Planning a Successful Systematic Review

Health Sciences Library
Today’s Agenda

• Welcome
• Introduction to EBM and Systematic Reviews
• Systematic vs Other Reviews
• Steps in a Systematic Review
• Planning and writing your protocol
  • Question formation / PICO
  • Critical Appraisal
Activity
One

1. Have you ever worked on a systematic Review?

2. If you could do anything you wanted for a systematic review, what would it be?

24 33 83

http://www.mentimeter.com/
Welcome

Introduction to EBM and Systematic Reviews

Systematic vs Other Reviews

Steps in a Systematic Review

Planning and writing your protocol

Question formation / PICO

Critical Appraisal
Introduction to EBM

Evidence-Based Medicine

The Evidence-based Medicine Triad
Source: Florida State University, College of Medicine: http://med.fsu.edu/index.cfm?page=medicalinformatics.ebmTutorial
Systematic Reviews

Find, choose, analyze, and critique the quality of all the evidence for a research question that fits certain criteria with minimal bias.

The EBM Pyramid
Source: The University of Texas MD Anderson Cancer Center: http://www3.mdanderson.org/library/evidence-based/pyramid.html
Good systematic reviews have:

- A focused question
- Inclusion and exclusion criteria
- A clearly defined search strategy
- Study selection and assessment
- Synthesis of study results
- Analysis and limitations

A systematic review and meta-regression of the knowledge, practices, and training of restaurant and food service personnel toward food allergies and Celiac disease

https://tinyurl.com/yc56vkt4
A focused question

What do food workers know about food allergies?
Inclusion and exclusion criteria clearly stated

This analysis was only conducted for outcome subgroups comprising at least 10 studies
Synthesis of study results

Thirty-eight relevant studies were identified; most were conducted in the United States (50%) and focused on food allergies (90%). Significant variability was identified across studies for most outcomes. Participants generally had a higher knowledge, self-efficacy, and use of practices related to preparing and serving allergen-free meals compared to food allergy emergency response. Participants’ reported use of various risk prevention and response practices was generally low.
Limitations of study

Key knowledge and practice gaps were identified that could be targeted by future training programs. Research gaps were also identified, including a need for more experimental studies to evaluate food allergy and CD training interventions.
Where to find systematic reviews

- The Cochrane Database of Systematic Reviews (Cochrane Library)
- PubMed or Medline (limit publication type to Systematic Reviews or Meta-Analysis)
- The Campbell Collaboration
- The journal “Systematic Reviews”
- Joanna Briggs Institute (JBI)
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Steps in Preparing for a Systematic Review

1. Identify topic
2. Check to see if your review has been done
3. Assemble a team
4. Review the literature (pre-search)
5. Formulate your question (PICOT)
6. Set inclusion/ exclusion criteria
7. Write and submit a protocol
Is my topic unique?

Is someone else doing the same thing as I read this?

Activity: with your neighbour look to see if your ideal SRs duplicates other SRs (10 minutes)
Welcome to PROSPERO
International prospective register of systematic reviews

Register a review
Registering a review is quick and easy. Just follow these simple steps to register your review in PROSPERO

Search PROSPERO
Search for PROSPERO registrations by entering words in the record or the registration number below

https://www.crd.york.ac.uk/prospero/
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Protocols help plan methods and analysis
Protocols

PRISMA-P checklist

✓ Administrative information
✓ Introduction
✓ Methods
<table>
<thead>
<tr>
<th>Administrative information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title:</strong></td>
</tr>
<tr>
<td>Identification 1a</td>
</tr>
<tr>
<td>Update 1b</td>
</tr>
<tr>
<td>Registration 2</td>
</tr>
<tr>
<td><strong>Authors:</strong></td>
</tr>
<tr>
<td>Contact 3a</td>
</tr>
<tr>
<td>Contributions 3b</td>
</tr>
<tr>
<td>Amendments 4</td>
</tr>
<tr>
<td><strong>Support:</strong></td>
</tr>
<tr>
<td>Sources 5a</td>
</tr>
<tr>
<td>Sponsor 5b</td>
</tr>
<tr>
<td>Role of sponsor or funder 5c</td>
</tr>
</tbody>
</table>

**Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation**
*BMJ* 2015; 349 doi: http://dx.doi.org/10.1136/bmj.g7647 (Published 02 January 2015)
Introduction

<table>
<thead>
<tr>
<th>Rationale</th>
<th>6</th>
<th>Describe the rationale for the review in the context of what is already known</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objectives</td>
<td>7</td>
<td>Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)</td>
</tr>
</tbody>
</table>

Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation

*BMJ* 2015; 349 doi: http://dx.doi.org/10.1136/bmj.g7647 (Published 02 January 2015)
Search: the most important part of planning is finding a good, solid question that can be answered.
PICO

P: Patient/Population
I: Intervention
C: Comparison/Control
O: Outcome/s
T: Time

PICO

Intervention/Therapy:
In _______(P), what is the effect of ________(I) on ________(O) compared with ________(C) within ________(T)?

Prevention:
For ________(P) does the use of ________(I) reduce the future risk of ________(O) compared with ________(C)?

PICO Practice

How effective are helmets in preventing head injuries in contact sports?

P: Adults who play sports
I: Helmet use/Protective headgear
C: No helmet use
O: Prevention of head injuries
PICO Practice

How effective are helmets in preventing head injuries?

In adults who play contact sports, does the use of protective headgear reduce the risk of head injuries compared to not wearing a helmet or other head protection?
In female adolescents with hepatitis B, how does acetaminophen compared to ibuprofen affect liver function?

Are 30 to 50 year old women with high blood pressure at increased risk for myocardial infarction during the first year after hysterectomy?

How does the use of influenza vaccine compared to no vaccination influence the risk of patients 65 years and older developing pneumonia during flu season?
Systematic Review Team

• Main Author or Authors

• Three reviewers

• Librarian, or trained professional

• Statistician
team responsibilities
Author’s/Authors’ responsibilities in preparing for a SR

• Select topic
• Recruit team, with a minimum of three people
• Review Literature
• Formulate a Research Question
• Set inclusion/exclusion criteria
• Write and submit a protocol
"it is recommended that review authors seek guidance from a healthcare librarian or information specialist, where possible with experience of supporting systematic reviews" (Cochrane Handbook of Systematic Reviews, 6.3.1)

"Work with a librarian or other information specialist trained in performing systematic reviews to plan the search strategy" (Institute of Medicine Standards for Systematic Reviews, 3.1.1)
Role or the Statistician

Work with the author(s) to decide what kind of information/data will be collected, and how it will be interpreted.
So, what comes next?

1. Performing scoping searches, identifying question, and writing your protocol
2. Literature searching
3. Screening titles and abstracts
4. Obtaining papers
5. Selecting full text papers
6. Quality assessment
7. Data abstraction
8. Analysis and synthesis
9. Writing and edition

Doing a Systematic Review: a Student’s guide. A Boland, S. Beal and M.G. Cherry
Inclusion/Exclusion Criteria

**Case control studies** are studies in which patients who already have a specific condition are compared with people who do not have the condition.
Cohort studies identify a group of patients who are already taking a particular treatment or have an exposure, follow them forward over time, and then compare their outcomes with a similar group that has not been affected by the treatment or exposure being studied. Cohort studies are observational and not as reliable as randomized controlled studies, since the two groups may differ in ways other than in the variable under study.
Randomized controlled clinical trials are carefully planned experiments that introduce a treatment or exposure to study its effect on real patients. They include methodologies that reduce the potential for bias (randomization and blinding) and that allow for comparison between intervention groups and control (no intervention) groups. A randomized controlled trial is a planned experiment and can provide sound evidence of cause and effect.
Literature Searching
Systematic Searching

The use of amiodarone, lidocaine or magnesium in cardiac arrest

1. exp heart arrest/
2. cardiac arrest.tw.
3. cardiovascular arrest.tw.
4. heart arrest.tw.
5. cardiopulmonary arrest.tw.
6. cardio-pulmonary arrest.tw.
7. cardiopulmonary resuscitation.tw.
8. cardio-pulmonary resuscitation.tw.
9. CPR.tw.
10. exp Cardiopulmonary Resuscitation/
11. advanced cardiac life support.tw.
12. ACLS.tw.
13. Ventricular Fibrillation/
14. asystole.tw.
15. pulseless electrical activity.tw.
16. or/1-15
The use of amiodarone, lidocaine or magnesium in cardiac arrest

Database: Ovid MEDLINE(R) <1946 to May Week 5 2013>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <June 05, 2013> Search Strategy:

1 exp heart arrest/
2 cardiac arrest.tw.
3 cardiovascular arrest.tw.
4 heart arrest.tw.
5 cardiopulmonary arrest.tw.
6 cardio-pulmonary arrest.tw.
7 cardiopulmonary resuscitation.tw.
8 cardio-pulmonary resuscitation.tw.
9 CPR.tw.
10 exp Cardiopulmonary Resuscitation/
11 advanced cardiac life support.tw.
12 ACLS.tw.
13 Ventricular Fibrillation/
14 asystole.tw.
15 pulseless electrical activity.tw.
16 or/1-15
17 exp Amiodarone/
18 (aldarone or amidarone or amidodacore or amiodarone or amiobeta or amiocar or amiodacre or miodar or amiodarex or amiodaron or amiodarona or amiodarone or amiloamine or amiohexal or amiorit or amiodarone or amyodarone or ancaron or ancoron or angiodarona or angoron or aratic or arycor or atlanisil or braxan or cardinorm or cardionora or corbionax or cordarex or cordaron or cordarone or cordarone or coronox or coronov or daronal or diaron or eurythmic or forkren or hexarone or kendaron or kordaron or miodar or miodar or miodar or orctacrine or pacerone or procure or rhymarone or rytmarone or sedacoron or sedacron or tachydaron or trityr or trangorex).tw.
19 exp Lidocaine/
20 (lidocain or lidocaine or lignocaine or Xylocaine or Anestacaine or Lidopen, Xylocaine, Xylocard).tw.
21 exp Magnesium Sulfate/
22 exp Magnesium/
23 magnesium.tw.
24 or/17-23
25 16 and 24
26 randomized controlled trial.pt.
27 controlled clinical trial.pt.
28 randomized.ab.
29 placebo.ab.
30 drug therapy.fs.
31 randomly.ab.
32 trial.ab.
33 groups.ab.
34 or/26-33
35 25 and 34 RCT FILTER
36 exp animals/ not humans.sh.
37 35 not 36
38 limit 37 to (comment or editorial or letter)
39 37 not 38

Cochrane Highly Sensitive Search Strategy for identifying randomized trials in MEDLINE: sensitivity-maximizing version (2008 revision); Ovid format) from:
The use of amiodarone, lidocaine or magnesium in cardiac arrest

26 randomized controlled trial.pt.
27 controlled clinical trial.pt.
28 randomized.ab.
29 placebo.ab.
30 drug therapy.fs.
31 randomly.ab.
32 trial.ab.
33 groups.ab.
34 or/26-33 [RCT FILTER*]
35 25 and 34

36 exp animals/ not humans.sh.
37 35 not 36
38 limit 37 to (comment or editorial or letter)
39 37 not 38

Filters to Identify Study Types

- CADTH [https://tinyurl.com/ydchoerx/](https://tinyurl.com/ydchoerx/)
- HIRU (Health Information Research Unit)
  - [https://tinyurl.com/y7844v2j](https://tinyurl.com/y7844v2j)
- SIGN [https://tinyurl.com/y6vnqd9v/](https://tinyurl.com/y6vnqd9v/)
Grey Literature

- Research published outside of commercial publishing cycle
- Government reports, conference proceedings and more

Texture, Read a Book / Gordana Adamovic-Mladenovic / Creative Commons
Plan how you are going to manage your results

Declare who will screen the results
Managing & Screening Search Results

- EndNote
- DistillerSR
- Review Manager (RevMan)
- Covidence
- EPPI-Reviewer
- Rayyan
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Critical Appraisal

• Careful, thorough analysis of results

• Checking for bias
Critical Appraisal Tools

• CASP (Critical Appraisal Skills Programme)

• CEBM (Centre for Evidence Based Medicine)

• SIGN Critical Appraisal Checklists

Tool Users / Alan / Creative Commons
Thank you!

If you have further questions, please contact the Health Sciences Library:

(416) 864-5059

hslibrary@smh.ca
A systematic review and meta-regression of the knowledge, practices, and training of restaurant and food service personnel toward food Allergies and Celiac disease

Cochrane Database of Systematic Review

Prospero

CADTH Validated Filters for Searching for Systematic Reviews

HIRU (Health Information Research Unit)

SIGN (Scottish Intercollegiate Guidelines Network)