Researching and Writing an Effective Background Section of a Research Paper

Lori Fitterling, MLS
University Librarian
Kansas City University of Medicine & Biosciences
lfitterling@kcumb.edu
Lori Fitterling, MLS
University Library Director
Kansas City University of Medicine & Biosciences

lfitterling@kcumb.edu

- Instructor of Medical Informatics and Information Literacy
- 26 years working in libraries
- 16 years working in medical libraries
Objectives

- Explain what should be included in the background section of a research paper
- Describe the process for conducting an effective literature review and why it is important in research methodology
- Identify strategies used in database searching
- Summarize ways to critically analyze results
- Recognize the written elements of the background section of a research paper
How to begin?
Clearly define research objectives/purpose

- Is topic researchable?
- What is the scope – too broad, too narrow?
- Is the topic timely, relevant, original or innovative?
- Who is your audience? Who will be interested in your research?
- What methods of analysis will you use?
- Has this research been done before?
- Identify preliminary information sources
Beginning the Research Process

- Select keywords, phrases to define your topic
- Look for relevant information on topic
- Repeat as often as necessary
- Enlist the help of librarians

1. Initial Question/Topic
2. Keywords/Search strategy
3. Search
4. Review/Evaluate Results
BACKGROUND SECTION

• Initial review and introduction
• Relevant information
• History
• Foundation for scientific inquiry
• Research methodology
• Thorough, unbiased, strong

Purpose is to introduce and support the validity of the research study
Background Section Must Have’s

- Introductory thesis statement, research question, hypothesis
- Statement of relevance of study
- Specific aims and research objectives
- Summary of current research
- History of past research, noting problems with previous studies
- Key issues and significance of the research
- Conclusive statement
Good research design begins with a good Literature Review

“Failure to conduct a thorough, accurate, and up-to-date literature review identifying an important problem and placing the study in context is consistently identified as one of the top reasons for rejection.”

LITERATURE REVIEW

- Discover what has been published on a topic by accredited scholars and researchers
- Organize results and define exclusion criteria
- Synthesize results
- Note controversial findings
- Summarize
Trying to find out everything you can about your topic can be daunting.
Critical SKILLS

Information Seeking
- Search efficiently
- Know what search results mean

Critical Appraisal
- Assess trustworthiness
- Assess relevance
Searching for Information

- Primary literature
- Secondary literature
- Print/electronic
- Books, Journals
- Scholarly, peer-reviewed, indexed
- Grey literature
- Mainstream
- Social media
Looking for evidence

- Primary Studies, unfiltered
  - Clinical trials
  - Randomized Controlled Trials
  - Multicenter studies
- Secondary, pre-appraised, or filtered
  - Reviews
  - Meta-analyses

https://commons.wikimedia.org/wiki/File:Research_design_and_evidence.svg
https://academicguides.waldenu.edu/healthevidence/evidencepyramid
The Search

• Select databases
• Keywords, phrases, indexed terms; break topic into specific concepts
• Create a search strategy
• Read the article, more than just the abstract
• Look at the article references
• Utilize exclusion criteria to create a reference list
• Refine and narrow search and repeat
Search Strategy

Use **Boolean Operators** to broaden or narrow search: **AND, OR, NOT**

Set filters, limits

- Article/publication type
- Publication dates
- Species
- Language
- Sex
- Subject
- Ages

**Example search:**

CT scan AND head trauma searched as Keywords in PubMed

### Compile the Results – Example

<table>
<thead>
<tr>
<th>Selected Studies or Highly Relevant Reviews</th>
<th>Study Design</th>
<th>Cancer Type</th>
<th>Content/Theme</th>
<th>Results/Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray et al.³ 2012</td>
<td>Prospective/quantitative</td>
<td>Lung, CRC, breast (n=69)</td>
<td>Patient attitudes about personalized medicine and genetic testing</td>
<td>1) Greater than 50% didn’t know or misunderstand the term; 2) Reluctance to undergo full genome sequencing (62%)</td>
</tr>
<tr>
<td>Thorne et al.¹² 2013</td>
<td>Prospective/quantitative</td>
<td>Metastatic malignancies (n=15)</td>
<td>Communication challenges in era of novel therapeutics</td>
<td>1) Changing “landscape” of communication</td>
</tr>
<tr>
<td>Cometta et al.⁹ 2013</td>
<td>Review</td>
<td>Variable</td>
<td>Incongruence of term “personalized”</td>
<td>1) Threat to spiritual/ psychological aspect of care</td>
</tr>
<tr>
<td>Shun et al.¹¹ 2012</td>
<td>Prospective/quantitative</td>
<td>HCC receiving TACE treatments (n=89)</td>
<td>Psychologic distress and QOL (SDS, HADS, SF-12)</td>
<td>1) Fatigue most distressful; 2) QOL improved after discharge</td>
</tr>
<tr>
<td>Caparon et al.¹² 2004</td>
<td>Prospective/quantitative</td>
<td>RCC or malignant melanoma (n=32)</td>
<td>Role of subclinical mood symptoms in predicting clinical depression with cytokine therapy</td>
<td>1) Depressive symptoms predicted by baseline emotional symptoms, sleep disturbance, and low social support</td>
</tr>
<tr>
<td>Rouanne et al.¹¹ 2013</td>
<td>Prospective/quantitative</td>
<td>Advanced or metastatic cancer refractory to classic lines of chemotherapy on phase 1 trials (n=63)</td>
<td>Effect of phase 1 targeted agents on HRQOL, depression, and sexual function</td>
<td>1) Preserved emotional and physical domains, whereas sexual activity declined in both sexes</td>
</tr>
<tr>
<td>Peppercorn et al.¹¹ 2011</td>
<td>Position paper – ASCO special article</td>
<td>None</td>
<td>Communication and decision making for patients with advanced cancer</td>
<td>1) Goals for individualized care, barriers, and possible strategies</td>
</tr>
<tr>
<td>Garcia et al.¹⁰ 2007</td>
<td>Review/position paper</td>
<td>None</td>
<td>Implementation of PROs for clinical trials</td>
<td>1) Outline of PROMIS methods for developing PRO measures</td>
</tr>
<tr>
<td>Viele.¹³ 2007</td>
<td>Review</td>
<td>Patients receiving oral chemotherapy</td>
<td>Challenges to managing oral chemotherapy</td>
<td>1) Role of healthcare practitioners in educating patients about side effects and assessing adherence</td>
</tr>
<tr>
<td>Von Goed et al.¹⁰ 2003</td>
<td>Review</td>
<td>Patients receiving interferon alpha (melanoma, CML, RCC, MM)</td>
<td>Neuropsychiatric effects of interferon alpha</td>
<td>1) An evaluation of evidence of psychiatric depressive effects of interferon alpha</td>
</tr>
</tbody>
</table>

Literature Search Diagram – Example

1,173 citations identified by MEDLINE literature search:
- Research priority search 1,038
- VOI search 135

9 duplicates removed

73 other relevant citations included from manual searching

1,237 screened at the title/abstract level

718 excluded

519 screened at the full-text level

Excluded:
- Not research prioritization (83)
- No formal framework/process (136)
- Description of framework/process only (83)
- Unable to obtain (3)

214 abstracted


Copyright Notice
NCBI Bookshelf. A service of the National Library of Medicine, National Institutes of Health.
DATABASE SEARCHING
What are your resources?

- Libraries – access to databases, reference books, E-books, print books, E-journals, print journals
- Social media websites, i.e. ResearchGate
- Faculty, Clinicians, researchers
The World of Medical Databases

NO ONE DATABASE WILL HAVE ALL OF THE INFORMATION THAT YOU NEED FOR YOUR RESEARCH

- MEDLINE/PubMed
- Clinical Key
- Web of Science
- Scopus
- Science Direct
- EBSCO Academic Search Elite
- Google Scholar
- CINAHL
- UpToDate
- DynaMed Plus
- Access Medicine
- TRIP
Database searching

• Choose the database
• Choose search terms
• Create search strategy using Boolean operators
• Apply limits
• Use Advanced Search features

National Library of Medicine -- 28 million bibliographic records
Organized by MeSH – MEDICAL SUBJECT HEADINGS

- MeSH organized in “trees”
- Indexed Articles
- Automatic Term Mapping
- MeSH Major Topic

- 4 Types of MeSH vocabulary terms:
  - Headings
  - Subheadings
  - Supplementary Concept Records
  - Publication Characteristics (or Types)
Create a search strategy using MeSH

- Select MeSH
- Type in a term
- Click on the term
- Select Subheadings
Create a search strategy in PubMed

- Click to add it to your search builder
- Add more terms or search PubMed
- Look at results
Google Scholar

Meta-crawler search engine

Indexes scholarly full text articles and other publications
Grey Literature

• **Grey literature** (or gray literature) are materials and research produced by organizations outside of the traditional commercial or academic publishing and distribution channels. 

• Publications types

• Examples of grey literature: conference abstracts, presentations, proceedings, meeting minutes, regulatory data, unpublished trial data, government publications, reports (such as white papers, working papers, internal documentation), dissertations/theses, patents, and policies and procedures.
Grey Literature

Recently revised and updated, CADTH’s free online resource for grey literature searching - Grey matters: a practical search tool for evidence-based medicine is now available.

- CADTH website: https://www.cadth.ca/grey-matters
CRITICALLY ANALYZE SEARCH RESULTS
Checklist to evaluate published studies

Critically appraise the evidence for its validity, impact, and applicability

- Is it legitimate?
- Is it important?
- Can it help?

* Did the study address a focused question?
* Did the study use valid methods?
* What were the results?
* Will the results help me in caring for my patients?
Consider

• Study population
  – Representative sampling of target population
  – Randomized, non-biased
  – Informed consent obtained

• Data collection methods
  – Valid data collection methods
  – Valid instrument

• Study design
  – Reproducible
  – Research methodology valid for study

• Results
  – Variables in results accounted for
  – Results analyzed
  – Future considerations
Tools

- CASP -- https://casp-uk.net/

- JAMA Evidence Critical Appraisal Worksheets
ELEMENTS OF THE BACKGROUND SECTION
Elements of the Background Section

- Thesis statement
- Research objectives
- Summaries of previous studies
- Conclusive statement
Checklist

✓ Thesis statement, research question, hypothesis
✓ Specific aims of the research--objectives
✓ Authoritative information on topic; summaries of current research
✓ Relevant background information
✓ Key issues that clearly define the topic and are pertinent to the study – significance of the research
✓ Thorough evaluation of the topic
✓ Conclusive statement
Osteopathic manipulative treatment (OMT) has been broadly used to treat pain-related conditions as well as in premature and preterm newborns. Recent studies have demonstrated positive results of OMT in reducing length of stay and costs. However, no trials were carried out on pain in newborns. The aim of the present clinical trial is to explore the effectiveness of osteopathic treatment in reducing pain in a sample of preterm newborns.

Objectives: A three-arm single-blind placebo-controlled randomized controlled trial protocol has been developed to assess the effect of OMT administered to preterm newborns. The study is composed of two randomized groups and a control group, both treated, while the control group was not exposed to the intervention. At the end of the trial, all newborns will undergo a standardized measure to assess pain. The primary outcome measure will be the sum of pain measurement scales, while secondary outcomes will be measured by comparing the medical records of the newborns in the intervention group and the control group. Non-parametric analysis will be used for continuous variables, while categorical data will be compared using chi-square tests. The results of this study will be reported in a full report, including the number of participants in each arm, the type of pain measured, and the effect of OMT on pain reduction.

Methods: The study will be conducted at a single institution, and the sample size will be determined based on the expected effect size and the standard deviation of pain scores. The data will be analyzed using intention-to-treat analysis. The study will be registered on ClinicalTrials.gov (NCT02146061) on 25 May 2014.

Keywords: OMT, pain, newborn, outcome, randomized controlled trial


https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4362649/pdf/13063_2015_Article_615.pdf


Thank You