Systematic reviews of quantitative and qualitative studies

Brenda Roe
Evidence-based Practice Research Centre
Faculty of Health
Edge Hill University

12 March 2013
Overview

Briefly look at approaches for evidence synthesis of quantitative and qualitative studies

Provide some examples of published systematic and integrative reviews

Methodological issues and developments
Quantitative approaches to evidence synthesis

Content analysis

Bayesian approaches  - cross design synthesis
   - meta-analysis
   - decision analysis

Qualitative comparative analysis using Boolean logic

Interpretive approaches to evidence synthesis

Used mainly for qualitative studies

Meta-synthesis
Meta-study
Qualitative meta-analysis

Comparative approaches - grounded theory
- case study

Translation based approaches – meta-ethnography

See Pope et al (2007), p72
Mixed approaches to synthesis of quantitative and qualitative studies/evidence

Integrative reviews

Thematic analysis - reflect directly main ideas/conclusions

Realist synthesis – testing causal/theories of change, what works?

Narrative synthesis

Combining separate syntheses: the EPPI approach

Meta narrative review

<table>
<thead>
<tr>
<th>Quantitative</th>
<th>Qualitative</th>
<th>Integrative (Quan and Qual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narrative review</td>
<td>Case survey method (Yin &amp; Heald 1975)</td>
<td>Integrative review (Kirkevold, 1997)</td>
</tr>
<tr>
<td>Meta-analysis (Glass et al 1981, Egger et al 1997)</td>
<td>Qualitative comparative analysis (Ragin 1987)</td>
<td></td>
</tr>
<tr>
<td>Cochrane review (1993)</td>
<td>- reciprocal translational synthesis</td>
<td></td>
</tr>
<tr>
<td><a href="http://www.cochrane.org/">http://www.cochrane.org/</a></td>
<td>- refutational synthesis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- lines-of- argument synthesis (Noblit &amp; Hare 1988)</td>
<td></td>
</tr>
</tbody>
</table>
Systematic reviews of quantitative and qualitative studies/evidence

Provide the broadest category of systematic review and can include empirical evidence from quantitative and qualitative studies as well as theoretical or ‘grey’ policy literature.

They incorporate the findings from a variety of research designs.

As they involve multiple methodological perspectives, they are more complex to undertake.

There is no widely accepted standard but developments in the methods of systematic reviews have contributed to their development.
Systematic reviews of quantitative and qualitative studies/evidence

These reviews aim to include quantitative and qualitative studies and may also incorporate other levels of evidence on a topic.

They are systematic and rigorous and have the potential to present a comprehensive context and evidence on a health or social care topic or concern. They do not just relate to evidence on effectiveness.

Due to their complexity the challenges relate to resources, expertise, rigour, transparency, synthesis and interpretation.

Evidence synthesis

Cochrane systematic reviews on bladder training and toileting programmes for the management of urinary incontinence in adults


**Habit retraining** - first published (Ostaszkiewicz et al 2004, updated 2010)

**Timed voiding** – first published (Ostaszkiewicz et al 2004, updated 2010)
### Populations and Interventions

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Included:</th>
<th>n =</th>
<th>Population Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bladder training</strong></td>
<td>12 trials</td>
<td>1473</td>
<td>mainly women</td>
<td>(Wallace et al 2009)</td>
</tr>
<tr>
<td><strong>Prompted voiding</strong></td>
<td>9 trials</td>
<td>674</td>
<td>elderly, mainly women</td>
<td>(Eustice et al 2009)</td>
</tr>
<tr>
<td><strong>Habit retraining</strong></td>
<td>4 trials</td>
<td>378</td>
<td>mainly women</td>
<td>(Ostaszkiewicz et al 2010)</td>
</tr>
<tr>
<td><strong>Timed voiding</strong></td>
<td>2 trials</td>
<td>298</td>
<td></td>
<td>(Ostaszkiewicz et al 2010)</td>
</tr>
</tbody>
</table>
Meta-study
Systematic review of bladder training and voiding programmes in adults: a synopsis of findings on theory, methods, data analysis and outcomes using meta-study techniques (Roe et al 2007 a,b)

To review the evidence base of bladder training, prompted voiding, habit retraining and timed voiding from systematic reviews and meta-study

To address definitions, historical and theoretical constructions, clinical effectiveness, resources, adherence, feasibility and sustainability

To identify gaps in evidence for these behavioural interventions

To identify and inform future research and current practice
Overview of the Evidence Base

Cochrane systematic reviews
BT (Wallace et al 2004); PV (Eustice et al 2002); HR and TV (Ostaszkiewicz et al 2004 a,b)

• Meta-study using review methods for qualitative studies to provide a synopsis and descriptive comparison and contrast

• Selection and appraisal of primary research
  Meta-theory
  Meta-method
  Meta-data analysis

Paterson et al 2001
Systematic review of respite care in the frail elderly (Shaw et al 2009)

Objectives: To assess effectiveness and cost effectiveness of breaks in care in improving well-being in informal carers of frail and disabled older people living in the community and to identify carer needs and barriers to uptake of respite services

Data sources: Major electronic databases were searched from the earliest possible date to April 2008

MEDLINE, EMBASE, PsychoInfo, AMED, ASSIA, IBSS CINAHL, Econolit, Social Care Online, Sociological Abstracts, Web of Science, Cochranes databases of reviews and trials (CDSR, CMR, CENTRAL, DARE). PubMed Cancer Citations, Scopus and databases of ongoing research (NRR, CRISP)
Review methods:
Selected studies were assessed and subjected to:

Extraction of numerical data for meta-analysis of quantitative studies (104 papers)

Extraction of text for thematic analysis of qualitative studies (70 papers)

Independent data extraction and quality appraisal by two reviewers was undertaken with cross check for consensus

Separate specifically designed data extraction and quality appraisal forms for quantitative or qualitative studies were used
Results: Quantitative synthesis

104 papers identified, 16 appropriate for meta-analysis

• Carer burden was reduced at 2-6 months’ follow up in single sample studies but not in RCTs and quasi-experimental studies

• Depression was reduced in RCTs in the short term and for home care but not for day care.

These effects were not significant in random-effects models.

There was a trend for longer interventions to have more positive effects than shorter interventions
Results: Quantitative synthesis

• There was no effect of respite on anxiety, but it had positive effects on morale and anger and hostility. Single group studies suggested that quality of life was worse after respite use.

• There were increased rates of institutionalisation after respite use; however, this does not establish a causal relationship as it may be a result of respite being provided late in the care giving career.
Results: Qualitative synthesis

70 papers identified for inclusion

Uptake of respite care was influenced by:

- carer attitudes to caring and respite provision
- the care giving relationship
- knowledge of, and availability of, services
- the acceptability to, and impact of respite care
- quality of respite care
- the appropriateness and flexibility of service provision

Respite should provide a mental break and not just a physical break.
Carers expressed needs for active information provision about services and support early in the care giving experience.
Conclusions:

There was some evidence to support respite having a positive effect on carers but the evidence was limited and weak.

There was a lack of good-quality larger trials and respite interventions were varied, often with poor descriptions of the characteristics of interventions and limited provision and uptake.

There was also a lack of economic analysis.

Implications for health care
Recommendations for research

Systematic reviews of the management of incontinence and promotion of continence in older people in care homes

Descriptive studies with UI as the primary outcome
(Roe et al 2011. JAN 67,2, 228-250)

Descriptive studies with factors associated with UI as primary focus
(Roe et al 2011. IJOPN 19 Dec 2011)

Intervention studies with UI as the primary outcome
(Flanagan et al 2012. Geriatr Gerontol Int. 12,4,600-11)

Intervention studies with factors associated with UI as primary focus
(Flanagan et al, under review)
Systematic reviews of the management of incontinence and promotion of continence in older people in care homes

- To identify empirical research for the management of incontinence, promotion of continence or maintenance of continence in older people in care homes

- Search conducted with no date limits up to 2009, then updated 2010

- Empirical studies that used quantitative or qualitative designs and methods that met inclusion criteria were included

- Standard techniques and methods for systematic reviews were used and descriptive narrative summary of designs, methods, findings and outcomes
Systematic reviews of the management of incontinence and promotion of continence in older people in care homes

Records identified from database search (n=181)
Records after duplicates removed (n=175)
Records and full text articles screened (n=174, 1 awaiting)

Full text articles assessed for eligibility (n=86 including 5 systematic reviews and 1 related paper to identify relevant studies)
Records and full text articles excluded with reasons (n=82)

Studies included in quality appraisal (86 to 68 primary studies)
Studies included in data extraction (n=42 intervention studies and 26 descriptive/observational studies)
Included studies

• **Descriptive studies**
  10 studies with UI as primary focus/outcome
  16 studies with associated factors/comorbidities or management approaches as primary focus/outcome

• **Intervention studies**
  33 studies with UI as primary outcome: of which 11 were RCTs
  9 studies with associated factors or management approaches as primary focus/outcome

Associated factors included economic findings, skin care, exercise and mobility studies, staff quality and prompted voiding adherence, patient and family preferences, promotion of continence by the management of dehydration and incontinence
Integrative reviews incorporating quan & qual studies using narrative synthesis


Both integrative reviews used a quality appraisal checklist adapted by Desborough et al from Bowling (2002). Staggers & Blaz also included assessment of threats to validity for experimental studies using Quality Assessment Informatics Instrument QUASII (Weir et al 2009)
Methodological procedures to reduce sources of error in integrative reviews

1. Literature search and sample selection
   Use multiple search strategies
   Evaluate quality of primary sources and effort in analysis

2. Data analysis
   Define coding procedures
   Use piloted data extraction form
   Have two independent reviewers extract data from primary sources
   Develop inclusion and exclusion criteria to avoid double counting
   Critique primary sources and include quality assessment of analysis
   Include all evidence from primary sources in data analysis
   Explore variability of findings, conflicts and rival hypotheses
Methodological procedures to reduce sources of error in integrative reviews

3. Conclusion drawing

Use systematic and objective methods
Use well-specified data extraction and analysis procedures

Margarete Sandelowski et al USA- NIH funded review

Mixed methods synthesis of research on childhood chronic conditions and family

Data extraction method that allows integration to preserve the context of findings and allows comparison with each other.

Lucas et al 2007. Worked examples of alternative methods for synthesis of qual & quan research in systematic reviews
http://www.biomedcentral.com/1471-2288/7/4

Cochrane qualitative research methods group
http://cqrmg.cochrane.org/
Core Library of Qualitative Synthesis
Resources for Conducting Qualitative Synthesis
Thank you

Any Questions?

Contact details:

Brenda Roe
Professor of Health Research
Evidence-based Practice Research Centre (EPRC)
Faculty of Health & Social Care
Edge Hill University

Email: brenda.roe@edgehill.ac.uk
Studies of Orthopaedic Surgeons at Work in NHS Hospitals