Evaluating the cost-effectiveness of Cognitive Behavioural Therapy for Overweight / Obese Adolescents

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Economic Evaluation

• Economic evaluation:
  – Systematic evaluation of the costs and consequences of alternative courses of action
  – Often undertaken alongside RCTS
    • Prospective accurate data
    • Appropriate outcome measures

• Incremental Cost-Effectiveness Ratio (ICER) =
  Cost(干预) – Cost(对照)
  Outcome(干预) – Outcome(对照)

• Which costs do we want to include? Which outcomes are most appropriate for cost-effectiveness?
Background (1)

- ATN centre for Metabolic Fitness
- RMIT and UniSA PG work on CBT for overweight and obese adolescents
  - Leah Brennan’s PhD thesis
- Economic research in health
  - One strand is economic evaluation
  - Adds value to trial results

Background (2)

- Increasing concern about overweight/obese children in Australia
- NICE recommendations
  - BMI measurement in children and young people should be related to the UK 1990 BMI charts to give age- and gender-specific information.
  - Tailored clinical intervention should be considered for children with a BMI at or above the 91st percentile, depending on the needs of the individual child and family.
  - Assessment of co-morbidity should be considered for children with a BMI at or above the 98th percentile.
Background (3)

- Behaviour therapy (BT) and CBT, incorporating diet and exercise changes → greater weight loss than diet and/or exercise interventions
- Recent improvements in CBT model of overweight and obesity expected to result in better maintenance of weight loss
- CBT can be delivered effectively individually/group settings by range of health professionals
- May be effective and cost effective method of promotion of healthier weight among overweight and obese people.

CHOOSE Health

- Aims
  - result in maintained 5 to 10% weight loss
  - mediate/reduce the biological outcomes of overweight and obesity
  - improve eating and physical activity habits
  - reduce disordered eating
  - improve psychosocial functioning.
The Program

• 12-session program + follow-up
  – Uses CBT to promote improved eating habits, healthy food choices, reduced sedentary behaviour, and increased physical activity.
  – CBT also used to address the physical, social, cognitive and emotional barriers to long-term behaviour change
• 12 treatment sessions, 2 maintenance clinic sessions, 8 maintenance phone calls.
• Initial trials with 63 overweight or obese adolescents
  – improvements in self-reported eating, physical activity and sedentary behaviours and laboratory measured fitness and body composition.
• Is CBT in this population group cost-effective?

Comparators

1. Motivational interviewing (MI)
   – technique developed in the treatment of alcoholism; now used widely in the drug and alcohol field
   – aims to assist the individual to become ready for change (Miller & Rollnick, 1991, 2002)
   – has been used in conjunction with CBT to increase treatment initiation and completion rates; to improve treatment outcomes
   – use of MI in the treatment of overweight and obesity has received very little attention in the theoretical and empirical literature (Wilson & Schlam, 2004).
   – Also received CBT
2. Waiting list for CBT
   – Did not receive CBT
Trial of CBT (Brennan, 200)

120 Intake Phone calls Completed
80 Consent Forms Returned
75 Commenced Assessment
63 Completed Assessment

34 Allocated to CBT
29 Allocated to MI

23 Treatment
11 Controls
19 Treatment
10 Controls

Table 109: Descriptive Statistics for BMI, BMI-For-Age Percentile, and BMI-For-Age Z-Score

<table>
<thead>
<tr>
<th></th>
<th>Total Sample</th>
<th>Males</th>
<th>Females</th>
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<tr>
<td></td>
<td>N</td>
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<tr>
<td>Pre</td>
<td>43</td>
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<td>43</td>
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<td>5.20</td>
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<td>Control</td>
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<td>BMI-For-Age Percentile</td>
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<tr>
<td>Pre</td>
<td>43</td>
<td>96.69</td>
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<td>BMI-For-Age Z-Score</td>
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<tr>
<td>Control</td>
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<td>2.19</td>
<td>.32</td>
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Results

• Interpreting BMI-for-age z scores
  – 0= normal weight
  – 91st percentile= overweight=1.34 sd from mean
  – 98th percentile= obese = 2.05 sd from mean

• Children in trial generally obese
• Even with improvement, most remained obese
• BMI-for-age z score, BMI statistically significantly different
• BMI percentile not significantly different.

Other effectiveness results

• Treatment ►
  – improved body composition, self-reported eating, physical activity and sedentary behaviours and laboratory measured fitness and body composition.
• Sustained or improved body composition following maintenance.
  – Lean body mass not affected by the intervention treatment did not detrimentally effect linear growth and lean body tissue.
• Participation in a motivational interview did not influence treatment outcomes.
• BMI based weight classification systems did not consistently classify adolescent overweight and obesity
• Weight classification based on BMI criteria a poor indicator of percent body fat, particularly in males.
Cost of 12 sessions of treatment

Costs of CBT for obesity in adolescents

<table>
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<tr>
<th>Period</th>
<th>Cost Item</th>
<th>Unit Cost</th>
<th>Total (italic if research setting only)</th>
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<td>Intake</td>
<td>15 minute questionnaire (research setting only)</td>
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<td>$12.48</td>
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<td>Assessment</td>
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<tr>
<td></td>
<td>Printing (12 pages)</td>
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<td>Treatment</td>
<td>Monitoring instructions (30 minutes) (research setting only)</td>
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<td>$24.96</td>
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<tr>
<td></td>
<td>12 sessions (1 hour per session)</td>
<td>$49.92 p/h</td>
<td>$899.04</td>
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<td>Maintenance</td>
<td>2 sessions (1 hour)</td>
<td>$49.92 p/h</td>
<td>$99.84</td>
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<td>8 phone calls (15 minutes)</td>
<td>$49.92 p/h</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td><strong>$849.24 ($886.68)</strong></td>
</tr>
</tbody>
</table>

- Assumption that contacts are with a public psychologist Grade 3, Year 2. On-costs of 30% have been added and includes a period of preparation time for each consultation.

Cost-effectiveness results

- Cost per change in z score?
  - $7718 per unit decrease in z score ($849/0.11)

- Meaningless?
  - Need same outcome/s
    - Lives saved, life-years saved, QALYs gained
  - Need threshold (implied WTP)
    - PBAC implicit threshold $70,000-$80,000/QALY gained
Issues: effectiveness

- Small trials
- Short-term follow-up
- One-to-one intervention

Issues: Costs

- In the short run, CBT for obesity in adolescents is likely to be expensive
  - Usually done individually
  - Large time demands for each participant (16 hours of contact time in Choose Health, plus preparation time)
  - Highly qualified practitioners required
Short-term savings

• Possible savings using group therapy
  – If a similar outcome can be achieved, cost per child will fall in proportion to the size of the group
  – i.e., if 3 children in all treatment maintenance sessions, the cost/child = $383.

• Possible savings using less qualified staff

Summary of issues

• Short-term analysis makes CBT appear less cost-effective than it is.
• In the short run, we can identify responders.
  – fail to capture the true benefit of CBT in this population group, as mortality and morbidity effects in adolescence are relatively small.
• In the long-term, might expect some compensating cost savings
  – Fewer working days lost to obesity-related conditions
  – Reduced medical expenditure
  – Changing food expenditure?
  – However, this data requires complex and highly uncertain data modelling
What is the solution?

• Rely on short term data?
  – Most reliable but unlikely to capture either the true cost or outcome.
• Long-term follow up?
  – To capture the true benefits, this would have to extend across decades rather than years (unrealistic?)
• Data modelling?
  – Do we have enough evidence about changing behaviour, and the link between changing behaviour and weight over time, to do this?

Conclusions

• Economic evaluation can provide clinical/policy relevant information
• Limited if evidence about long-term outcomes not available
• Need comparable outcome measures (LY saved, QALY gained) to judge relative cost-effectiveness.