SEARCHING IN CONTEXT OF SYSTEMATIC REVIEWS

SPH 5005 MPH PRACTICUM MODULE
SPH 6770 GRADUATE RESEARCH SEMINAR IN PUBLIC HEALTH MODULE

http://libguides.nus.edu.sg/sysreviews

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MD1-08-01A
LEARNING OBJECTIVES

After this session you should be able to:

1. Develop an answerable research question and structure a search using the PICO format
2. Identify & recognize the breadth of resources required to execute a systematic review search
3. How to search the databases
4. Conduct a scoping search in Cochrane Library.
5. Developing search strategy in PubMed and Embase
**SYSTEMATIC REVIEW PROCESS**

1. **Framing the question**
   - Write your protocol

2. **Identifying relevant literature**
   - Searching - screening - selection (in/out criteria)

3. **Assessing the quality**

4. **Summarizing the evidence**

5. **Interpreting the findings**

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**Systematic search** is a key component of all systematic reviews

- Defined search strategy
- Clear inclusion and exclusion criteria

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FRAMING THE QUESTION

Develop an answerable research question using the PICO format
PICO

PATIENT, POPULATION OR PROBLEM How would you describe a group of patients similar to yours? What are the most important characteristics of this patient population? What is the main problem or condition of interest?

INTERVENTION, EXPOSURE, PROGNOSTIC FACTOR What main intervention (diagnostic test, prevention strategy, treatment, activity, etc.) are you considering? Is there an exposure, risk, or prognostic factor of interest?

COMPARISON (if applicable) What is the main alternative being considered, if any?

OUTCOME What are you trying to accomplish, measure, improve, or affect?
Does the use of **pedometer** in the **workplace** encourage **office workers** to be more **physically active**?

<table>
<thead>
<tr>
<th>P</th>
<th>Office workers in the workplace</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Pedometer</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>None or alternative workplace health promotion interventions</td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>to improve physical activity or other health related outcomes</td>
<td>X</td>
</tr>
<tr>
<td>T</td>
<td>RCT</td>
<td>3</td>
</tr>
</tbody>
</table>
What is the effectiveness of water fluoridation for preventing dental caries?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P</strong></td>
<td>Populations of all ages</td>
<td>X</td>
</tr>
<tr>
<td><strong>I</strong></td>
<td>Fluoridated water</td>
<td>1</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>Non-fluoridated water</td>
<td>X</td>
</tr>
<tr>
<td><strong>O</strong></td>
<td>dental caries</td>
<td>2</td>
</tr>
</tbody>
</table>
### STUDY TYPE / DESIGN MAY BE PART OF SEARCH STRATEGY

<table>
<thead>
<tr>
<th>Type of Question</th>
<th>Best type of study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapy / Prevention</td>
<td><strong>RCT</strong> &gt; Cohort &gt; Case control &gt; Case series</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Cross sectional or prospective, blind comparison to a gold standard</td>
</tr>
<tr>
<td>Etiology / Harm</td>
<td><strong>RCT</strong> (if possible and ethical) &gt; Cohort &gt; Case control &gt; Case series</td>
</tr>
<tr>
<td>Prognosis</td>
<td>Cohort &gt; Case control &gt; Case series</td>
</tr>
<tr>
<td>Cost</td>
<td>Cost effectiveness / Economic analysis</td>
</tr>
<tr>
<td>Quality of life / experience</td>
<td>Qualitative studies</td>
</tr>
</tbody>
</table>

**Therapy, prevention & etiology** questions that can be answered by RCT can also be answered by a systematic review or meta analysis. **Etiology & harm** studies can be answered by an RCT if ethical issues of the study allow it.
SOURCES FOR SYSTEMATIC REVIEW

**ALL** relevant studies published and unpublished must be found by searching (without language restriction)

1. Electronic databases
   - Medline, Embase, Cochrane (CENTRAL)
   - Subject specific (CINAHL/PsycInfo)

2. Grey literature – unpublished paper
   - Search for on-going Trials (e.g. Clinical trials.gov)
   - Meeting abstracts/Conference papers
   - Industrial research, policy papers, theses – never published, hard to get

3. Hand searching – key journals
4. Reference list of key articles
5. Contact Experts / authors – contact organizations doing systematic reviews
Subject Guide on Systematic Reviews at http://libguides.nus.edu.sg/sysreviews

Look under:

Where to Search?: List of Databases & Clinical Trial Registries

Grey Literature: Grey literature sources, conference proceedings, newspapers, theses

Searching for systematic reviews: Links to organizations doing systematic reviews

Refer to: DATABASE COVERAGE GUIDE for systematic reviews in public health
DEVELOP A SEARCH STRATEGY
-- BASIC SEARCH SYNTAX

1. BOOLEAN LOGIC (AND, OR, NOT)
2. PHRASE SEARCHING
3. TRUNCATION
4. BRACKETS

Do you understand search syntax?
Have fun with QUIZ (https://kahoot.it)
BOOLEAN LOGICS

**OR**
- cancer
- tumour
- Any of the search terms may be present
- Retrieve articles on --> (cancer OR tumour)

**AND**
- Smoking
- Cancer
- All search terms must be present
- Retrieve articles on → (smoking AND cancer)

**NOT**
- Human
- Animal
- Exclude terms from your search
- NOT → Use with caution
- E.g. Humans NOT animals

**Note:** In PubMed, Boolean operators ‘AND’, ‘OR’, and ‘NOT’, must be entered in UPPERCASE.
PHRASE SEARCHING “ ”

Searches exact phrase

“dental erosion”
“prevention of dental caries”
TRUNCATION *

Searches spelling variants: adolescen*

adolescent
adolescents
adolescence
adolescences

Note: *Pubmed searches only first 600 variants
Use to combine concepts in a prescribed order in a search statement:

“dental erosion” AND (soft drink* OR carbonated drink*)

Grouping terms to be processed first
DEVELOP A SEARCH STRATEGY
-- SEARCHING THE DATABASE

1. KEYWORD/TEXT WORD
2. SUBJECT HEADING
KEYWORDS

• Free text, text word or natural language term

• Search for words in the document

• Less precise but retrieve the latest studies

• Useful when there is no MeSH term available to represent the concept

• Some databases do not have Subject headings/ Controlled vocabulary
  • Scopus
  • Web of Science
SUBJECT HEADINGS

Controlled vocabulary, thesauri or indexed terms

• Medline – MeSH (Medical Subject Headings)
• Embase – Emtree
• CINAHL – CINAHL Headings
• PsycINFO – Thesaurus of Psychological Index Terms

Consistent way to retrieve information that may use different terminology for the same concept
# SUBJECT HEADING VS KEYWORD

<table>
<thead>
<tr>
<th>MeSH / EMTREE</th>
<th>Keyword</th>
</tr>
</thead>
<tbody>
<tr>
<td>More specific</td>
<td>Broader; less precise</td>
</tr>
<tr>
<td>Retrieves citations indexed with MeSH / Emtree terms, slightly dated (time lag, older)</td>
<td>Retrieves all kinds of records, including the latest studies (as supplied by publisher)</td>
</tr>
<tr>
<td>Consistent way to retrieve information that may use different terminology for the same concept</td>
<td>Useful when there is no MeSH/Emtree term available to represent the concept</td>
</tr>
</tbody>
</table>
SEARCH STRATEGY-- SYSTEMATIC REVIEW

Keywords
(added by the author)

OR

Mesh / Emtree terms
(added by the indexer)

Retrieves all articles on that concept

Cochrane Standard: each concept must be searched using keywords and Index terms
SCOPING SEARCH USING

SCOPING SEARCH
• **Protocol**: Someone already doing a similar study
• **Size of Literature**: Are there enough primary studies?
• **Cost**: Estimate cost of review

IN:
The Cochrane Library: Find Reviews, Protocols, Trials
PubMed Clinical Queries
Google Scholar
Organizations doing systematic reviews E.g. AHRQ, Health Evidence Canada, National Institute for Health and Clinical Excellence (NICE)

PEARL GROWING SEARCH*
**Identify Key articles**– Citing articles /References
Other closely related studies– Look at “Related Searches”, “Similar articles”
Does regular consumption of soft drinks lead to dental erosion in healthy teenagers?

<table>
<thead>
<tr>
<th>PICO Concepts</th>
<th>Keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P</strong> Teenagers</td>
<td>(teen OR teens OR teenager* OR adolescen* OR young adult*)</td>
</tr>
<tr>
<td><strong>I</strong> Soft drinks</td>
<td>(carbonated drink* OR soft drink*)</td>
</tr>
<tr>
<td><strong>C</strong> Comparator</td>
<td></td>
</tr>
<tr>
<td><strong>O</strong> Dental Erosion</td>
<td>(dental erosion* OR teeth erosion* OR tooth erosion* )</td>
</tr>
</tbody>
</table>
SCOPING SEARCH IN

Copy and paste the following into the search box below:

(carbonated drink* OR soft drink*) AND (dental OR teeth OR tooth OR enamel OR dentin OR dentine)
Search methods for identification of studies

The original review involved searching a wide range of databases from their starting date to June/October 1999 (Appendix 1). Full details of all the strategies initially used have been published previously (McDonagh 2000).

For the identification of studies included or considered for this updated review, we developed detailed search strategies combining controlled vocabulary and free text terms for each database searched. These were based on the search strategy developed for MEDLINE (Appendix 4) but revised appropriately for each database to take account of differences in controlled vocabulary and syntax rules.

Electronic searches

We searched the following electronic databases (from inception):

- The Cochrane Oral Health Group's Trials Register (to 19 February 2015; see Appendix 2);
- The Cochrane Central Register of Controlled Trials (CENTRAL; The Cochrane Library 2015, Issue 1; see Appendix 3);
- MEDLINE via OVID (1946 to 19 February 2015; see Appendix 4);
- EMBASE via OVID (1980 to 19 February 2015; see Appendix 5);
Research Question:
Does regular consumption of soft drinks lead to dental erosion in healthy teenagers?
PubMed
- Biomedicine & life science journals
  (28 million records)
- MEDLINE, largest component of PubMed
  (24 million records from 5600 journals)

Strengths of MEDLINE
- Medline indexed using MeSH
- Updated daily – in press, ahead of print
- Coverage: US & 80 other countries

Free access at https://www.ncbi.nlm.nih.gov/pubmed
PLANNING YOUR SEARCH USING PICO

Does regular consumption of soft drinks lead to dental erosion in healthy teenagers?

<table>
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<td>P</td>
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</tr>
<tr>
<td>I</td>
<td>Soft drinks</td>
<td>(carbonated drink* OR soft drink*)</td>
</tr>
<tr>
<td>C</td>
<td>Comparator</td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>Reducing dental Erosion</td>
<td>(dental erosion* OR teeth erosion* OR tooth erosion* )</td>
</tr>
</tbody>
</table>
Medical Subject Headings (MeSH)

Carbonated Beverages

Drinkable liquids combined with or impregnated with carbon dioxide.

Year introduced: 1991 (1975)

PubMed search builder options

Subheadings:
- administration and dosage
- adverse effects
- analysis
- classification
- economics
- etiology
- history
- metabolism
- microbiology
- organization and administration
- pharmacology
- physiology
- poisoning
- standards
- statistics and numerical data
- supply and distribution
- therapeutic use
- toxicity
- utilization
MESH ENTRY TERMS: SYNONYMS

MeSH Unique ID: D002253

Entry Terms:

- Beverage, Carbonated
- Beverages, Carbonated
- Carbonated Beverage
- Carbonated Drinks
- Carbonated Drink
- Drink, Carbonated
- Drinks, Carbonated
- Soft Drinks
- Drink, Soft
- Drinks, Soft
- Soft Drink
- Soda Pop
- Pop, Soda
- Pops, Soda
- Soda Pops

All MeSH Categories

Phenomena and Processes Category
Physiological Phenomena
Diet, Food, and Nutrition
Beverages
Carbonated Beverages
Carbonated Water
Combine the two search statements using ‘OR’ as shown below:

"Carbonated Beverages"[Mesh] OR carbonated beverage*[tiab]
OR carbonated drink*[tiab] OR soft drink*[tiab]
PUBMED SEARCH STRATEGY
-- OUTCOME (O) TERM

O (Keyword) → (dental OR tooth OR teeth OR enamel) AND (erosion OR erosions OR caries OR carious OR lesion OR lesions)

OR

O (MeSH) → "Tooth Erosion"[Mesh] OR "Dental Caries"[Mesh]

Combine the two search statements using ‘OR’ as shown below:

## PUBMED SEARCH RESULTS

--- Combine ‘I’ AND ‘O’

### History

<table>
<thead>
<tr>
<th>Search</th>
<th>Add to builder</th>
<th>Query</th>
<th>Items found</th>
</tr>
</thead>
<tbody>
<tr>
<td>#12</td>
<td>Add</td>
<td>Search (&quot;Tooth Erosion&quot;[Mesh]) OR &quot;Dental Caries&quot;[Mesh]</td>
<td>45346</td>
</tr>
<tr>
<td>#9</td>
<td>Add</td>
<td>Search (&quot;Carbonated Beverages&quot;[Mesh]) OR ((carbonated beverage*[Title/Abstract] OR carbonated drink*[Title/Abstract] OR soft drink*[Title/Abstract]))</td>
<td>5299</td>
</tr>
<tr>
<td>#8</td>
<td>Add</td>
<td>Search (carbonated beverage*[Title/Abstract] OR carbonated drink*[Title/Abstract] OR soft drink*[Title/Abstract])</td>
<td>3853</td>
</tr>
<tr>
<td>#7</td>
<td>Add</td>
<td>Search &quot;Carbonated Beverages&quot;[Mesh]</td>
<td>2653</td>
</tr>
</tbody>
</table>
DEVELOP A SEARCH STRATEGY -- SEARCHING EMBASE

Research Question: Does regular consumption of soft drinks lead to dental erosion in healthy teenagers?

Replicate Search from PubMed to EMBASE
Subject coverage
• Biomedical (in-depth coverage of pharmacology, pharmaceutical science and clinical research), medical devices; life sciences & allied health

Content:
• >32 million published and peer-reviewed records, in-press publications
• Coverage of 8,500 indexed peer-reviewed journals from 1947 (including MEDLINE titles)
• Over 2.3 million conference abstracts indexed from more than 7,000 conferences dating from 2009

Strengths:
• Deep full-text indexing with Emtree thesaurus (75,000+ terms), includes all MESH terms, particularly strong in drug, disease and medical device terms
• >30% of Embase journal titles are unique (i.e., not covered by MEDLINE)
1. Click SEARCH tab
2. Select PICO tab
3. Select ‘Find best term’
4. Fill in the PICO Search Form

Fill in Population terms (Combine EMTREE headings + Synonyms)

Fill in Intervention terms (Combine EMTREE headings + Synonyms)
Type ‘carbonated drink’ into the ‘Intervention’ PICO search form, EMTREE suggested to use the preferred term ‘carbonated beverage’ and ‘carbonated drink’ as a free text term.
Apart from searching ‘carbonated drink’, you can also search ‘soft drink’. Search the free text terms in the Title/Abstract field.
Type ‘dental erosion’ into the ‘Outcome’ PICO search form, EMTREE suggested to use the preferred term ‘tooth disease’. For ‘tooth decay’ concept, the EMTREE term is ‘dental caries’.
The PICO Search from will automatically combine the ‘Intervention’ and ‘Outcome’ to display the search results.

Search Strategy shown below:
WHAT IS ENDNOTE?

A bibliographic management tool to:

1. store citations
2. organise citations
3. format citations
INSTALLING ENDNOTE X8

http://libguides.nus.edu.sg/endnote

EndNote: Installation

EndNote (EN) is a software for managing references. It can automate the many tedious steps involved in organizing and formatting the references and bibliographies in your academic writing. EndNote Web (ENW) is the web version of EN, with fewer features.

Installing EndNote

EndNote software is available to NUS staff and students free of charge for both Windows and Mac users. Endnote should be removed (un-installed) when the user is no longer a staff or student of NUS. Instructions are as follows:

Before you begin:

- Ensure that your computer is connected to NUS computer network and you have administrator rights to the pc or laptop.
- Un-install any previous versions of EndNote from your computer, and use the license transfer form which can be found on the NUS Software Catalogue, left hand panel:
CREATE A NEW LIBRARY

1. Click on **File > New ...** to create a new EndNote library
2. Enter a filename (e.g. Test Library)
3. Select location to save the library (e.g. Desktop)
4. Click Save to create EndNote file (.enl) and Data folder (.data)
MANAGE SEARCH RESULTS

EXPORTING RESULTS TO ENDNOTE LIBRARY

1. PubMed
2. EMBASE
3. Cochrane Library
PUBMED: DIRECT EXPORT TO ENDNOTE
(For search results < or = 200 citations)
PUBMED: SAVE AS TEXT FILE & IMPORT TO ENDNOTE
(For search results >200 citations)

IMPORTING INTO ENDNOTE

1. Choose Destination
   - Send to
   - Filters

2. Select File
   - Format: MEDLINE

3. Import File
   - Import File: pubmed_result.txt
   - Import Option: PubMed (NLM)
   - Duplicates: Import All
   - Text Translation: No Translation

4. Import
Click on the ‘citation-export.ris’ file to export citations to EndNote Library.
### Creating Groups

**Tagged PubMed records and drag to PubMed folder**

<table>
<thead>
<tr>
<th>Name of Database</th>
<th>Record Number</th>
<th>Author</th>
<th>Year</th>
<th>Title</th>
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<tbody>
<tr>
<td>PubMed</td>
<td>3552</td>
<td>Akhter, R.; Hass...</td>
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<tr>
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<td>2017</td>
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<td>1998</td>
<td>The effect of a carbamide containing...</td>
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<td>Ali, H.; Tahmass...</td>
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<tr>
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<td>Altimok, B.; Tan...</td>
<td>2011</td>
<td>The effect of laser-...</td>
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<tr>
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<td>3324</td>
<td>Alvarez Loureir...</td>
<td>2015</td>
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<tr>
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<td>Dental erosion and...</td>
</tr>
</tbody>
</table>
ANNOTATING RECORD WITH DATABASE DETAILS

Video on EndNote: Change and Move Fields [Video Link]
CREATING CUSTOMISED FIELDS TO VIEW RECORD DETAILS

EndNote Preferences

Fields to display in the library window

<table>
<thead>
<tr>
<th>Position</th>
<th>Field</th>
<th>Heading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Column 1</td>
<td>Record Number</td>
<td>Record Number</td>
</tr>
<tr>
<td>Column 2</td>
<td>File Attachments</td>
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<tr>
<td>Column 3</td>
<td>Author</td>
<td>Author</td>
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<tr>
<td>Column 4</td>
<td>Year</td>
<td>Year</td>
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<tr>
<td>Column 5</td>
<td>Title</td>
<td>Title</td>
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<td>Column 6</td>
<td>Volume</td>
<td>Volume</td>
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<tr>
<td>Column 10</td>
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<td>Name of Database</td>
</tr>
</tbody>
</table>

Note: Selecting the "Figure" and "File Attachment" fields will display an icon in the library window.

Display all authors in the Author field.
TO SUMMARIZE

1. Framing a focused question using PICO
2. Identifying relevant resources for systematic review
3. Carry out a scoping search
4. Developing search strategy
5. Replicate search in other databases
6. Manage references using Endnote
CONTACT US

Medical Library
Level 5, MD6
Telephone : 65162046
Email: mdlib@nus.edu.sg
www.lib.nus.edu.sg

Feedback for session on 14 September 2018 (2:00-3:30pm)
https://tinyurl.com/2018SPHS2