ENSURE - Educating students for developing high quality research skills

This material was realised with the EEA Financial Mechanism 2014-2021 financial support. Its content (text, photos, videos) does not reflect the official opinion of the Programme Operator, the National Contact Point and the Financial Mechanism Office. Responsibility for the information and views expressed therein lies entirely with the author(s).

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Literature search for the health sciences. Sibiu – October 2019

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University library
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Schedule

Learning outcomes + Why be systematic?
OR and AND + Controlled search vocabularies
Boxing in your search: Translating your research question into searchable concepts
Briefly on finding keywords and building a search
Search strategy. Quick intro to Ovid + Pubmed with MESH tip

Intended learning outcomes

- Explain the purpose of literature search for the research process.
- Select and use scientific databases for advanced literature searches.
- Build advanced searches, using subject headings, operators (AND, OR, adj/near) and search history.

Why be systematic about it?

CURRENT CONTROVERSY

The hexamethonium asthma study and the death of a normal volunteer in research

"The OHRP found that prior to approving the study, Hopkins researcher Dr Alkis Togias and the Institutional Review Board failed to uncover published literature about the toxic effects of inhaling hexamethonium. According to the OHRP, this information was "readily available via routine MEDLINE and Internet database searches, as well as recent textbooks on pathology of the lung". Togias had performed a standard PubMed search and consulted standard, current edition, textbooks ".

(Savulescu & Spriggs, 2002, p. 3).

Why be systematic about it?

Avoidable waste in the production and reporting of research evidence

Iain Chalmers, Paul Glasziou

"New research should not be done unless, at the time it is initiated, the questions it proposes to address cannot be answered satisfactorily with existing evidence. Many researchers do not do this—for example, Cooper and colleagues[13] found that only 11 of 24 responding authors of trial reports that had been added to existing systematic reviews were even aware of the relevant reviews when they designed their new studies.".

(Chalmers & Glasziou, 2009, p. 87).

Why be systematic about it?

A Comparison of Results of Meta-analyses of Randomized Control Trials and Recommendations of Clinical Experts

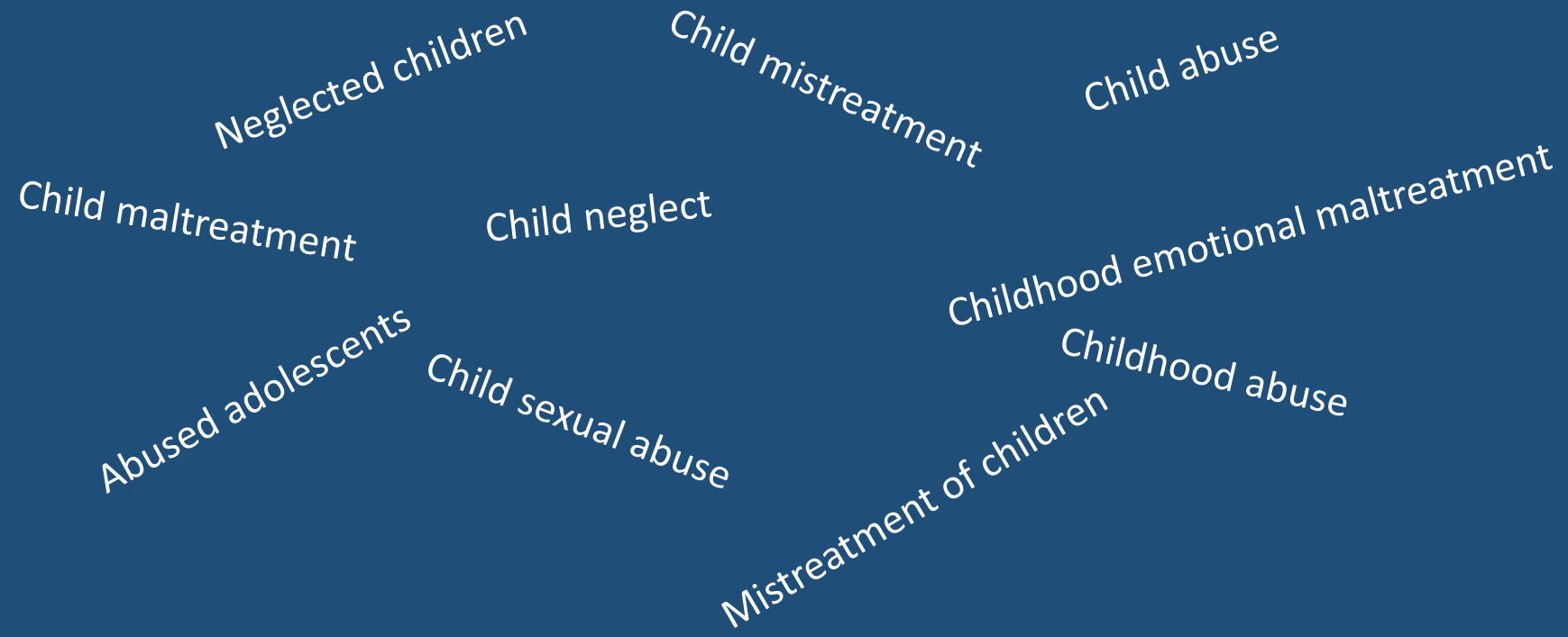
"We used the technique of cumulative meta-analysis (performing a new meta-analysis when the results of a new clinical trial are published) and compared the results with the recommendations of the experts for various treatments for myocardial infarction. Discrepancies were detected between the meta-analytic patterns of effectiveness in the randomized trials and the recommendations of reviewers. Review articles often failed to mention important advances or exhibited delays in recommending effective preventive measures. In some cases, treatments that have no effect on mortality or are potentially harmful continued to be recommended by several clinical experts.".

(Antman, Lau & Kupelnick, 1992, p. 240).

Why use controlled search vocabularies?

Synonymous expressions

Suppose we want studies on child maltreatment



Why use controlled search vocabularies?

Synonymous expressions

Suppose we want studies on child maltreatment

Child mistreatment
Neglected children
Child maltreatment
Child neglect
Abused adolescents
Child sexual abuse
Child abuse
Childhood emotional maltreatment
Childhood abuse
Mistreatment of children

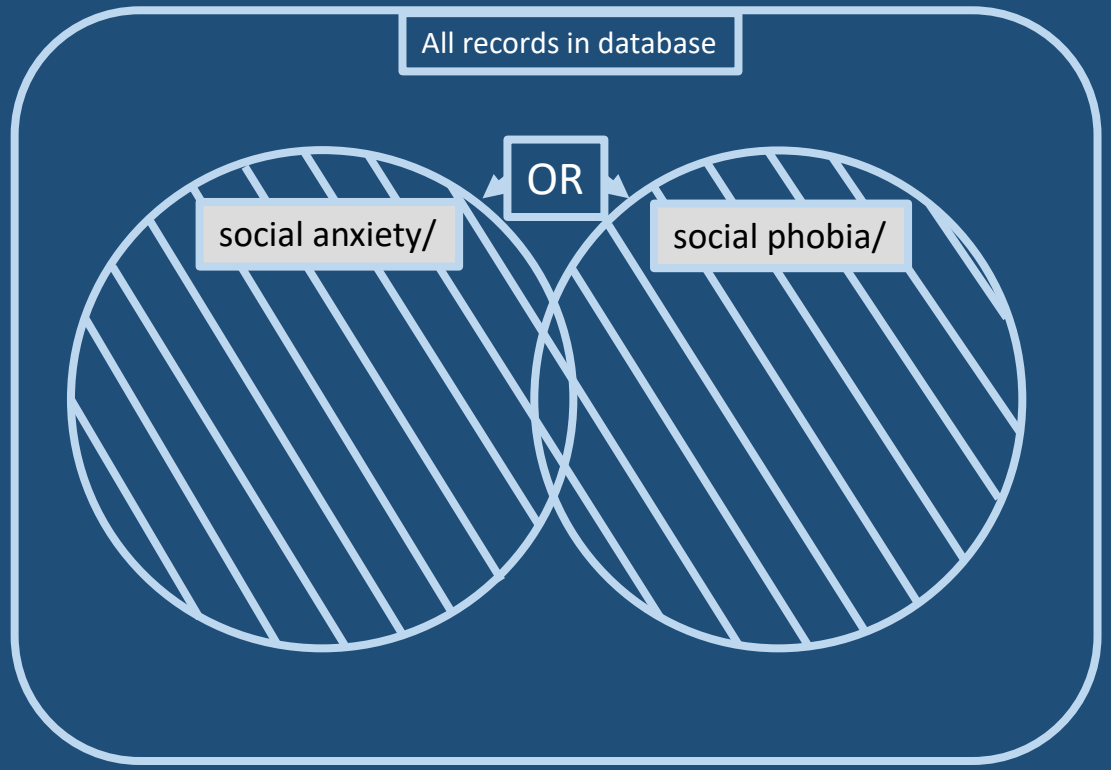
} exp Child Abuse/

Why use controlled search vocabularies?

Peripheral mentions

Many sources will mention child abuse, but only peripherally.
Indexers will then not apply the heading (we hope).

OR



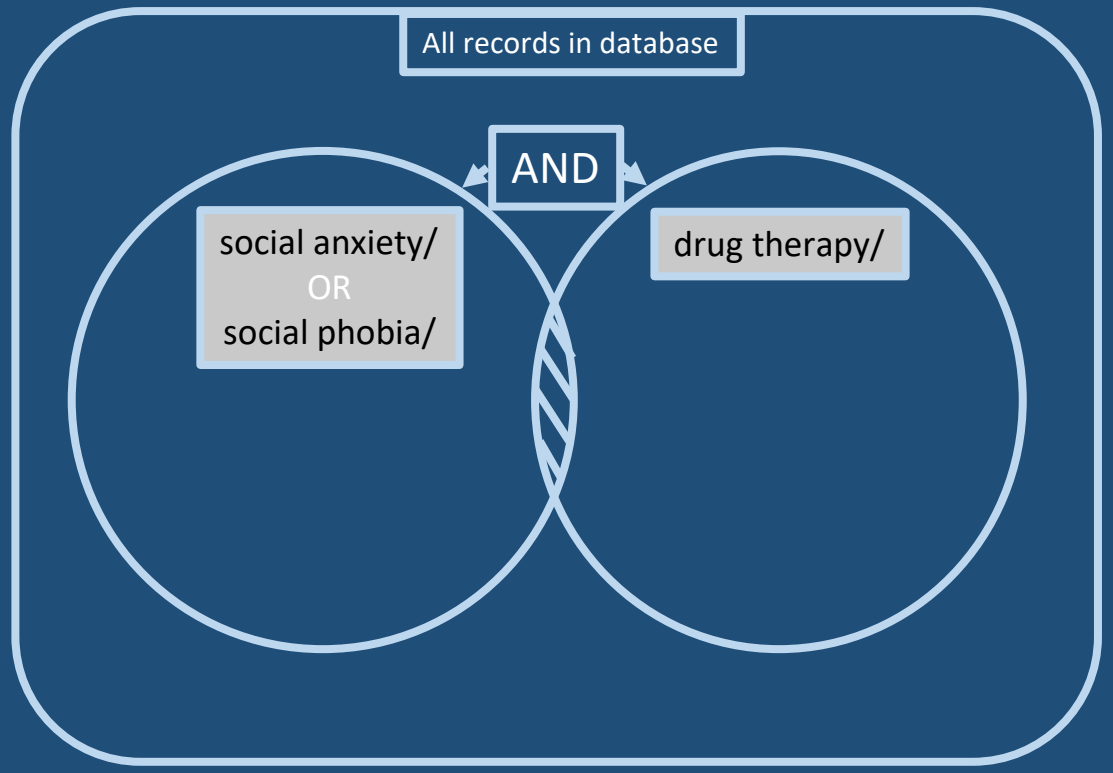
Use it to:

- Combine keywords (controlled and textwords) that belong to the same overall concept (i.e., keywords that are synonyms or almost synonyms, or instances of the concept).

Effects of combining with OR:

- Expands your search
- More OR-combinations means more records in your results list

AND



Use it to:

- Combine keywords (or sets of keywords) from different concepts, in order to capture records that are about both (or all).

Effects of combining with AND:

- Limits your search
- More AND-combinations means fewer records in your results list

Interpret/translate scientific hypothesis/objectives into search phrases

1. Periodontal diseases have been shown to carry an increased risk for preterm birth; the rationale for this assumption is based upon the fact that periodontitis may lead to maternal and fetal inflammation, thus triggering the common pathway of preterm parturition syndrome including increased uterine contractility, cervical ripening and decidua/membrane activation

2. In humans, accidental hypothermia (AH) is defined as an unintended lowering of the body temperature to below 35 ^{o}C due to exposure to cold environments or a decrease in metabolic rate. The condition has been characterized by different stages of severity based on the prevailing core temperature, as mild AH (32-35 ^{o}C), moderate AH (28-32 ^{o}C), severe AH (<28 ^{o}C), and deep AH (<20 ^{o}C)

Dental caries and preterm birth

- Think in «boxes»:

Exp Dental Caries/
OR
caries.ti,ab,kw.
OR
dental caries.ti,ab,kw.
OR
tooth decay.ti,ab,kw.
OR
decayed tooth.ti,ab,kw.
OR
decayed teeth.ti,ab,kw.
OR
(cavity adj3 tooth).ti,ab.
OR
(cavities adj3 teeth).ti,ab.
OR
exp DMF Index/
OR
DMFT.ti,ab,kw.
OR
DMF.ti,ab,kw.
OR
exp Streptococcus mutans/
OR
streptococcus mutans.ti,ab,kw.
OR
exp Streptococcus sobrinus/
OR
streptococcus sobrinus.ti,ab,kw.
OR
exp Lactobacillus acidophilus/
OR
Lactobacillus acidophilus.ti,ab,kw.

AND

exp Premature Birth/
OR
preterm birth.ti,ab,kw.
OR
exp Fetal Growth Retardation/
OR
fetal growth restriction.ti,ab,kw.
OR
exp Stillbirth/
OR
stillbirth.ti,ab,kw.
OR
exp Perinatal Death/
OR
neonatal death.ti,ab,kw.
OR
maternal sepsis.ti,ab,kw.
OR
neonatal sepsis.ti,ab,kw.
OR
exp Abruptio Placentae/
OR
placental abruption.ti,ab,kw.
OR
exp Infant, Low Birth Weight/
OR
low birth weight.ti,ab,kw.
OR
exp Infant, Small for Gestational Age/
OR
small for gestational age.ti,ab,kw.
OR
intra uterine growth restriction.ti,ab,kw.
OR
antepartum hemorrhage.ti,ab,kw.
OR
exp Diabetes, Gestational/
OR
gestational diabetes.ti,ab,kw.
OR
exp Postpartum Hemorrhage/
OR
postpartum hemorrhage.ti,ab,kw.
OR
spontaneous preterm birth.ti,ab,kw.
OR
exp Cesarean Section/
OR
cesarean section.ti,ab,kw.
OR
exp Hypertension, Pregnancy-Induced/
OR
gestational hypertension.ti,ab,kw.
OR
exp Pre-Eclampsia/
OR
preeclampsia.ti,ab,kw.
OR
pre-eclampsia.ti,ab,kw.
OR
exp Puerperal Infection/
OR
puerperal sepsis.ti,ab,kw.
OR
puerperal fever.ti,ab,kw.
OR
exp Breast Feeding/
OR
breast feeding.ti,ab,kw.
OR
exp Venous Thrombosis/
OR
deep vein thrombosis.ti,ab,kw.
OR
exp Thromboembolism/
OR
thromboembolism.ti,ab,kw.
OR
exp Pulmonary Embolism/
OR
pulmonary embolism.ti,ab,kw.
OR
exp Endocarditis/
OR
endocarditis.ti,ab,kw.
OR
exp Fetal Membranes, Premature Rupture/
OR
preterm premature rupture of membranes.ti,ab,kw.
OR
PPROM.ti,ab,kw.
OR
prelabor rupture of membranes.ti,ab,kw.
OR
PROM.ti,ab,kw.
OR
short cervix.ti,ab,kw.
OR
low apgar score.ti,ab,kw.
OR
chorioamnionitis.ti,ab,kw.

Interpret/translate scientific hypothesis/objective into search phrases

1. Periodontal diseases have been shown to carry an increased risk for preterm birth; the rationale for this assumption is based upon the fact that periodontitis may lead to maternal and fetal inflammation, thus triggering the common pathway of preterm parturition syndrome including increased uterine contractility, cervical ripening and decidua/membrane activation

2. In humans, accidental hypothermia (AH) is defined as an unintended lowering of the body temperature to below 35 ^{o}C due to exposure to cold environments or a decrease in metabolic rate. The condition has been characterized by different stages of severity based on the prevailing core temperature, as mild AH (32-35 ^{o}C), moderate AH (28-32 ^{o}C), severe AH (<28 ^{o}C), and deep AH (<20 ^{o}C)

Treatment of accidental hypothermia

- Think in «boxes»:

Treatment of accidental hypothermia – a systematic review

Hypothermia (MeSH)
OR
Accidental hypothermia (non-Mesh)
OR
Frostbite (MeSH)
OR
Cold Temperature (MeSH)
OR
Cold exposure (MeSH)
OR
Body Temperature (MeSH)
OR
Core temperature (non-MeSH)

AND

Extracorporeal Membrane Oxygenation (MeSH)
OR
ECMO (non-MeSH)
OR
Rewarming (MeSH)
OR
Surface rewarming (non-MeSH)
OR
Spontaneous rewarming (non-MeSH)
OR
Patient rewarming (non-MeSH)
OR
Heart-lung machine (MeSH)
OR
Cardiopulmonary Resuscitation (MeSH)

Treatment of accidental hypothermia

- Think in «boxes»:

Hypothermia (MeSH)
OR
Accidental hypothermia (non-Mesh)
OR
Cold Temperature (MeSH)
OR
Cold exposure (MeSH)
OR
Body Temperature (MeSH)
OR
Core temperature (non-MeSH)

AND

Extracorporeal Membrane Oxygenation (MeSH)
OR
Extracorporeal circulation
OR
ECMO (non-MeSH)
OR
Rewarming (MeSH)
OR
Surface rewarming (non-MeSH)
OR
Spontaneous rewarming (non-MeSH)
OR
Patient rewarming (non-MeSH)
OR
Heart-lung machine (MeSH)
OR
Cardiopulmonary Resuscitation (MeSH)
OR
CPR
OR
Cardiac arrest
OR
Invasive rewarming
OR
CPB
OR
Cardiopulmonary bypass
OR
Hypothermic cardiac arrest
OR
Renal replacement therapy
OR
Renal replacement machines
OR
Dialysis maschines

AND

Accidents (MeSH)
OR
Avalanches (MeSH)
OR
Disasters (MeSH)
OR
Mass Casualty Incidents (MeSH)
OR
Emergencies (MeSH)
OR
Accidents, Aviation (MeSH)
OR
Warfare (MeSH)
OR
major accidents (non-MeSH)
OR
major incident (non-MeSH)
OR
Drowning
OR
Near-drowning

Building a decent search is a process

"Developing a search strategy is an iterative process in which the terms that are used are modified, based on what has already been retrieved."

"There are diminishing returns for search efforts; after a certain stage, each additional unit of time invested in searching returns fewer references that are relevant to the review. "

(Higgins & Green, 2011, Section 6.4.4, our emphasis).

Database selection

Talk to the library!

Med/health essentials:
Cochrane library (Wiley)
Medline (Ovid)
Embase (Ovid)
PsycINFO (Ovid)
CINAHL (EBSCO)

Cross disciplinary:
Google Scholar
Scopus (Elsevier)
Web of Science (Clarivate)

And many more.....

How to find the keywords?

1. Use sources you already have, or that you find in intuitive searches.
    a. They must be the kind of sources you want to capture.
    b. Look them up in the database of your choice and make a note of how they are indexed.
2. Use the database interface to find subject headings and entry terms.
3. Mine the brains of experts.

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