ESRC Research Methods Festival, St Catherine’s College Oxford, 30th June to 3rd July

Session 22: Systematic reviews (2)

Testing and building theories: mixed methods synthesis

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Synthesis methods

For effects of interventions
• Vote counting
• Statistical meta-analysis

For qualitative research
• Meta-ethnography (e.g. Noblit and Hare, 1988)
• Grounded formal theory (e.g. Kearney, 1998)
• Thematic synthesis (e.g. Thomas and Harden, 2007)

For diverse study types
• Bayesian synthesis (e.g. Jones et al., 2002)
• Meta-narrative synthesis (e.g. Greenhalgh et al. 2005)
• Realist synthesis (e.g. Pawson, 2006)
• Critical interpretive synthesis (e.g. Dixon-Woods et al., 2006)
• Mixed methods systematic reviews (e.g. Harden and Thomas, 2005)
Mixed methods systematic reviews

**Working definition**

- Combining the findings of ‘qualitative’ and ‘quantitative’ studies within a single systematic review, in order to address the same, overlapping or complementary review questions.
Mixed methods systematic reviews

• **Key principles:**
  – Transparency
  – Involve users
  – Avoiding bias
  – Awareness and acknowledgement of error (in primary studies and review process)

• **Methods of review adapted depending on study type under review**
  – e.g. Different methods of critical appraisal for trials and for qualitative research
  – e.g. Principles of qualitative data analysis are used to synthesis qualitative studies

• **Complementary view of qualitative and quantitative research**
  – Combining strengths of each
Mixed methods systematic reviews

- Three senses in which reviews are mixed methods

1. The types of studies included and hence the type of findings to be synthesised (i.e. ‘qualitative/ textual and quantitative/numerical)

2. The types of synthesis method used (e.g. statistical meta-analysis and qualitative synthesis)

3. The mode of analysis: theory testing AND theory building
A mixed methods review

Children and healthy eating: a systematic review of barriers and facilitators*

Review questions

What is known about the barriers to, and facilitators of, healthy eating amongst children?

Do interventions promote healthy eating amongst children?

What are children’s perspectives on healthy eating?

What are the implications of the above for intervention development?
**REVIEW PROCESS**

**Searching, screening and mapping**

Focus narrowed to ‘fruit & veg’

**Synthesis 1: Trials (n=33)**
1. Quality assessment
2. Data extraction
3. Statistical meta-analysis

**Synthesis 2: Qualitative studies (n=8)**
1. Quality assessment
2. Data extraction
3. Thematic synthesis

**Synthesis 3: Trials and Qualitative studies**
Methods for synthesis 1: ‘Quantitative’ (Trials)

Effect sizes from trials pooled using:
• Statistical meta-analysis
• Six different outcomes

Heterogeneity across studies explored via:
• Sub-group analysis
• Qualitative analysis of textual data from trials
### Findings for synthesis 1: ‘Quantitative’ (Trials)

<table>
<thead>
<tr>
<th>Item</th>
<th>Effect (CI)</th>
<th>Weight</th>
<th>Size</th>
</tr>
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<tr>
<td><strong>Fruit and vegetable intake: core set</strong></td>
<td></td>
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<tr>
<td>Anderson et al</td>
<td>0.46 (0.00, 0.92)</td>
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<td>11.7</td>
<td>1172</td>
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<td>Cullen (1997)</td>
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<td>Epstein et al (2001)</td>
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<td>Gortmaker et al (1999)</td>
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<tr>
<td>Henry et al (2001)</td>
<td>0.16 (-0.45, 0.77)</td>
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<td>Hopper et al (1996)</td>
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<tr>
<td>Parcel et al (1999)</td>
<td>-0.11 (-0.29, 0.08)</td>
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<td>Perry et al (1998)</td>
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<td>Reynolds et al (2000)</td>
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<tr>
<td></td>
<td>0.23 (0.11, 0.35)</td>
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</table>
Synthesis 2: thematic synthesis

Stage 1 and 2: Coding text and developing descriptive themes

Stage 3: Generating analytical themes
Data were author descriptions of study findings

Line-by-line coding applied to data

- 36 initial *descriptive codes* (e.g. *bad foods = nice; good foods = awful*)

Looked for similarities and differences among *descriptive codes* in order to group them

- 13 *descriptive themes* (e.g. ‘Perceptions of health benefits’)
as a legitimate use of their money and thought parents should buy this.

Children did not identify friends as an influence on their healthy eating

'Children were well aware of the pressures on them (to be healthy) and of the contradictions in their own behaviour, and knew that they did not always act on what they knew to be healthy: 'When they (the Apples project) come round, you think right, I'm going to get healthy now, but when you get home, you get somethin out of the fridge or something' (Boys, Year 6); 'At home I just nip into the biscuit tin.' (Boys year 5)’ p.74 - e.g. temptation 'All the things that are bad for you are nice, and all the things that are good for you are awful' (Boys, year 6) p.74 Problems with school dinners - 'But once you go down for the school dinners it's a different story, because you've got all your fattening foods' (Boys, Year 6) p.74 Some children reported throwing away foods they knew had been put in because they were 'good for you' and only ate the crisps and chocolate. Influence of advertising - reported keenness to emulate footballer Alan Shearer by eating at McDonalds 'My brother says we have to go to there because Alan Shearer has been there.' (Girls, year 5) 'People thing I want to be like Alan Shearer so I better go to MacDonalds.' (Boys, year 6) Children said that adverts made them 'feel hungry' and were particularly
Descriptive codes in NVivo

Authors reported influences rather than barriers or facilitators

Influences on food choices outside the school included advertising - there was a high awareness of food adverts from TV and magazines and it generated much discussion. They were able to recognise and discuss adverts for unhealthy and healthy foods (e.g., diet adverts for healthy rain on about healthy grains: the adverts for unhealthy things tell you how nice they taste). Although children could readily identify the ploys used in adverts to get them eat certain things and they felt they were not personally influenced by it (just after your money), many did enjoy the foods targeted at them and enjoyed going to places like burger bars.

* Parents and the home environment - children perceived parents to be a key influence. They reported positive and negative sanctions (e.g., getting sent to bed if they don't eat veg), but some reported a more positive environment whereby parents healthier choices influenced the children.

* Friends were less of an influence 'we don't talk about it' (p74), but sharing sweets and eating at each other's houses did come up.

* Disposable cash - children saw pocket money as a way to buy sweets. They did not see using this money to buy healthy foods as a legitimate use of their money and thought parents should buy them.

* Children did not identify friends as an influence on their healthy eating.

Children were well aware of the pressures on them (to be healthy) and of the contradictions in their own behaviour, and knew that they did not always act on what they knew to be healthy. 'When they (the Apple project) come round, you think right, I'm going to get healthy now, but when you get home, you get something out of the fridge or something' (Boys, Year 6). At home, I just nip up to the biscuit tin! (Boys, year 5) p74 - and temptation kills the healthy thing that you want and all the things that are good for you are awful. (Boys, year 6) p74. Problems with school dinners - ''But once you go down for the school dinners it's a different story, because you've got all your favourite foods!' (Boys, Year 6). p74. Some children reported throwing away foods they knew had been put in because they were 'good for you' and only ate the crisps and chocolate. Influence of advertising - reported keenness to emulate footballer Alan Shearer by eating at MacDonald's. My brother says we have to go to there because Alan Shearer has been there! (Girls, Year 5). People thing I want to be like Alan Shearer so I better go to MacDonald's! (Boys, Year 6). Children said that adverts made them feel hungry' and were particularly keen on those portraying footballers and burgers and, or 'Snickers and the England Team! All adverts for healthy stuff go on about healthy things, the adverts for unhealthy stuff tell you how nice it tastes.' (p75) Having pocket money having pocket money to spend was seen as a major reason for consuming sweets. p75

What do children think helps them to eat healthily?
Axial coding

Dixey et al (2001)

Characters: 463 to 978

Children were aware of the relationship between diet and health, in particular for health consequences in the future (main health consequence of not eating healthily was identified as heart disease, although a minority mentioned cancer), although some children did recognise the importance of healthy eating so that they could do things now ("move and run about"). Fat also featured heavily in children's accounts of heart disease (e.g. "too many crisps means too much fat which blocks the arteries of the heart").

Characters: 982 to 1079

Children identified social as well as health concerns as important reasons for not being too fat


Characters: -1 to 180

James

This study addresses the more specific questions of what are children's perceptions of fruit and vegetables. The children's likes and dislikes with regard to vegetables may r

Characters: 195 to 417
Structuring the descriptive codes into descriptive themes
Final list of descriptive themes

Understandings of healthy eating

Chosen foods

Influences on foods eaten

Provided foods

Food in the school

Food in the home

Healthy eating concepts (understanding)

‘Good’ and ‘bad’ foods

Health consequences

Food preferences

Health benefits

Knowledge behaviour gap

Roles and responsibilities

Non-influencing factors

Limited choices

Eating to socialize

Contradictions

Food rules

Breaking rules
Stage 3: generating analytical themes

The descriptive themes stayed very ‘close’ to the content of the primary studies, but…

Our synthesis of descriptive themes, did not answer our review question directly

Barriers and facilitators framework:

• What do children think stops them from eating healthily?
• What do children think helps them to eat healthily?
• What ideas do children have for what could or should be done to promote their healthy eating?

‘Recommendations for interventions’

Analytical themes emerged through a cyclical process which involved interrogating the descriptive themes to answer these questions
1) Children don’t see it as their role to be interested in health.

2) Children do not see future health consequences as personally relevant or credible.

3) Fruit, vegetables and confectionary have very different meanings for children.

4) Children actively seek ways to exercise their own choices with regard to foods.

5) Children value eating as a social occasion.

6) Children recognise contradiction between what is promoted and what is provided.
Implications for interventions

1) Children don’t see it as their role to be interested in health.

2) Children do not see future health consequences as personally relevant or credible.

3) Fruit, vegetables and confectionary have very different meanings for children.

4) Children actively seek ways to exercise their own choices with regard to foods.

5) Children value eating as a social occasion.

6) Children recognise contradiction between what is promoted and what is provided.

Brand fruit and vegetables as ‘tasty’ rather than ‘healthy’.

Reduce health emphasis of messages

Do not promote fruit and vegetables in the same way within the same intervention.

Create situations for children to have ownership over their food choices.

Ensure messages promoting fruit and vegetables are supported by appropriate access to fruit and vegetables.
Synthesis 3: Across studies

Matrix used to juxtapose synthesis 1 alongside synthesis 2

Comparative analysis:

• Which interventions match children’s views and experiences?

• Have some perspectives been ignored?

• Do those interventions which match children’s perspectives show bigger effect sizes?
## Synthesis 3: Across studies

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Good quality</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not promote fruit and vegetables in the same way</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Brand fruit and vegetables as an ‘exciting’ or child-relevant product, as well as a ‘tasty’ one</td>
<td>5</td>
<td>5</td>
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<tr>
<td>Reduce health emphasis in messages to promote fruit and vegetables particularly those which concern future health</td>
<td>5</td>
<td>6</td>
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</table>
Synthesis 3: Across studies

Increase (standardised portions per day) in vegetable intake across trials

Little or no emphasis on health messages
‘Mixed method’ systematic reviews

Preserves the integrity of the findings of the different types of studies

Integrates ‘quantitative’ estimates of benefit and harm with ‘qualitative’ understanding from people’s lives

Facilitates a critical analysis of intervention studies from the point of view of those targeted by interventions
Other examples

- Children and physical activity
- Young people and mental health
- Young people, pregnancy and social exclusion
- HIV health promotion and men who have sex with men (MSM)
- Young people and physical activity
- Young people and healthy eating
- Young people, pregnancy and social exclusion

All available on the EPPI-Centre website:

http://eppi.ioe.ac.uk/EPPIWeb/home.aspx

The methods described here are published in the *British Medical Journal* 328: 1010-1012
Thank you!

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