Long term weight loss: a systematic review

STTI, Research Congress 2015
Dr Jo Gilmartin & Monica Murphy,
University of Leeds,
UK
Background

• Global obesity epidemic is a major public health challenge.
• Health policy drivers for tackling obesity are frequently ignored (NICE guidelines).
• Studies & clinical trials point to benefits of commercial weight loss programmes (Truby et al. 2006).
• 8 arm RCT (Jolly et al. 2011) reported that weight watchers, slimming world are more powerful, effective & cheaper than healthcare programmes.
Maintaining weight loss: Obesity Reviews

- Evidence to suggest that behavioural change in relation to eating, physical activity & lifestyle is empowering (Avenell et al. 2004; Dombrowski et al. 2010).
- A review of 13 RCT’s reported the impact of extended care (3.2kg difference in weight loss over 17.6 months) (Middleton et al. 2012).
- Another review reported the benefits of Orlistat additional to behavioural change (Dombrowski et al. 2014)
- Dearth of substantive evidence regarding long term weight loss maintenance.
Methods

- PICO formulated Question: ‘How effective are behavioural interventions in maintaining long term weight loss?’
- Systematic Review in line with PRISMA checklist (Moher et al. 2009)
- Followed a pre-specified protocol
- Search strategy was applied to 6 data bases
- Quality assessment/ data extraction by JG & MM
- Statistical analysis were performed using Revman 5.2 (2014)
Results: Flow Diagram

Identification

- Number of articles identified through database searching (n=2480)
- Number of articles identified through other sources (i.e. Hand search of reference lists) (n=3)

Screening

- Number of records after duplicates removed (n=2428)
- Number of records screened (n=1868)

Eligibility

- Number of full text articles assessed for eligibility (n=120)

Included

- Number of studies (RCT’s) included in the review (n=13)

Excluded

- Number of records excluded (n=560)
  - Not RCT’S
  - Not focused primarily on weight loss
  - Did not consider sustainability of weight loss
  - Did not meet the age criteria
  - Focus on policy making or economic outcomes
- Number of full text articles excluded (n=107)
Forest Plots: % Change of body weight

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Experimental Mean</th>
<th>Experimental SD</th>
<th>Experimental Total</th>
<th>Control Mean</th>
<th>Control SD</th>
<th>Control Total</th>
<th>Weight</th>
<th>Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gagnon et al. 2011</td>
<td>-4.9</td>
<td>4.6</td>
<td>17</td>
<td>-0.6</td>
<td>3.3</td>
<td>24</td>
<td>37.3%</td>
<td>-4.30 [-6.85, -1.75]</td>
</tr>
<tr>
<td>Latner et al. 2013</td>
<td>-10.5</td>
<td>14.46</td>
<td>52</td>
<td>-9.6</td>
<td>13.3</td>
<td>38</td>
<td>7.3%</td>
<td>-0.90 [-6.67, 4.87]</td>
</tr>
<tr>
<td>West et al. 2011</td>
<td>-5.28</td>
<td>9.11</td>
<td>201</td>
<td>-1.38</td>
<td>8.02</td>
<td>88</td>
<td>55.4%</td>
<td>-3.90 [-6.00, -1.80]</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>270</strong></td>
<td><strong>150</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>-3.83</strong></td>
<td><strong>[-5.39, -2.27]</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Heterogeneity: Tau² = 0.00; Chi² = 1.12, df = 2 (P = 0.57); I² = 0%

Test for overall effect: Z = 4.81 (P < 0.00001)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Experimental Mean</th>
<th>Experimental SD</th>
<th>Experimental Total</th>
<th>Control Mean</th>
<th>Control SD</th>
<th>Control Total</th>
<th>Weight</th>
<th>Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooper et al. 2010</td>
<td>-1.36</td>
<td>7.99</td>
<td>82</td>
<td>0.04</td>
<td>0.05</td>
<td>47</td>
<td>28.6%</td>
<td>-1.40 [-3.13, 0.33]</td>
</tr>
<tr>
<td>Merlin et al. 2003</td>
<td>-6.8</td>
<td>5.77</td>
<td>17</td>
<td>-8.6</td>
<td>6.2</td>
<td>15</td>
<td>9.2%</td>
<td>1.80 [-2.37, 5.97]</td>
</tr>
<tr>
<td>Perri et al. 2001</td>
<td>-8.5</td>
<td>8</td>
<td>43</td>
<td>-4.14</td>
<td>4.85</td>
<td>15</td>
<td>12.5%</td>
<td>-4.36 [-7.79, -0.93]</td>
</tr>
<tr>
<td>Wadden et al. 2011</td>
<td>-1.25</td>
<td>1.53</td>
<td>226</td>
<td>-0.6</td>
<td>1.48</td>
<td>110</td>
<td>49.7%</td>
<td>-0.65 [-0.99, -0.31]</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>368</strong></td>
<td><strong>187</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>-1.10</strong></td>
<td><strong>[-2.50, 0.29]</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Heterogeneity: Tau² = 0.99; Chi² = 6.48, df = 3 (P = 0.09); I² = 54%

Test for overall effect: Z = 1.55 (P = 0.12)
Single studies: % change of body weight

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Experimental Mean</th>
<th>SD</th>
<th>Total</th>
<th>Control Mean</th>
<th>SD</th>
<th>Total</th>
<th>Weight</th>
<th>Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Svetkey et al. 2008</td>
<td>-3.75</td>
<td>5.39</td>
<td>644</td>
<td>5.5</td>
<td>5.36</td>
<td>320</td>
<td>100.0%</td>
<td>-9.25 [-9.97, -8.53]</td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td></td>
<td></td>
<td>644</td>
<td></td>
<td></td>
<td>320</td>
<td></td>
<td>-9.25 [-9.97, -8.53]</td>
</tr>
<tr>
<td>Heterogeneity: Not applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 25.19 (P &lt; 0.00001)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Experimental Mean</th>
<th>SD</th>
<th>Total</th>
<th>Control Mean</th>
<th>SD</th>
<th>Total</th>
<th>Weight</th>
<th>Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wadden et al. 2013</td>
<td>-6.2</td>
<td>7.3</td>
<td>212</td>
<td>-0.2</td>
<td>7</td>
<td>210</td>
<td>100.0%</td>
<td>-6.00 [-7.36, -4.64]</td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td></td>
<td></td>
<td>212</td>
<td></td>
<td></td>
<td>210</td>
<td></td>
<td>-6.00 [-7.36, -4.64]</td>
</tr>
<tr>
<td>Heterogeneity: Not applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 8.62 (P &lt; 0.00001)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Study Limitation

- High heterogeneity among the studies.

- ITT principles and methods to handle missing data are not clearly reported across some studies.

- Blinding of participants and outcome assessors is very limited.

- Reasons for dropouts were only reported across 9 studies.
Implications

• Current evidence suggests that extended care & diverse modes of delivery are effective for long term weight loss.

• Short term use of drugs can kick start weight loss but sustained change is subject to multiple influence & tailored support.

• Regular contact time is shown to enhance motivation which could be levered up through existing ehealth & mobile technology.
References


