The epidemiology and quality of systematic reviews of health professional behaviour change interventions

Michelle Weir, Alain Mayhew, Jeremy Grimshaw, Dean Fergusson

CADTH Symposium
Ottawa, Ontario
April 7, 2009
Potential Conflicts of Interest

- Cochrane Effective Practice and Organisation of Care Group
- Canadian Agency for Drugs and Technologies in Health (CADTH)
Systematic Reviews

• Used to obtain an objective summary of a large amount of evidence

• Frequently the most cited reports, thus can have an influential role in the development of public and clinical health guidelines

• Can be of variable quality, depending on extent to which scientific review methods were used in their development to minimize error and bias
Professional Behaviour Change Interventions

• Barriers in translation of evidence into practice for health professionals
• Various approaches to changing professional behaviour
• With limited resources, implementation decisions need to maximize benefits and minimize costs
Systematic Reviews of Professional Behaviour Change Interventions

• Effective Practice and Organisation of Care (EPOC) Review Group
  – Professional, Financial, Organizational, Structural, Regulatory Interventions

• Rx for Change
  – Initially launched 2007
  – Updated in April 2009
Objective 1

• Determine the epidemiology of systematic reviews of professional behaviour change
  – What are the numbers of reviews being produced on professional behaviour change?
  – Where are systematic reviews of professional behaviour change interventions found (ie. journals, grey literature, Cochrane library)?
  – Are certain types of reviews cited more frequently in the literature?
  – What populations have been targeted for health professional behaviour change interventions?
Objective 2

• Assess the quality and methods of systematic reviews of professional behaviour change interventions
  – What methods have been used in systematic reviews of professional behaviour change?
  – How variable is the quality of systematic reviews of professional behaviour change? What is the prevalence of high-quality reviews?
  – Are there differences between Cochrane and non-Cochrane systematic reviews of professional behaviour change interventions?
  – Has the quality and methods of systematic reviews of professional behaviour change interventions changed over time?
Methods

• MEDLINE, EMBASE, DARE, Cochrane Database of Systematic Reviews
• Specific inclusion and exclusion criteria
• Duplicate screening, data extraction and quality assessment
• Qualitative and quantitative analyses
Methods: Quality of Systematic Reviews

• Currently more than 24 instruments to appraise the methodological quality of systematic reviews, but few have been developed systematically or validated empirically.

• In 2007, Shea et al. developed 11-item scale: AMSTAR (a measurement tool to assess the methodological quality of systematic reviews).
AMSTAR is a reliable and valid measurement tool to assess the methodological quality of systematic reviews

Beverley J. Shea\textsuperscript{a,b,c,\textasteriskcentered}, Candyce Hamel\textsuperscript{a}, George A. Wells\textsuperscript{d,e}, Lex M. Bouter\textsuperscript{b}, Elizabeth Kristjansson\textsuperscript{f}, Jeremy Grimshaw\textsuperscript{g}, David A. Henry\textsuperscript{h}, Maarten Boers\textsuperscript{c}

\textsuperscript{a}Community Information and Epidemiological Technologies (CIET), Institute of Population Health, Ottawa, Ontario, Canada  
\textsuperscript{b}Institute for Research in Extramural Medicine (EMGO Institute), VU University Medical Center, Amsterdam, The Netherlands  
\textsuperscript{c}Department of Clinical Epidemiology and Biostatistics, VU University Medical Center, Amsterdam, The Netherlands  
\textsuperscript{d}Ottawa Heart Institute, University of Ottawa, Ottawa, Ontario, Canada  
\textsuperscript{e}Department of Epidemiology and Community Medicine, University of Ottawa, Ottawa, Ontario, Canada  
\textsuperscript{f}Faculty of Social Sciences, School of Psychology, University of Ottawa, Ontario, Canada  
\textsuperscript{g}Clinical Epidemiology Program, Department of Medicine, Ottawa Health Research Institute, University of Ottawa, Ottawa, Ontario, Canada  
\textsuperscript{h}Institute for Clinical Evaluative Sciences, Toronto, Ontario, Canada

Accepted 29 October 2008

\textbf{Abstract}

\textbf{Objective:} Our purpose was to measure the agreement, reliability, construct validity, and feasibility of a measurement tool to assess systematic reviews (AMSTAR).
AMSTAR items

1. Was an 'a priori' design provided?
2. Was there duplicate study selection and data extraction?
3. Was a comprehensive literature search performed?
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?
5. Was a list of studies (included and excluded) provided?
6. Were the characteristics of the included studies provided?
AMSTAR items

7. Was the scientific quality of the included studies assessed and documented?
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?
9. Were the methods used to combine the findings of studies appropriate?
10. Was the likelihood of publication bias assessed?
11. Was the conflict of interest stated?
Results: General

• 188 systematic reviews on professional behaviour change interventions
  • Represent over 100 different journals
  • Ranged from 1 included study to over 250 included studies

• 1977-2008

• Majority published in USA, UK and Canada

• Educational meetings, educational materials, reminders, audit and feedback and multifaceted interventions were most frequently evaluated
Results: General

- Physicians most targeted group, with nurses second
- Type of publication:
  - Non-Cochrane journal (151)
  - Cochrane Database of Systematic Reviews (31)
  - Grey literature (7)
- Authors provided primarily descriptive analyses, with meta-analyses conducted in only 14% of reviews
Crude numbers of systematic reviews as publication types in MEDLINE, along with number of systematic reviews of professional behaviour change interventions, for years 1977-2008.
Citation Frequency Distribution for Professional Behaviour Change Systematic Reviews and Papers in the Life-Sciences

Times Cited

Percentage of All Publications

Professional behaviour change SRs vs All life science articles

Canadian Agency for Drugs and Technologies in Health

uOttawa
L'Université canadienne
Canada's university
Results: Quality

• Average AMSTAR Score = 4 (out of possible 11)
• Ranged from 0-9
• Certain items consistently scored ‘no’ across reviews
Average AMSTAR Score by Year, 1977-2008

Year


Total AMSTAR Score

0 1 2 3 4 5 6 7 8 9 10

Canadian Agency for Drugs and Technologies in Health

uOttawa
Quality:
Cochrane vs. Non-Cochrane

- 188 systematic reviews
  - 31 from Cochrane Database of Systematic Reviews
- Average AMSTAR Score = 4
- Average Non-Cochrane AMSTAR Score = 3.3
- Average Cochrane AMSTAR Score = 7.4
AMSTAR Item 1

Authors

Contribution of author(s)
MAOB, GJ, SR, DB and LF independently assessed study quality and completed data extraction. JO-G, DTK, and AO contributed to the statistical analyses. DTK designed the figures. All authors provided comments on the protocol or text of the review. MAOB, AO, NF, DD, RBH and EH contributed to the initial publication of the review.

Issue protocol first published
1996/2

Review first published
1997/4

Date of most recent amendment
14 November 2007

Date of most recent
20 August 2007
SUBSTANTIVE amendment

What’s New
In this updated review, we investigated whether different factors influence the effectiveness of educational outreach visits (EOVs). Similarly, we investigated whether adding another
# AMSTAR Item 5

## Characteristics of excluded studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Reason for exclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baker 2001</td>
<td>Could not disentangle the effects of educational outreach visits</td>
</tr>
<tr>
<td>Betz-Brown 2000</td>
<td>Visitor was part of the same organisation at the same site</td>
</tr>
<tr>
<td>Dietrich 1992</td>
<td>Not educational outreach</td>
</tr>
<tr>
<td>Dolovich 1999</td>
<td>Not professional practice</td>
</tr>
<tr>
<td>Hampshire 1999</td>
<td>No data in paper</td>
</tr>
<tr>
<td>Joseph 2004</td>
<td>Aim of study was organisational change</td>
</tr>
<tr>
<td>Katzelnick 2000</td>
<td>Not an educational outreach visit</td>
</tr>
<tr>
<td>O’Halloran 2004</td>
<td>Aim of study was organisational change</td>
</tr>
<tr>
<td>Ray 1985</td>
<td>Follow up to 1993 study</td>
</tr>
<tr>
<td>Ray 1986</td>
<td>Allocation to intervention was not randomised</td>
</tr>
<tr>
<td>Ray 1987</td>
<td>Allocation to intervention was not randomised</td>
</tr>
<tr>
<td>Ray 1993</td>
<td>Allocation to intervention was not randomised</td>
</tr>
<tr>
<td>Ross-Degnan 1996a</td>
<td>Allocation to intervention was not randomised</td>
</tr>
<tr>
<td>Schaffner 1983</td>
<td>Allocation to intervention was not randomised</td>
</tr>
<tr>
<td>Stergachis 1987</td>
<td>Visitor was part of the same organisation at the same site</td>
</tr>
<tr>
<td>Trap 2001</td>
<td>Not professional practice</td>
</tr>
</tbody>
</table>
Table 2: Methodologic quality and potential risks of bias of the 9 randomized controlled trials (RCTs) included in the systematic review

<table>
<thead>
<tr>
<th>Study</th>
<th>RCT type</th>
<th>Sponsor</th>
<th>Jadad score*</th>
<th>Allocation concealment</th>
<th>Intention-to-treat analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td>Randomization</td>
<td>Blinding</td>
</tr>
<tr>
<td>Still et al\textsuperscript{13}</td>
<td>Multicentre</td>
<td>Johnson and Johnson</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Gabriel et al\textsuperscript{10}</td>
<td>Single centre</td>
<td>Janssen-Cilag</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Corwin et al\textsuperscript{1}</td>
<td>Multicentre</td>
<td>Ortho-Biotech</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Van Iperen et al\textsuperscript{14}</td>
<td>Single centre</td>
<td>Janssen-Cilag</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Corwin et al\textsuperscript{15}</td>
<td>Multicentre</td>
<td>Ortho-Biotech</td>
<td>5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Georgopoulo\textsuperscript{13}</td>
<td>Multicentre</td>
<td>Janssen-Cilag</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Silver et al\textsuperscript{12}</td>
<td>Multicentre</td>
<td>Ortho-Biotech</td>
<td>5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Vincent et al\textsuperscript{16}</td>
<td>Multicentre</td>
<td>Janssen-Cilag</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Corwin et al\textsuperscript{17}</td>
<td>Multicentre</td>
<td>Ortho-Biotech</td>
<td>5</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

*The Jadad scale\textsuperscript{18} gives a score for methodologic quality based on the reported methods and description of randomization (0-2 points), blinding (0-2 points) and participant withdrawals (0-1 point). Possible scores vary from 0 to 5, with a score of 5 indicating high methodologic quality.
Conclusions

• Substantial increase in number of reviews
• Systematic reviews of professional behaviour change interventions are highly cited
• Quality is generally low
• Certain AMSTAR items rarely score a ‘yes’
• Raises the question of whether the number of reviews is warranted
Acknowledgements

• Beverly Shea
• Bill Leslie and CADTH team
• Julia Worswick and Ottawa EPOC team