Systematic Review

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Session Objectives

- In this session we will:

- Explore differences between the background literature review and the systematic review of the literature.

- Plan your question and search strategy for SR

What is a literature review?

"The selection of available documents (both published and unpublished) on the topic, which contain information, ideas, data and evidence written from a particular standpoint to fulfil certain aims or express certain views on the nature of the topic, and how it is to be investigated, and the <u>effective evaluation of these documents in relation to the research being proposed"</u> (Hart 1998)

Student activity

- What is the purpose of the literature review in your project

- What type of literature can you draw upon

- How do you manage and find relevant literature. How do you decide what literature should be included?

- How do you evaluate the literature

- How do you present the findings.

How is knowledge on the subject structured and organised?

What are the key sources?

What are the key theories, concepts and ideas?

Questions a Literature Review may answer

What are the epistemological and ontological grounds for the discipline?

What are the major issues and debates about the topic?

What are the origins and definitions of the topic?

What are the main questions and problems that have been addressed to date?

Purpose of the Literature Review in your project

- Places your study in a social, political or historical context
- Distinguishes between what has been done already and what needs to be done
- Rationalises the significance of the problem
- Defines and limits the problem you are working on
- Discovers important variables relevant to the topic
- Relates ideas and theory to practice
- Identifies the main methodologies and research techniques that have been used previously.
- Establishes need for the SR and type of SR.

Doing the literature review

Link to your research topic

1. Background information and ideas search
2. Begin mapping topic
3. Focus topic and analyse information needs
4. Detailed search of sources
5. Secondary evaluation of the literature

Literature Search (unsystematic)

- Databases
- Hand searching
- Websites for reports and 'grey literature'
- Key words/phrases
- Record search strategy/ Construct initial bibliographies/ reference list
- Data extraction form
- Iterative process

Assessing relevance and quality in a literature review 1

- **Conceptual framework**
  - Are the aims clearly stated and research questions clearly identified?
  - Does the author link work to an existing body of knowledge?
- **Study Design**
  - Are the methods appropriate and clearly described?
  - Is context of study well set out? Does research design account for possible bias?
  - Are limitations of research explicitly stated?

Assessing relevance and quality in a literature review 2

- Research analysis
  - Are the results clearly described and valid and reliable?
  - Is the analysis clearly described?
- Conclusions
  - Are all the possible influences on the observed outcomes considered?
  - Are the conclusions linked to the aim of the study?
  - Are the conclusions linked to the analysis and interpretation of data?

Structure of a literature review

- Report search strategy
- Propose possible cause of the problem (your hypothesis or question)
- Describe the nature of the problem
- Identify variables (themes) that are connected to your main research topic
- Provide evidence to support your argument
- Clarify any confusing areas
- Summarise the argument
- Make links to your project.

A good literature review should:

- Compare and contrast different authors' views on a subject
- Group authors who draw similar conclusions
- Criticise aspects of methodology
- Note areas in which authors are in disagreement
- Highlight exemplary studies
- Highlight gaps in the research
- Show how your study relates to previous studies
- Show how your study relates to the literature in general
- Conclude by summarising what the literature says.

Caulley (1992)

Effective Critical Writing

- Agreeing with another person's position through evaluating its strengths and weaknesses
- Conceding that an existing approach may have some merits which can be useful whilst rejecting others
- Selecting elements from existing arguments and reformulating them to form a synthesis: a new point of view on a subject
- Finding fault in an argument identifying inaccuracies, lack of evidence, or inconsistencies
- Identifying errors in a criticism made by others to provide a correct and balanced criticism, and so advocating or supporting the original work.

Learning Outcome 1

- Identify and critically evaluate relevant concepts, models and principles that inform and illuminate the area of inquiry.

    – background literature review

- Think about your research question

- What are some of the key issues you might wish to include in your background review to provide a context and rationale for your SR.

- What sources might you access?

Learning outcome 3

- Select, critically justify and apply appropriate methodologies, techniques and practical strategies in data collection, interpretation and dissemination.
  - methodology.
  - results

What is a systematic review

Systematic reviews are …

- "… reviews that adhere closely to a set of scientific methods that explicitly aim to limit systematic error (bias), mainly by attempting to identify, appraise and synthesise all relevant studies (of whatever design) in order to answer a particular question (or set of questions)."

- Petticrew and Roberts 2006

Paradigm – Ontology & Epistemology.

- Systematic reviews stem from positivist tradition
- Aims to bring objectivity, rigour, transparency, replication & elimination of bias to the process of synthesising evidence.
- Traditionally used to address questions which were best answered by quantitative research studies
- Recently address questions which could be answered by both quantitative (positivist)or qualitative (interpretivist) studies.

Explore underpinning paradigms in your methodology.

- You must discuss research paradigms that influence your research methodology.
- Use relevant terminology
- Ontology & epistemology
- Positivism
- Interpretivsim
- Qualitative or quantitative research.
- Link to your research question.

Systematic Reviews

- Integrative research reviews – narrative summaries of primary research which uses analytical reasoning to produce conclusions

- Meta-analysis – combines quantitative results using statistical techniques

- Meta-synthesis - combines results from several/many qualitative studies

Differences between Literature review and Systematic review

	Literature review	**Systematic review**
Question	If there is a question it will be broad in scope	Narrow and focused
Purpose	Highlights of an issue, varying degrees of thoroughness	Thorough examination of a specific issue
Production process	No standards, process is not described.	Standards exist and the process used is described in the report.
Search	Often Limited	As exhaustive as possible

Differences between Literature review and Systematic review

	Literature review	Systematic review
Inclusion	Primary studies, theoretical literature, essays, opinion articles.	Primary research reports, data from large databases.
Selection	Quality filter not used	Should use a quality appraisal filter
Report	Often selective based on purpose (cherry picking)	Inclusive of all qualifying studies
Transparency	Often not replicable	Replicable

Research Question-Narrow & Focussed.

- Aim – to determine effectiveness of planning the discharge of patients from hospital to home.

- Objectives
  - Does discharge planning improve the appropriate use of acute care
  - Does discharge planning improve or at least have no adverse effect on patient outcomes?
  - Does discharge planning reduce overall health care costs

  Question – Is discharge planning effective in managing appropriate and cost effective discharge for patients from hospital to home?

Reasons to undertake a systematic review – justify your decision.

- When there is uncertainty around an issue.
- When large amounts of information need to be assimilated quickly and efficiently.
- To reduce potential sources of bias.
- To increase the precision of the overall result (meta-analysis).
- So that the conclusions can be considered more accurate and reliable.
- To seek out new knowledge which might not have been apparent in the original studies

How to do a systematic review

1. Clearly define the research question.
2. Prepare protocol.
3. Comprehensive search.
4. Screen the results of the search.
5. Critically appraise the included research.
6. Extract data relevant to research question.
7. Synthesise the research.
8. Write up the findings.
9. Today we will look at steps 1-4

1 Clearly Define the Question

- Get the question right! Can it be answered and do others want the answer to the question?
- Are you asking the right question?
- Is a SR required and is it the best methodological approach?
- Has the SR already been done or is it currently being undertaken?

When might a new review be appropriate

- When you are concerned about the thoroughness or science of the existing review.

- When you think there might be a key piece of research missing from the review.

- When it was undertaken some time ago and there is now more research available.

When might a review <u>not</u> be appropriate?

- If a SR is not the right methodological approach to answer the research question.

- If there is already a scientifically rigorous SR available that answers the same question.

- If someone is currently undertaking a SR with the same question.

- If the review question is too vague or broad.

- If the question is too limited in scope so that the results are unlikely to be useful.

Justify your methodology (Student activity)

- In your assignment you must justify why you used a systematic review.

- Think about some of the points we have just discussed.

- Are any points relevant you can make use of?

Searching for previous reviews

- Finding systematic reviews
  - Cochrane Library
  - Centre for reviews and dissemination(CDSR)
  - The Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre)
- TRIP database
  - National Research Register (including Ongoing Reviews
  - database)
  - (http://www.york.ac.uk/inst/crd/search.htm)
- Finding systematic reviews on your topic can also help you to scope the size of the literature

2 Protocol

- Question(s)
- Search strategy
- Inclusion & exclusion criteria
- Quality appraisal Strategy
- Data extraction strategy
- Proposed analysis Strategy
- Plans for reporting
- Project timetable

Defining the Question

- PICO
  - P   **P**opulation/Problem
  - I   **I**ntervention
  - C   **C**omparison
  - O   **O**utcomes

  - *May not need to use all elements of PICO*

SPICE framework – structuring a question into searchable components- Qualitative

- S Setting
- P Perspective
- I Intervention
- C Comparison
- E Evaluation

PEO framework – structuring a question into searchable components- Qualitative

- P- patient or population and their problem
- E- Exposure
- O Outcome

Question development

- Question – *Is discharge planning effective in managing appropriate and cost effective discharge for patients from hospital to home?*

- What are the PICO elements in this question?

PICO

- P=hospital inpatients irrespective of gender, illness or age

- Intervention = structured discharge planning

- Comparators = standard care with no structured planned discharge

- Outcomes =length of hospital stay: readmission rates: patient satisfaction: carer satisfaction :complication rate; costs of discharge planning; patient health status

Search strategy (student activity)

- What did you learn in the library session about developing search strategy?
- Work in pairs to identify key stages in a search.

Search strategy: How to prepare

- **Require a clear research question**
- break down the question into   component parts Or   concepts
- Use a framework eg PICO SPICE or PEO
- Indicate types of studies required PICO (S)
- Consider any limits for the search
- Develop **Inclusion and exclusion** criteria – justified –report this in your project.

Question definition, e.g. Is Ventolin effective in improving lung function for Asthmatic Patients

- Patient Group   asthmatic adults
- Intervention   Ventolin
- Comparison   No Ventolin/other treatments
- Outcome   improved lung function
- Study design   RCT
- Other Limits   English language Uk based
- Time limit   2006 -2013

Converting PICO into a search strategy

- PICO (S)
- Create a list of search terms for each concept
- Combine all the search terms within a concept using OR
- Combine the concepts using AND, and possibly NOT

Variants on PICO

- PICO does not have to be converted into a search in its entirety.

- Only use the concepts for the search that are helpful and relevant

- Add or delete concepts e.g. PIC, IC, PICL

- This will be determined by your question

Can participating in creative activities enhance the health and wellbeing of children and young people aged between the ages of 11-18? PICO elements.

- Population: young people 11-18
- Intervention: creative arts
- Outcome: health & wellbeing.

- Study design: Quantitative & qualitative designs
- Limits: 2004

Student Activity
Create list of search terms by concept

- For each part of PICO (concept) gather terms which describe subject of interest
- Identify synonyms
- Identify abbreviations
- Identify related terms

Search terms

Word group 1	Word group 2	Word group 3
Young* Youth Adolescen* Teenage* Juvenile* Pupil* Student* School*	Music* Drama Danc* Singing Song* Theat* Art "Visual art*"	Evaluat* Research Intervention* Results Outcome* Impact

Notes: * truncation.
"phrase searching"
Words within groups combined with OR.
Groups combined with AND.

Limits:
2004 to current day
English language abstracts
11-18 years old
'education' OR 'community' settings

Combining terms and concepts: Boolean operators

- AND – makes results set smaller
- OR – makes results set larger
- NOT – excludes things, e.g. records published before a given date

Research Designs REMEMBER

- Question you ask may best be answered by

1. Quantitative research

2. Qualitative research

3. Both- mixed method.

4. SR Tool is from positivist paradigm but you may need to draw on other research approaches to answer the question you have posed

Comprehensive search

- Undertake a refined & systematic search for all related research

- No relevant research studies should be overlooked

- You will need to read many more studies than those eventually included in the review

Why search widely

- not all research is published in journals
- not all research published in journals is indexed on major databases
- not all research that we know is indexed on databases can be easily retrieved by the specific search strategy we develop
- research is not always described in the same way by authors
- research can often be poorly reported

Where to search

- General & Specific electronic databases: MEDLINE, EMBASE, PsycINFO   CINHAL, PEDRO university library.
- Grey literature - reports, conference proceedings

  www.greynet.org.

- Research registers eg clinical trials online, national research registers, institutional repositories

- Internet (Google Scholar, OMNI etc)

- Conference proceedings

- Hand searching; ToC from Journals

Where to Search

- Reference lists from journal articles, books
- Contacting experts, researchers, key organisations, and field leaders in the topic area
- Specialist websites eg DoH, WHO
- *Must justify your search strategy in your report.*
- *Keep Field notes*

Documenting the search process

- Record
- the database (e.g. MEDLINE)
- the database provider (e.g. Ovid)
- search strategy (search terms used)
- date of the search
- results of the Search
- Record other resources searched
- Manage references (software….)
- Details of individual searches can be included in appendices.

Database	Initial Hits	Results after relevance screening
BNI (British Nursing Index)	93	26
British Education Index	103	7
CINAHL (Cumulative Index to Nursing and Allied Health Literature)	65	6
ASSIA (Applied Social Sciences Index and Abstracts) IBSS (International Bibliography of the Social Sciences) PILOTS	891	17
BHI (British Humanities Index)	17	2
EMBASE	16	0
HMIC (Health Management Information Consortium)	0	0
PsycInfo	832	23
MEDLINE	775	17
SPORTDiscus	505	6
Social Policy and Practice	208	21
Web of Knowledge (includes Science Citation Index; Social Sciences Citation Index; Arts and Humanities Citation Index)	65	2
Index to Theses	372	1
Cochrane Library	559	2
TOTAL	4528	130
Total following removal of duplicates and application of inclusion/exclusion criteria		20

Screen the results of the search

- Only include papers that are relevant your research

- They should meet the inclusion & exclusion criteria in your protocol.

- You need to obtain full text.

- Read the papers!!

- Record reasons for papers being excluded. *This can be included as table in main text.*

Moher, D. et al. BMJ 2009;339:b2535
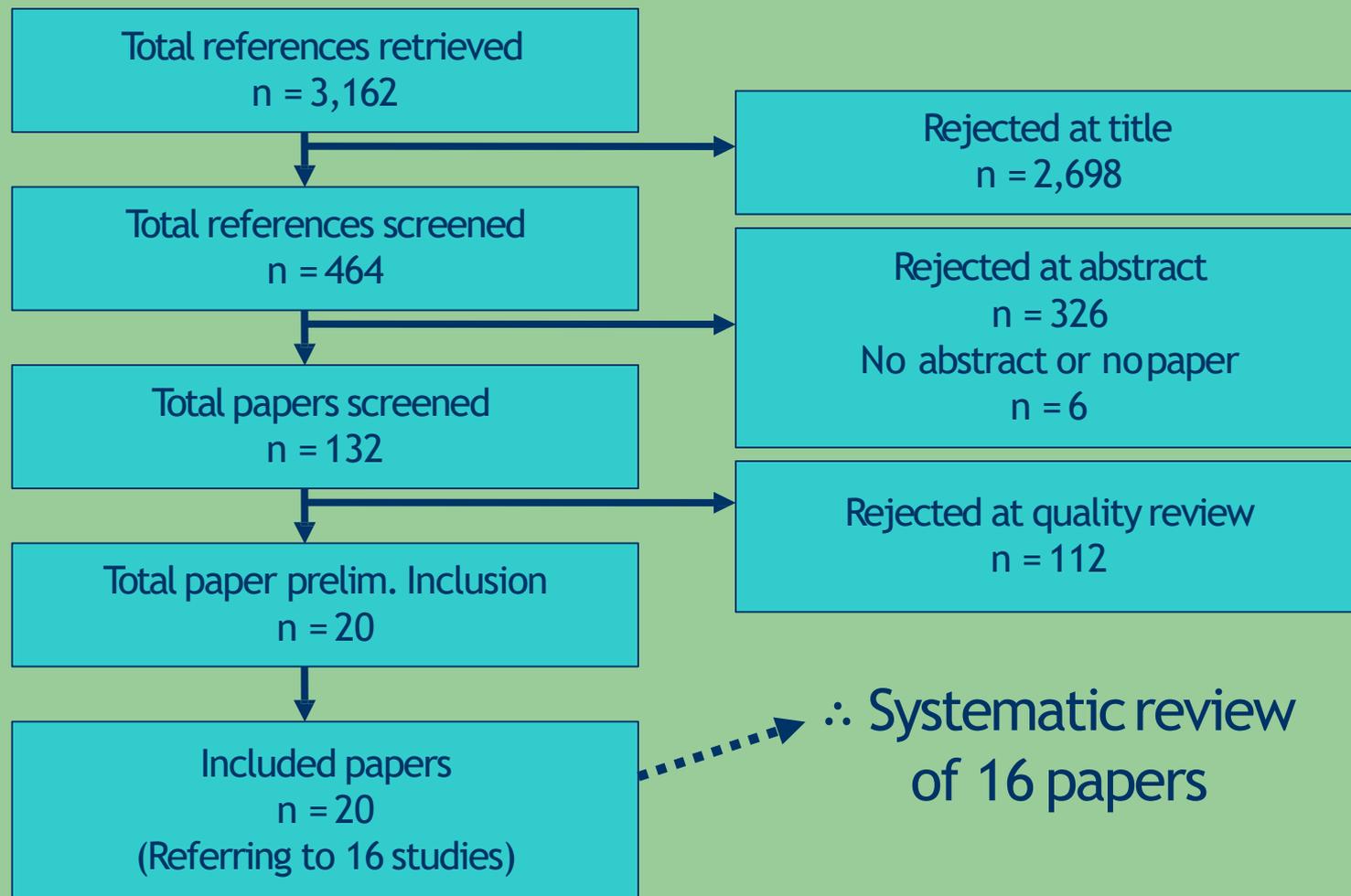
Systematic review

- To be continued next time