Systematic Review and Meta-Analysis

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Agenda

• A short history of academic publishing
• What is a literature review?
• What is systematic review (SR)?
• Why is SR important?
• Creating an SR protocol (an example)?
• What is meta-analysis (MA)?
• A brief demonstration of MA?
When do you think the first academic journal might have gotten published?

- Le Journal des Scœavans
- Philosophical Transactions of the Royal Society
- Medical Essays and Observations
What is a literature review?

Why do we review the literature?
A systematic review is a literature review that is designed to locate, appraise and synthesize the all available evidence relating to a specific research question in order to provide informative and evidence-based answers.
<table>
<thead>
<tr>
<th>Type of Systematic Review (Munn et al., 2018)</th>
<th>Goal</th>
<th>Research Question Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness</td>
<td>To evaluate the effectiveness of a certain treatment/practice in terms of its impact on outcomes</td>
<td>What is the effectiveness of Behavioral Therapy in reducing aggressive behaviors?</td>
</tr>
<tr>
<td>Meta-ethnography &amp; Meta-synthesis</td>
<td>To investigate the experience or meaningfulness of a particular phenomenon</td>
<td>What are the Post-Traumatic experiences of refugees, if any, after migrating to another country?</td>
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<tr>
<td>Prevalence and/or incidence</td>
<td>To determine the prevalence and/or incidence of a certain condition</td>
<td>What is the prevalence of suicide attempts that were reported to hospitals in Ankara?</td>
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<tr>
<td>Diagnostic Test Accuracy</td>
<td>To determine how well a diagnostic test works in terms of its sensitivity and specificity for a particular diagnosis</td>
<td>Can BDI distinguish individuals diagnosed with depression from those who did not receive a depression diagnosis?</td>
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<tr>
<td>Psychometric</td>
<td>To evaluate the psychometric properties of a certain test, normally to determine how the reliability and validity of a particular test or assessment.</td>
<td>What are the reliability, validity, interpretability, and sensitivity of self-control scales?</td>
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SYSTEMATIC REVIEW

Planning (PROSPERO)

Identifying Inclusion and Exclusion Criteria

Carry out Research

Applying Inclusion and Exclusion Criteria

Data Extraction

Quality Assessment

Boland et al., 2017
1. Planning the Systematic Review

- Background search (PROSPERO)
- Time
- Collaborators
- Tools and Organization
2. IDENTIFYING INCLUSION AND EXCLUSION CRITERIA

Finalize Research Question

Identify inclusion and exclusion criteria

Write a protocol
3. CARRYING OUT SEARCH

Library access is crucial

AND, OR, NOT

?, *, $
<table>
<thead>
<tr>
<th>Wildcard</th>
<th>Function</th>
<th>Example</th>
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<tbody>
<tr>
<td>?</td>
<td>Search for a part of a word</td>
<td>wom?n will find woman and women</td>
</tr>
<tr>
<td>*</td>
<td>Produce alternative words from the same root</td>
<td>psychiatr* = psychiatrist, psychiatry</td>
</tr>
<tr>
<td>$</td>
<td>Include a search term and its plurals</td>
<td>trial$ = trial and trials</td>
</tr>
</tbody>
</table>
4. **Applying Inclusion and Exclusion Criteria**

- Screening titles and abstracts
- Screening and selecting full-text papers
- Collect references and remove duplicates
5. DATA EXTRACTION

Advise to your advisor to identify relevant data

Extract relevant data (multiple researchers)
6. Quality Assessment

- The quality assessment tools will vary depending on the purpose and field of your SR.

- PRISMA can be used to ascertain the quality of the SR.
META-ANALYZ

MA is a quantitative analysis of multiple studies to yield a single value showing the effectiveness of a particular method.
Kaynakça


https://bmcmedresmethodol.biomedcentral.com/articles/10.1186/s12874-017-0468-4#ref-CR21