Question Development and Search Strategies

HNSC 4160

Bill Poluha
Agriculture and Food Sciences Librarian

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Goal

- Students will have clear understanding of the benefits of developing a research question and carrying out a literature search in support of that question.
Objectives

- Differentiate between background and foreground questions
- Choose appropriate resources to answer questions
- Develop search strategies and statements
- Learn to effectively search bibliographic databases
- Use a citation generator to create a reference list
Case

You are a registered dietician working within a multidisciplinary healthcare team for diabetic adults. You’ve been asked to provide the latest evidence on nutritional therapy for adults with diabetes.

Where do you begin?

What Are Research Questions?
Objective 1

Analyze

www.medicalwebsitedesign.info
Given a question formulated in preparation for a literature search, you will be able to differentiate background and foreground questions listing two characteristics specific to each type of question.
Ask the Right Question

“Paper or plastic?”

copyright The New Yorker
Types of Questions

- A two-model framework can be used to frame your question:
  - Background Questions
  - Foreground Questions

- This framework helps you to identify appropriate resources to better answer your question
Background Questions

- topics
- definitions
- facts

Background Questions

Examples:

*How fast can a cheetah run?*
*Who wrote the “Iliad”?*
*Why is the sky blue?*
Case

Begin your research on nutrition therapy for diabetic patients

Learning Activity

• Identify two background questions related to the case

Foreground Questions

- Research based
- Specific – narrowly focused
- Data is collected and analyzed to answer the question
Foreground Questions

Examples:

Among elderly, is ginseng effective in preventing upper respiratory tract infections compared to placebo?
Questions
Why is it Important to Match the Type of Question to Appropriate Information Resources?
Objective 2

Comprehension
Given a background or foreground question, you will be able to select the appropriate information resource using the Information Retrieval Model to answer the question, listing one resource specific to each type of question.
Background Resources

Monograph

2009 Influenza A/H1N1
Mass Vaccination Strategy:
A Multinational Comparison

Reference

Textbook

Review Article
Definition

Monograph:
A detailed written study of a single specialized topic (distinguished from general studies in which the topic is dealt with as part of a wider subject such as a textbook).

Oxford English Dictionary Online Edition
Definition

Review Article:
An article or book published after examination of published material on a subject. It may be comprehensive to various degrees and the time range of material scrutinized may be broad or narrow, but the reviews most often desired are reviews of the current literature.

Finding Background Resources

http://umanitoba.ca/libraries/
Case

Research on nutrition therapy for diabetic adults

Learning Activity

• Find a resource to answer your background questions

Background Resource Search

What type of resource did you find?

Which search resource did you use?

Did you encounter any difficulties searching?

Record your answers on the worksheet and write down any reflections you may have.
The test-negative design for estimating influenza vaccine effectiveness

Michael L. Jackson a,b, Jennifer C. Nelson a,b

a Group Health Research Institute, 1730 Minor Ave, Suite 1900, Seattle, WA, 98121-2448, United States
b Department of Biostatistics, School of Public Health and Community Medicine, University of Washington, F-005, Health Sciences Building, Box 357222, Seattle, WA, 98195-7222, United States

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Abstract
Objective: The test-negative design has emerged in recent years as the preferred method for estimating influenza vaccine effectiveness (VE) in observational studies. However, the methodological basis of this design has not been formally developed. Method: In this paper we develop the rationale and underlying assumptions of the test-negative study. Under the test-negative design for influenza VE, study subjects are all persons who seek care for an acute respiratory illness (ARI). All subjects are tested for influenza infection. Influenza VE is estimated from the ratio of the odds of vaccination among subjects testing positive for influenza to the odds of vaccination among subjects testing negative.

Results: With the assumptions that (a) the distribution of non-influenza causes of ARI does not vary by influenza vaccination status, and (b) VE does not vary by health care-seeking behavior, the VE estimate from the sample can be generalized to the full source population that gave rise to the study sample. Based on our derivation of this design, we show that test-negative studies of influenza VE can produce biased VE estimates if they include persons seeking care for ARI when influenza is not circulating or do not adjust for calendar time.

Conclusions: The test-negative design is less susceptible to bias due to misclassification of infection and its confounding by health care-seeking behavior, relative to traditional case-control or cohort studies. The cost of the test-negative design is the additional, difficult-to-test assumptions that incidence of non-influenza respiratory infections is similar between vaccinated and unvaccinated groups within any strata of care-seeking behavior, and that influenza VE does not vary across care-seeking strata.

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Summary
Background
No published meta-analyses have assessed efficacy and effectiveness of licensed influenza vaccines in the USA with sensitive and highly specific diagnostic tests to confirm influenza.

Methods
Foreground Resources

Databases

- Subject Specific
  - PubMed.gov
  - Embase

- Multidisciplinary
  - ISI Web of Science
  - Scopus
  - Google Scholar
Finding Foreground Resources

http://umanitoba.ca/libraries
Finding Foreground Resources

Within a **Subject Guide**, look for Articles or Databases by subject to access resources for foreground questions:
Case

Research on the nutrition therapy for diabetes

Learning Activity

• Would you use a multidisciplinary database for this case?
• Why? or Why not?
• Record your answers on your worksheet

Objective 3

Evaluation

http://4.bp.blogspot.com/-rQaFHd6NHJ0/TiJrXcsKavI/AAAAAAAAAA_U/urKiFcwF7Uk/s1600/evaluation.jpg
Given a foreground question, you will be able to justify the database(s) chosen to carry out the search using 3-5 database selection criteria.
Database Selection Criteria: Foreground Questions

- Journal Databases (also known as bibliographic databases)

- Subject
  - Specific (e.g. health sciences, physics, architecture)
  - Multidisciplinary (e.g. material science comprises physics, chemistry and engineering)

- Publisher of Database (authoritative)
  - Government (e.g. National Library of Medicine)
  - Academic/Industry organization (e.g. American Chemical Society)
Database Selection Criteria: Foreground Questions

- Time period coverage (current or older)
- Search tools
  - Boolean (logic) operators
  - Thesaurus (helps you find words/phrases for your search)
  - Limit options (time period, language, publication type, etc.)
  - Search set manipulation
  - Save search results to bibliographic management software
Pattern of Literature Publication and Retrieval

Original Work (Data Collection) 2014

Primary

Paper Published 2015
Electronic or Print

Indexed in Current Index to Statistics 2015

Secondary

Reviews 2016

Background

Tertiary

Textbooks 2017

Dictionaries, etc. 2018

Retrieval
Case

Research on nutrition therapy for diabetic adults

Learning Activity

• Find one database other than the databases listed under Foreground Resources to answer the case question
• Justify your choice with at least 3 database selection criteria

What is a Well-Formulated Search Statement?
Objective 4

Application
Given a question with two distinct concepts and associated synonyms within each concept, you will be able to apply appropriate Boolean operators to combine the concepts and synonyms into a well-formulated search statement.
Anatomy of a Question

Key Concepts: main topics or subjects in the question.

Synonyms: another word meaning the same thing
(e.g. synonym of dirt = earth, soil)

NOTE:
It’s important to think of all possible synonyms or related words to help achieve a comprehensive search retrieval.
Anatomy of a Question

Foreground Question:

Is physical therapy effective for treating lower back pain?

Key Concepts
## Example

<table>
<thead>
<tr>
<th>Concept A</th>
<th>Concept B</th>
<th>Concept C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Therapy</td>
<td>Lower Back Pain</td>
<td></td>
</tr>
<tr>
<td>Massage</td>
<td>Lower Back Ache</td>
<td></td>
</tr>
<tr>
<td>Hydrotherapy</td>
<td>Lumbar Pain</td>
<td></td>
</tr>
<tr>
<td>Acupressure</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Case

Research on nutrition therapy for diabetic adults

Learning Activity

• Identify key concepts and related synonyms

How Do We Combine?

- Boolean operators are a system of symbolic logic used to express the relationship between individual terms.

- We use these logical relationships all of the time, even in non-academic related topics.

- Even a search as simple as “Cats and Dogs”
Boolean Operators

- Use **OR** to connect synonymous or related terms.
- For example if searching “Cats” consider

  Persians **OR** Calicos **OR** Kittens
Boolean Operators

- Use **AND** to connect all terms that must occur in the information.

Retrieves only information that talks about **both** Cats **AND** Dogs.
Boolean Tutorials

Take these two brief tutorials located at Colorado State University Libraries:

Boolean:
http://lib.colostate.edu/tutorials/boolean_info.html

Advanced Boolean:
http://lib.colostate.edu/tutorials/booleanadv_info.html

Note: you will need Macromedia Flash v.5 installed on your computer
Search Principles

Well-Formulated Search Statement:
(physical therapy OR massage OR hydrotherapy OR acupressure) AND (lower back pain OR lower back ache OR lumbar pain)
Search Principles

Well-Formulated Search Statement Entered into a Database:

#1  physical therapy OR massage OR hydrotherapy OR acupressure

#2  lower back pain OR lower back ache OR lumbar pain

#3  #1 AND #2
Case

Research on nutrition therapy for diabetic adults

Learning Activity

• Combine the case key concepts and their synonyms with their appropriate Boolean operators to create a well-formulated search statement

PICO Method for Question Formulation

P – Patient, Problem, Population
I – Intervention
C – Comparison
O – Outcome
PICO Method for Question Formulation

P – Adults with Type 2 Diabetes
I – Low Carbohydrate diet
C – No Comparison
O – Glucose control

Question:
Among adults with type 2 diabetes, is a low carbohydrate diet compared to no dietary change effective in controlling blood glucose?
Contact

Should you have any questions, I can be reached at:

Bill Poluha
Librarian
Sciences and Technology Library
Machray Hall, University of Manitoba
Bill.Poluha@umanitoba.ca