Finding right or wrong – a workshop in information literacy in research

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Agenda

1. Introduction
2. Information literacy
   Discussion
3. Defining the topic
4. Finding search terms
   Task 1
5. Search for articles in databases
   Task 2-4
6. Source criticism and evaluating sources
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Start your computer or take up your mobile phone!
Introduction

Information
Knowledge in general.

Misinformation
Wrong or misleading information. Misinformation is false or inaccurate information—getting the facts wrong.

Disinformation
Disinformation is spreading false information with the intention to mislead, for example with a political, economical or scientific purpose.
Misinformation and disinformation is false or inaccurate information—getting the facts wrong. Disinformation is false information which is deliberately intended to mislead—intentionally making the misstating facts.

The spread of misinformation and disinformation has affected our ability to improve public health, address climate change, maintain a stable democracy, and more. By providing valuable insight into how and why we are likely to believe misinformation and disinformation, psychological science can inform how we protect ourselves against its ill effects.
To be information literate, a person must be able to recognize when information is needed, and have the ability to locate, evaluate and use effectively the needed information.

(American Library Association, 1989)
Over to you!

Discuss in pairs:

• How can information contribute to economical, ecological or societal sustainable development?

• What can happen if we use misinformation or desinformation as information?
The aim of this workshop is to improve your skills in searching and evaluating scientific information.
Timeline – searching and evaluating information

1. Define topic & search terms
2. Choose database
3. Use search technique & search
4. Choose publications
5. Evaluate
6. Repeat your searches in many databases!
Defining the topic

The entire process of writing a report, a thesis or a manuscript starts by selecting a topic to work on.

It is important that you find an aspect of your topic and your own niche. Make the topic “your own”.

Example

*How does diet influence haemoglobin in the blood?*

Richard Matthews [CC BY (https://creativecommons.org/licenses/by/2.0)]
Finding search terms

Identify the central aspects of the issue, taking your question or task as a starting point. Find out which terms and concepts are used within your subject area, for example using your course literature. In most databases, you will need to search in English.

Think about synonyms for your search terms. Things can usually be expressed in different ways, and alternative search terms will need to be identified in order to find more hits and cover the subject area. If you get too many hits you will need to restrict your search, for example by adding search terms or using more specific search terms. If you enter too many search terms to begin with, this can result in too few hits.
Thesaurus and indexed keywords

A thesaurus is a controlled (defined) and hierarchically-organized vocabulary. It is used for indexing, cataloging, and when searching for information in databases. Some databases have a thesaurus.

Many databases have listed indexed keywords (from a thesaurus) in the entries of publications.

**Databases**
- Medical Subject Headings (MeSH)
- PubMed & Medline EBSCO
- Medline Ovid
- PsycINFO
- ERIC & ERIC EBSCO
- Academic Search Premier

**Controlled vocabulary/indexed keywords**
- MeSH
- Subject Heading/MeSH Subject Headings
- Subject Heading/Subject Headings
- Thesaurus/Descriptors
- Subject Terms

Scopus imports indexed keywords from other databases.

Controlled vocabulary can be used as terms or phrases (""") when searching in databases.
Example: MeSH - NCBI

MeSH

MeSH - hemoglobin

MeSH (Medical Subject Headings) is the NLM controlled vocabulary thesaurus used for indexing articles for PubMed.

Using MeSH

Help
Tutorials

More Resources

E-Utilities
NLM MeSH Homepage

Home - MeSH - NCBI (nih.gov)
Example: MeSH - NCBI
Task 1


• Search for relevant MeSH terms

• Click on the relevant MeSH terms in the hit list

• Try to find ”general” or ”superior” MeSH terms

• Try to find ”specific” or ”subordinate” MeSH terms
How to search for articles in databases

- Access the database from the website of your university library.
- Search in databases by using relevant terms and/or synonyms for terms.
- Check spellings of terms, e.g. analyse/analyze, colour/color, behaviour/behavior
- Check singular or plural versions of the terms, e.g. child/children, woman/women
- Filter the hit list, e.g. with respect to year or publication type.
- Do not apply limits like "Linked Full Text" when searching databases. This reduces the number of documents found to less than the actual number of available documents.
- Choose relevant publications.
- Make a new search by ”reusing” indexed terms/keywords you find in articles.
- Use the reference list of publications to find additional relevant references.
Examples of open databases – no login required

- Directory of Open Access Journals (DOAJ)
- ERIC
- Medical Subject Headings (MeSH)
- PubMed
Search technique

Using Boolean operators
Combine search terms with AND, OR, NOT

- Search term 1
- Search term 2

Diet AND Hemoglobin
13395 hits in PubMed 230620

Diet OR Hemoglobin
> 850 000 hits in PubMed 230620

(Diet AND Hemoglobin) NOT Murine
11525 hits in PubMed 230620
Search technique

The following works in most databases:

• Use brackets and the Boolean operator OR to create search blocks.
  e.g. (haemoglobin OR hemoglobin)

• Use phrase search “…”
  e.g. “oxygen binding”

  \textit{Note! Exact phrase in Scopus: \{...\}}

• Use truncation for searching different variants of words. *
  e.g. disease* = disease, diseases, ...

  \textit{Note! Search by using truncation does not work well in PubMed.}

• The Boolean operators AND, NOT to combine search terms and/or search blocks.
  e.g. (haemoglobin OR hemoglobin) AND (child OR children)

  \textit{Note! Boolean operators in Scopus: AND, OR, AND NOT}
Example: PubMed

Using filters
In many databases search terms can be combined by advanced searching in different fields.
Example: PubMed

PubMed

Iron deficiency anemia and glucose metabolism
Ashraf T Soliman, Vincenzo De Sanctis, Mohamed Yassin, Nada Soliman
Affiliations + expand
PMID: 28467345
PMCID: PMC6166102
doi:10.23736/sbm.v88i1.6049

Abstract
Iron deficiency anemia (IDA) is a global public health problem affecting both developing and developed countries with major consequences for human health as well as social and economic development. It occurs at all stages of the life cycle, but is more prevalent in pregnant women and young children. IDA appears to be more common in diabetic patients compared to non-diabetic population. Iron deficiency (ID) and IDA can impair glucose homeostasis in animals and human and may negatively affect glycemic control and predispose to more complications in diabetic patients. On the other hand, diabetes and its complications are associated with anemia and its correction improves diabetes control and may prevent or delay the occurrence of complications. Physicians treating this form of anemia should be aware of its negative effect on glycemic control in normal and diabetic patients both type 1 and type 2. They should prevent ID and treat early all those with IDA. This brief review aims to enlighten the different effects of IDA on glucose metabolism in normal and diabetic patients.

Keywords: Iron, iron deficiency anemia (IDA), glycated hemoglobin (HbA1c), insulin, glycemic control; diabetes type 1 and type 2.

Similar articles
Increased Levels of Glycated Hemoglobin A1c and Iron Deficiency Anemia: A Review.

6/30/2023
Example: PubMed
Task 2


2. Click on ”Advanced”

3. Choose ”All fields”, enter a search term and make a search. How many hits did you get?

4. Choose ”Title/Abstract, enter the same search term as in 3 and make a search. How many hits did you get?

5. Do the number of hits differ in 3 and 4? Why?
Task 3

2. Click on “Advanced”
3. Create search blocks, e.g.
   
   (haemoglobin OR hemoglobin)
   (analyse OR analyze)

4. Search each search block. How many hits did you get?
5. Combine the search blocks, e.g.
   
   (haemoglobin OR hemoglobin) AND (analyse OR analyze)

6. Search the combined search blocks. How many hits did you get?
7. Is it possible to filter your hit list further? How?
Task 4


2. Choose a search from the list to the left, e.g. public health
   Make a search with both words. How many hits did you get?

3. Combine the search terms within the phrase with **AND**, e.g.
   public AND health. Make a new search. How many hits did you get?
   Why does it differ?

4. Use citation marks around the phrase, e.g. ”public health” and make a new search. How many hits did you get? Why does it differ?

5. Choose a relevant article from the hit list.

6. Keep the entry window of the article open and download the fulltext of the article.

**Combine search terms**, e.g. sustainable development
public health
artificial intelligence
machine learning
real-time PCR

**Phrase searching**
Search terms that belong to each other can be considered a phrase.
**Usually 2-4 search terms.**
A phrase in this context does not normally contain connecting words (or, of, the, in...) or verbs.
Source criticism

When reliability and usefulness are to be evaluated, it is wise to ask some questions about the document.

- **Source of information**  
  Is the source reliable?

- **Publisher**  
  Is the publisher reliable?

- **Author and affiliation**  
  Who has made the study?

- **Content**  
  Is the design and results of the study reliable?  
  What does other people in the field say?

- **Funding**  
  Has someone ordered the study that have a specific interest?

- **Date of publication**  
  Are the methods and results still relevant?
Source criticism

Also:

• Which databases or search tools did you use?
• Are the databases scientific?
• Are the hit lists reliable?

Compare the information to your own knowledge!
Peer review / refereed articles

Research results are often published in articles in scientific journals, which provide explicit guidelines for what kind of research is published in the particular journal, and how submitted manuscripts are reviewed by experts.

This is usually called **peer review** or **refereeing**.

Information about peer review of journals can be found in the **Ulrichsweb** database (not open, but maybe accessible through your library).
Peer review / refereed articles
Peer review / refereed articles
Task 5

- Read the entry of the article from task 4. Do you find indexed MeSH terms, (author) keywords and the number of citations of the article?

- Are the indexed MeSH terms and the (author) keywords relevant for your topic?

- Use the cite function and generate a reference according to APA format.

- Read the full text version of the article briefly. What source critical questions do you use when you read it?

- Do you find the article reliable? Or do you find it controversial? Why?

- Would you recommend the article?
Task 6

Discuss in pairs:

• How do you evaluate your sources?

• Do you use any tools for evaluating sources? Which tools do you use and why?

• Are there other tools that you would like to use for evaluating sources?

• Have you been in contact with your library about evaluating sources?
Example: Bibliometric tools

Information about journals, e.g.
- Journal Citation Reports (JCR)
- Web of Science
- Ulrichsweb

Information about articles, e.g.
- Scopus
- Web of Science
- PubMed

Information about authors and funding, e.g.
- Scopus
- Web of Science
"The only thing that you absolutely have to know, is the location of the library."

Albert Einstein
Thank you

Maria Wickenberg
maria.wickenberg@his.se
Librarian, University of Skövde
1. Basic search strategies

Truncation
Truncation is a search technique that increases the results, and which allows you to search using different endings of words by putting an asterisk after the word stem or the first part of the word. Some databases use other symbols for truncation; if you are uncertain, look at the guidelines in the databases.

An example of truncation with an asterisk: learn* This will generate learning, learner, learners etc.

Searching for a phrase
Another search technique is phrase searching. Phrase searching will create fewer but more relevant hits. With phrase searching you will retrieve documents with the precise word order and not the specific words individually spread out in the text.

An example of phrase searching: “public health”
2. Basic search strategies

Searching using Boolean Logic
The Boolean operators are AND, OR and NOT. They are useful when you want to combine different search terms or concepts. In certain Swedish databases, the operators OCH, ELLER and INTE are used.

AND is used to combine two or more search terms. In many databases AND is standard; if you do not include an operator, the database will search with AND between the search terms. The more search terms with AND between them, the fewer hits you will get.

An example of a search with AND: child AND diabetes

OR between the search terms will generate hits where both or only one word exists. If you search with OR then the number of hits will increase. The OR-operator is useful when you search with various synonyms.

An example of a search with OR: student OR pupil
3. Basic search strategies

When various commands are combined, it is important to consider the order in which they should apply. This can often be regulated with the help of brackets. Here follow some usual examples where AND is the primary operator which combines searches in which the OR operator is included:

Diabetes AND (children OR adolescents OR teenagers)

NOT excludes hits from the search results. In which case, you type NOT before the term you do not want to be included in the search results.

There are exceptions concerning how the Boolean operators work, for example, AND NOT are used in Scopus instead of NOT. In the guidelines in the databases, you can read more about how the Boolean operators are used in each database.

An example of a search with NOT: cats NOT dogs

It is a good idea to type the Boolean operators using capital letters for clarity and readability.
Scientific articles

When you do a literature search you will find different types of documents. You will find scientific articles and non-scientific documents but also maybe scientific documents in various stages of the publishing process. Sometimes different journals can use different names for the same type of material. If you are uncertain, go to the journal’s website for more information. You can also contact the library or your teacher to get more information.

**Original articles** (original articles, research articles, empirical articles, research papers) comprise empirical studies that give an account of the results of new research for the first time.

**Review articles** do not report the results of a study of the authors. A review articles describes, analyses, summarises and evaluates published research within a limited field of research. There are various types of review articles with a varying degree of systematic searching, for example, literature review, systematic review, scoping review, meta-synthesis or meta-analysis. A systematic review is a comprehensive survey that is based on a carefully formulated protocol.
Articles in various stages of the publishing process

Different versions of one and the same article can be found; this is because they can become available online during different stages of the publishing process. There are various labels for these articles depending on how far they have proceeded in the process.

**Preprints** are articles which have not yet been peer reviewed (evaluated by subject experts). Do not use this type of article without checking with your teacher first. Another name that is used is author original manuscript.

**Postprints** are articles which have been peer reviewed but have not yet been given their graphic form. Sometimes they are called author manuscript, accepted article or accelerated article preview.

Articles that have been peer reviewed, have their graphic form and are published on the Internet but for which there is no decision regarding which journal issue they will be published in, can be called published ahead of print, earlycite article, article in progress, article in press, online ahead of print, early view and online first.