Health Sciences Literature make Easy: The Matrix Method

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Why are we here?

• Writing a paper for a class
• Background for a presentation or publication
• Dissertation or thesis
• Research proposal
Assignment

1. Conduct a thorough literature review of specific features of the built environment and physical activity (walking, bicycling, and active play in children).
Assignment

2. Review primary research and (if they exist) any meta-analyses; include only studies where the outcome is physical activity. Review separately cross-sectional studies and intervention studies.
Matrix Method: Overview

- Paper Trail
- Documents Section
- Review Matrix
- Synthesis
Paper Trail

• A record of lists and notes to keep track of what you have done as you complete the search.
  – Key words
  – Key sources
  – Electronic Bibliographic Databases
Paper Trail

- **Key Words:** Think of words that describe the topic.
- **Key Sources:** Names of reference books, journals, government documents,
- **Electronic Bibliographic Databases:** Medline, OVID, etc
- **Notes:** write down all authors, can be helpful in searching
SEARCHING

• CHOOSING A TOPIC
  – PHYSICAL ACTIVITY INTERVENTIONS

• REFINING THE TOPIC
  – WHO, WHAT, WHEN, WHERE, HOW

• SELECTING KEYWORDS
  – PHYSICAL ACTIVITY, PHYSICAL EDUCATION
  – INTERVENTIONS, PROGRAMS
  – SCHOOL, AFTER SCHOOL, PARKS, PLAYGROUNDS, COMMUNITY CENTERS, CHURCHES, URBAN, WORKPLACE
  – KIDS, ADULTS, SENIORS, MATERNAL, FAMILIES
  – REDUCE, INCREASE, IMPROVE, BARRIERS
  – OBESITY, DIABETES, CARDIOVASCULAR, MUSCULOSKELETAL
IDENTIFYING SOURCES

- BOOKS
- REFERENCE BOOKS
- JOURNAL ARTICLES
- DATA
- GUIDELINES
- SYSTEMATIC REVIEWS
- CONFERENCE PROCEEDINGS
- REVIEWS
DATABASE SEARCHING

Boolean (Basic) – AND, OR, NOT
DATABASE SEARCHING

Guided Search
Documents Section

• Select documents for further review
  – Review abstract
  – Skim the whole article
  – Download or photocopy the article
AVOIDING CHAOS

• INCLUSION — EXCLUSION
• ORGANIZING YOUR ARTICLES BY YEAR
• ORGANIZING YOUR REFERENCES
  — RefWorks
  — EndNote Web
  — EndNote
  — Reference Manager
  — Zotero
  — MS Word 2007
Creating the Review Matrix

• Organize the documents: chronologically, oldest to newest by year of publication
• Choosing the topics: set up electronically
• Abstract the documents: read each abstract one at a time in chronological order from oldest to most recent and record your notes in your review matrix
You probably feel like giving up...

• Consider:
  – Do you want to say something that is not true or that is outdated?
  – End up designing a study and writing a grant proposal for a study that has already been done?

IF NOT, YOU NEED TO OWN THE LITERATURE.
Review Matrix

• Rows: documents such as journal articles
• Columns: topics to abstract for each article
  – Column Topics (first three always the same)
    • Column 1: Author, Title, Name of journal
    • Column 2: Year of Publication
    • Column 3: Purpose of the paper or source document (research question)
Other column topics

• Read the documents
• List important issues: study design, data sources, sample size
• Add in other column topics: magnitude of effect
• Leave some blank columns too for things that might come up after reading your documents
Abstracting a paper

• Author’s purpose
• Methods: recreate in your head what they did
  – Sample size: trace the numbers from beginning to end to understand the response rate
  – How was data collected?
• Results: read the purpose again, did they answer the research question?
• Discussion: What are the strengths and weaknesses?
• References: check and see if you need to add some to your documents from their list
<table>
<thead>
<tr>
<th>Author, Title, Journal</th>
<th>Year Published</th>
<th>Purpose</th>
<th>Study Design</th>
<th>Outcome</th>
<th>Variables</th>
<th>Subjects</th>
<th>Subject Charac.</th>
<th>Data Sources</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sallis, et al The Association of School Environments with Youth Physical Activity AJPH</td>
<td>2001</td>
<td>assess school env characteristics with levels of student physical activity</td>
<td>cross sectional</td>
<td># of children engaged in mod to vig phys act / Ave park attendance</td>
<td>environmental variables: area type, area size, permanent improvements</td>
<td>24 schools, 1081 students</td>
<td>43% non white, 39% on free or reduced, 38% bused</td>
<td>SOPLAY used to observe students before and after school and at recess</td>
<td>sch environments with high levels of supervision and improvements stimulated girls and boys to be more active</td>
</tr>
</tbody>
</table>
Lagniappe...

• Learn who the researchers are
• Where is the research done
• Datasets they have in common
• Funding sources
• Basic references
Synthesis

• Critical analysis of the literature on a particular topic.
• Similarities and discrepancies in content, methods and results.
• Highlights what is missing- holes in the content area and the research methods
• Goal is to actually critically analyze the literature and write a synthesis.
Materials needed for Synthesis

• Completed review matrix:
  – Focus is now on the columns of the matrix to compare the studies
  – Think about underlying factors that might vary over time between studies

• Documents section
Steps for the Synthesis

• Define the purpose of the review
• Describe the search process
• Discuss the following
  – Issues: major reasons for this research
  – Methods: different research methods, study designs used to investigate the topic
  – Results: major findings
  – Missing or inadequate topics: what has not been covered adequately
  – Critical analysis of each of those above areas: weigh the strength of evidence presented
Use the Review Matrix

• Read each of the columns from top to bottom, look for themes.
  – Are these issues that appear, disappear and reappear over the years?
  – Have authors done their own reviews well?
  – Do studies build on each other or go off in several directions?
  – How does the body of research develop? (definition of the problem, associations of risk factors, to interventions?)
  – What holes and opportunities exist?
Update your review!

• You wrote the grant, waited a year for NIH to give you money, then what?
• A bunch of studies might have been published about your topic
• Stay on top of the literature
• Use Medline and Endnote to manage this easily