The Cost-Effectiveness of LighterLife as an Intervention for Obesity in the UK

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Background and Objectives
LighterLife Total is a very low calorie diet (VLCD) total dietary replacement weight reduction programme, which provides Food packs, behavioural change therapy and group support appropriate for people with a body mass index (BMI) of 30 kg/m² or above. This study evaluated the cost-effectiveness of LighterLife Total against existing interventions available to obese patients (BMI of 30 kg/m²; no treatment, Weight Watchers, Countertweight and Slimming World) and to a subgroup of patients who have a BMI of 40+ kg/m² (no treatment, gastric banding and gastric bypass). Comparison against the other dietary interventions was not made in the 40+ kg/m² subgroup due to a lack of data on the effectiveness of these interventions in this patient group.

Methods
A de novo-economic model was built with the analysis conducted from the perspective of the UK National Health Service (NHS) using a 10-year time horizon. The starting age of participants and baseline BMI were differentiated by BMI group and were based on the average of participants in the LighterLife data set. The starting ages for the 30+ kg/m² and 40+ kg/m² groups were 45.63 and 45.54 and the baseline BMIs were 36.32 and 44.55, respectively (Rolland et al. 2015). Discounting was applied to costs and benefits at an annual rate of 3.5%.

The effectiveness of interventions was focused around the average change in BMI at 12 months from baseline (defined as the beginning of treatment) and the subsequent average annual BMI change. For each intervention its subsequent annual BMI increase was applied until the average BMI of the cohort converged with the BMI of the no treatment group, at which point the BMI of the cohort was capped by the BMI for the no treatment group. In the no treatment group and for those who discontinued treatment, a background natural annual change in BMI of 0.16 was applied, which was calculated as the average of the natural annual BMI change for men and women (Ara et al. 2012). It was assumed that the BMI of participants on each of the interventions would not go above the natural background BMI. The 12 month change and subsequent annual change in BMI for LighterLife was calculated from LighterLife data on file. As after the weight loss phase of the LighterLife programme participants can move onto the management phase and may remain in this phase for as long as they wish, retention was calculated. It was assumed that participants who remained on a programme beyond the weight loss phase incurred the costs of the management phase. Those participants who discontinued were assigned the effectiveness data of the no treatment group. The 12 month and subsequent BMI changes for the comparators were taken from published sources and are shown in Table 1. The subsequent BMI increase for the dietary comparators was not available and so the conservative assumption of applying the natural BMI change was applied. Retention data were not applied for the comparators, which were either short-term interventions lasting less than one year or surgical and therefore permanent.

Table 1: Change in BMI by intervention

<table>
<thead>
<tr>
<th>Intervention</th>
<th>12 month change in BMI</th>
<th>Yearly BMI increase</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>LighterLife 30+ kg/m²</td>
<td>-8.036</td>
<td>0.693</td>
<td>LighterLife data on file</td>
</tr>
<tr>
<td>LighterLife 40+ kg/m²</td>
<td>-13.454</td>
<td>0.954</td>
<td>LighterLife data on file</td>
</tr>
<tr>
<td>No treatment</td>
<td>-0.160</td>
<td>0.136</td>
<td>Ara et al. 2012</td>
</tr>
<tr>
<td>Countertweight</td>
<td>-1.080</td>
<td>0.180</td>
<td>Jolly et al. 2011</td>
</tr>
<tr>
<td>Weight Watchers</td>
<td>-1.170</td>
<td>0.180</td>
<td>Jolly et al. 2011</td>
</tr>
<tr>
<td>Slimming World</td>
<td>-0.710</td>
<td>0.180</td>
<td>Jolly et al. 2011</td>
</tr>
<tr>
<td>Gastric banding</td>
<td>-8.964</td>
<td>0.155</td>
<td>Spiliot et al. 2012</td>
</tr>
<tr>
<td>Gastric bypass</td>
<td>14.218</td>
<td>0.155</td>
<td>Spiliot et al. 2012</td>
</tr>
</tbody>
</table>

In the 30+ kg/m² BMI group, LighterLife was associated with greater quality-adjusted life years than the comparators and at a willingness-to-pay of £20,000 per QALY is cost-effective (incremental cost-effectiveness ratios: £15,506, £16,593, £16,794 and £16,189, versus no treatment, Countertweight, Weight Watchers and Slimming World, respectively).

In the 40+ kg/m² BMI group LighterLife was cost-effective against no treatment (ICER = £5,891), but less effective than gastric banding and bypass. It should be noted that whilst LighterLife was estimated to be less effective than gastric banding overall, it was associated with a greater 12 month decrease in BMI.

Conclusions
LighterLife is a cost-effective intervention for patients with a BMI of 30+ kg/m² and cost-effective for patients with a BMI of 40+ kg/m² for whom bariatric surgery is not an option.

References
2 Jolly et al. 2011. Comparison of range of commercial or primary care led weight reduction programmes with minimal intervention control for weight loss in obesity: Lighter Up randomised controlled trial. BMJ 343.

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