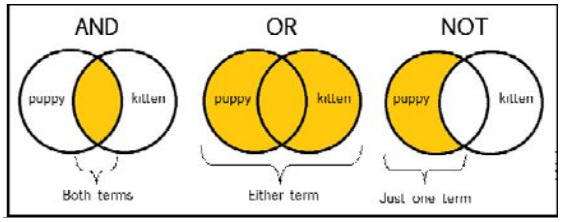
> Categorization of information is important to control data, provide commonality, consistency and decrease spelling and cultural differences
> MEDLINE, EMBASE, CINAHL and other databases have standardized subject terms as a controlled vocabulary or thesaurus
> MEDLINE, EMBASE, CINAHL and other databases have different approaches to indexing and different words/language

Search Strategy Basics

Wildcards

> Allow for English and American spellings. Use a wildcard character, in most databases this is a '?' (i.e. Colo?r results = colour or color or randomi?ed results = randomized or randomised)
> Other wildcards like '$' are unlimited for example: organi$ = organising or organizing or organised or organisation
> Variable number of characters: limit the truncation dog$2 will find dogma (i.e. two letters after dog)
> Boolean operators (AND/OR/NOT) are important for bringing key concepts together

Boolean Operators



Search Strategy Basics

Limits

> Date

– No point in searching beyond certain periods for some new drugs or surgeries

> Other

– Study design

– Population

Concept Map

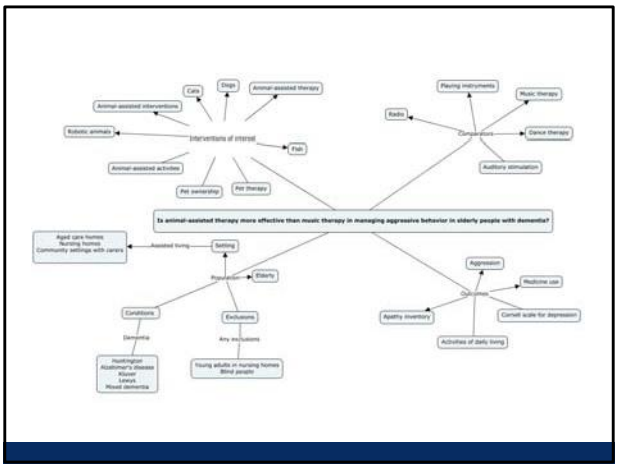
> Developing a concept map helps to develop a comprehensive search strategy and provides you with a visual image of your research topic

> Contains:

– main topic idea in the center of the map with other aspects of your topic surrounding it (keywords)

– Alternative terminology (keywords) to describe your topic for each keyword

– Illustrates relationships of the various aspects of your topic to each other



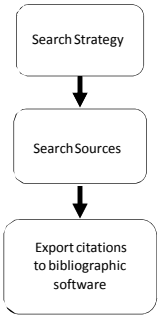
Logic Grid

> Another visual aid to assist in developing your search

> Consist of columns representing discrete concept aligned with each element of the relevant mnemonic (e.g. PICO)

Population	Intervention	Comparison intervention	Outcome measures
Dementia Alzheimer Huntington Kluver Lewy	Animal-assisted therapy Animal-assisted activities Animal-assisted interventions Animal therapy Pet therapy Dog therapy Dog-assisted therapy Canine-assisted therapy Pet-facilitated therapy Aquarium	Music therapy Music Singing Sing Auditory stimulation	Aggression Neuropsychiatric Apathy inventory Cornell scale Cohen Mansfield BEHAVE-AD CERAD-BRSD Behavior Behaviour

Search Logistics



> Apply Search Strategy to databases

> Export to bibliographic software

> Document process

Documenting your Search

> Important to keep an accurate record of the search and how it was performed

- Numbers of titles identified by search are reported in review report
- Avoids having to repeat searches
- Allows readers to duplicate the search strategy
- Use reference management software to document

Documenting your Search

> A review should:

- Consider both published and unpublished studies/papers
- Specify the timeframe chosen for the search and any language restrictions
- Specify the databases to be searched and including the platform used to search a particular database
- list the initial keywords to be used

> This should all be documented in your protocol

Documenting your Search

> The full review report details how the reviewers searched for relevant papers (in the search strategy section)

> It should include at least one detailed search strategy of one of the major databases in the appendix

> Like the protocol the review should justify any restrictions (timeframe and language)

> The databases searched (with search dates) should be listed

Activity 4

Logic Grid Development

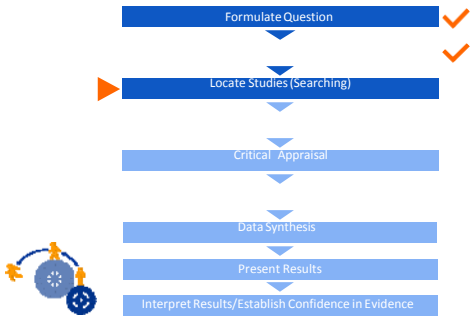
> Develop a logic grid for your review question

> Report back

Session 7:

Searching for Studies
Types of Resources

Searching for the Evidence



Types of Resources

> Peer reviewed journal articles (via scientific databases, libraries, the journals themselves)

> Grey Literature

- Research and Trials Registers
- Theses/Dissertations
- Organizations/websites
- Data – Statistics
- Circulars
- Reports

> Experts

Computer Bibliographic Databases

> Consider platform vs database
- OVID or EBSCOHost for MEDLINE?

> What is the focus of the database?
- Search those relevant to your question

> Know the language of the database
- How is it indexed?
- Do I use .ae or /ae for adverse events?
- Use limits - are these to be assigned before or after the search?

Computer Bibliographic Databases

> The JBI Database
> The Cochrane Database
> MEDLINE
> EMBASE
> CINAHL

Other databases…

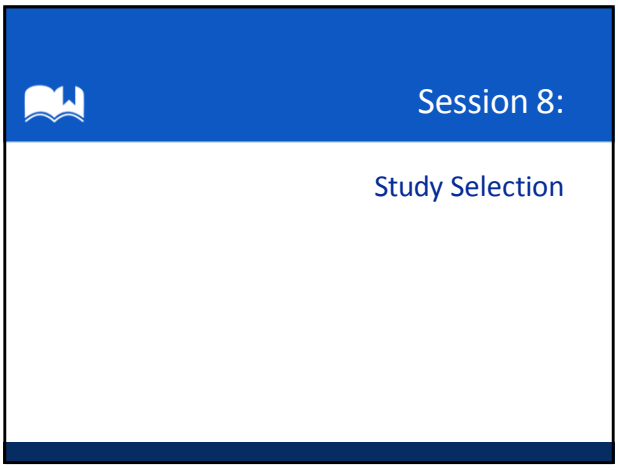
> PsycInfo
> Scopus
> OTseeker
> PEDro
> POPLINE
> Proquest
> ScienceDirect
> TRIP
> Wiley Online Library
> SPORTDiscus
> Web of Science
> + many more…!

Consult your Librarian!

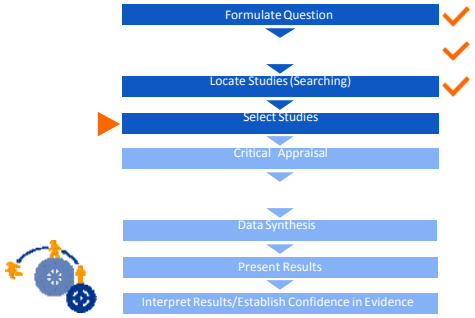
Grey literature

Sources:
> Mednar
> WorldWideScience.org
> PsycEXTRA
> OAIster
> OpenGrey (SIGLE)
> Google Scholar
> Google
> Clinicaltrials.gov

Limitations:
> Seen as biased
> Lack of indexing
> Inability to refine your search
> Time consuming


Session 8:
Study Selection

Study Selection in JBI SUMARI



joannabriggs.org

Study Selection

> Study selection is an initial assessment that occurs following the review search

> It addresses the question "should the full text of the paper be retrieved?"

> It is essential to use two assessors in the selection process to limit the risk of error and bias. This should be done independently

Study Selection Process

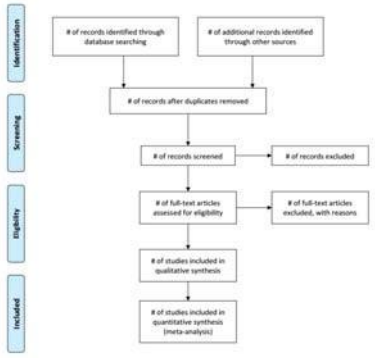
Stages of Study Selection:

1. Collate all results
2. Remove duplicates
3. Screen title and abstract for potential retrieval of full text
4. Screen full text for inclusion/ exclusion in the review
5. Screen reference lists of included studies

> Studies excluded at the full text phase require a reason for exclusion

PRISMA Searching Process

PRISMA 2009 Flow Diagram



Selection Process

> Aims to select only those studies that address the review question and that match the inclusion criteria documented in your protocol

> Selection should be transparent and reproducible

> Consider resource implications

Selection Process

> Issues may arise during study selection that require discussion/clarification between assessors

> Discuss how disagreements will be resolved

– E.g. will a third reviewer be used?

> Assessors may want to pilot some papers before undertaking full study selection

Selection Process

> Scan titles and abstracts
> Some common problems with identifying studies/papers:
  – Duplication of studies
  – Unclear titles
  – Lack of abstract
> Err on the side of caution - Inclusive!
> If uncertain? Retrieve - scan fulltext

Selection Process

> Is the article published in the stated years?
> Does the population studied meet the criteria?
  – E.g. adults or children or both?
> Does the study look at the interventions or phenomena stated in the research question
  – E.g. oral or I.V. administration
> Is it the correct study design?
  – E.g. RCT or meta-analysis

Activity 6

Selecting Studies

> Split into pairs
> Read the review protocol by Vernaya and McAdam 2015
> Review the list of titles (and abstracts where available) and indicate which papers should be retrieved
> Compare your results with your group member
> select include/exclude for each relevant paper
> Report back

Session 9:

Protocol Development

Protocol Development

> A protocol:

- Guides the specific direction of the review
- Describes inclusion criteria
- Identifies the appropriate search sources and resources
- Describes methods of study selection, appraisal, extraction and synthesis

Protocol Structure

- Title
- Authors
- Review question
- Background
- Keywords
- Methods:
  - Inclusion criteria
  - Search strategy
  - Study selection
  - Critical appraisal
  - Data extraction
  - Data synthesis
  - Assessing confidence
- Conflicts of Interest
- Acknowledgements
- References
- Appendices
  - Search strategy example
  - Appraisal instruments
  - Data extraction instruments

PRISMA-P

- PRISMA-P statement provides guidance on reporting for protocols
- Checklist contains 17 numbered items that they recommend should be described at a minimum
- Grouped into: administrative information, introduction, and methods

Background

- Describe the issue under review, including:
  - Target population, interventions, outcomes, phenomena of interest, context if applicable
- Should concisely overview the main elements of the review, and issues within the topic of choice
- Provide adequate detail to justify the conduct of the review and choice of inclusion criteria
- Provide necessary definitions of important terms and concepts
- If systematic reviews exist on the topic explain how this one will be different
- ~1000 words

Conflicts of interest

> A statement should be included in every review protocol being submitted to JBI that either declares the absence of any conflict of interest, or describes a specified or potential conflict of interest

Deviations from the Protocol

> Ideally the review should follow the protocol exactly
> Any deviation needs to be clearly detailed in the review report
> JBI reviews should also include a sentence indicating: 'The objectives, inclusion criteria and methods of analysis for this review were specified in advance and documented in a protocol'
  - Provide reference and PROSPERO rego number if applicable
  - Should appear in final line of the background section

Activity 7

Developing a protocol

>

In Summary

- Evidence-based healthcare can be seen as 'clinical decision making that considers the best available evidence; the context in which the care is delivered, client preference; and the professional judgment of the health professional'
- Systematic reviews aims to provide a comprehensive, unbiased synthesis of many relevant studies/papers in a single document. They follow a structured process that requires explicit and exhaustive reporting of the methods used in synthesis
- A protocol pre-defines the objectives and methods of the systematic review. It must be done prior to conducting the systematic review

In Summary

- Development of a question has the most significant impact on the conduct of a systematic review as the subsequent inclusion criteria are drawn from the question and provide the operational framework for the review. There are a variety of mnemonics to help reviewers structure their review question
- Searching attempts to find all eligible studies/papers to consider for inclusion. A Review considers both published and unpublished studies/papers
- A comprehensive search strategy should consist of both keywords/free-text words and index terms
- Study Selection addresses the question "should the paper be retrieved? It should be done by two people independently

Section 10:

Assessment

Module 1 Evaluation

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