

## Effectiveness of primary care-relevant treatments for obesity in adults: a systematic evidence review for the US preventive services task force

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### CRD summary

This review concluded that behavioural interventions were safe and effective for weight loss and maintenance. The authors' conclusions reflect the evidence presented, but this evidence had limitations, such as poor reporting, high rates of withdrawal, and variability between studies, that should be borne in mind when interpreting the conclusions.

### Authors' objectives

To assess the effectiveness and harms of weight loss interventions, for overweight and obese adults, conducted in settings relevant to primary care.

### Searching

The authors used published systematic reviews and guidelines to identify studies published up to 2005. They searched MEDLINE, PsycINFO and the Cochrane Central Register of Controlled Trials (CENTRAL) for articles from 2005 to September 2010. Search terms were included in the full report (LeBlanc, et al. 2011, see 'Other Publications of Related Interest'). The search was supplemented by consulting relevant systematic reviews, experts, and reference lists. It was restricted to English-language studies.

### Study selection

Randomised controlled trials (RCTs) and controlled clinical trials of interventions focused on weight loss in overweight or obese adults were eligible for the review if they were conducted in primary care settings or those to which primary care clinicians could refer patients. Outcomes of interest were short-term (12 to 18 months) and maintained (over 18 months) weight loss, improved physiological measures (glucose tolerance, blood pressure, and dyslipidaemia), and changes in selected health conditions, physical fitness, disability, emotional functioning, and mortality. Control groups had to receive the usual care; trials in which the control group was considered to receive a low-intensity intervention were excluded. For the harms of weight loss interventions, studies with less than 12 months of follow-up and those with other designs were eligible.

Included trials evaluated behaviourally-based interventions alone or medication (orlistat or metformin) plus behavioural interventions. Two-thirds of the included trials were conducted in the USA. Intensity of behavioural interventions varied widely between trials. Participants in behavioural trials had a mean body mass index (BMI) that ranged from 25 to 39kg per m<sup>2</sup> and their mean age ranged from 34 to 70 years. In medication trials, their mean BMI ranged from 32 to 38kg per m<sup>2</sup>. Overall, most participants were female and had clinical or subclinical cardiovascular risk factors, but some studies included unselected or low-risk participants. Those in the metformin trials had risk factors for diabetes.

Two reviewers independently selected studies for the review.

### Assessment of study quality

Two reviewers independently classified the included studies as good, fair, or poor, using design-specific criteria and US Preventive Services Task Force methods. Features assessed included validity of randomisation and measurement procedures, attrition, baseline characteristics, intervention fidelity, and statistical methods. Disagreements were resolved by a third reviewer. Trials rated as poor were excluded from the review of effectiveness.

### Data extraction

Data were extracted to calculate mean differences for continuous outcomes, and relative risks for dichotomous outcomes, with associated 95% confidence intervals. Data extraction was performed by one reviewer and checked by a second.

### Methods of synthesis

Trials of behavioural and pharmacological interventions were synthesised separately, with separate analyses by medication. Pooled effect sizes were estimated using random-effects meta-analyses. Within each intervention type, trials were grouped by the population's risk status and intensity of the intervention.

Heterogeneity was assessed using  $\chi^2$  and  $I^2$ . Heterogeneity of the effect size for weight loss was explored through a series of meta-regression analyses. Publication bias was assessed, using funnel plots and the Egger linear regression method if there were 10 or more studies.

### Results of the review

**Effectiveness:** Fifty-eight trials were included, of which 38 (13,495 participants) involved behavioural interventions, 18 (11,256 participants) involved orlistat plus behavioural interventions, and three (2,652 participants) involved metformin plus behavioural interventions (one trial was of behavioural interventions alone and with metformin). Behavioural intervention trials were of fairly high quality (24% rated good), but there were few high quality drug trials.

Behavioural interventions (WMD -3.01kg, 95% CI -4.02 to -2.01; 21 trials), with orlistat (WMD -2.98kg, 95% CI -3.92 to -2.05; 12 trials), and with metformin (WMD -1.52kg, 95% CI -2.82 to -0.21; three trials) significantly improved weight loss at 12 to 18 months, compared with control conditions. More intensive interventions were associated with more weight loss. Heterogeneity was substantial in all analyses.

Data for long-term health outcomes were insufficient to draw any firm conclusions. All interventions

reduced the incidence of diabetes, based on data from two or three trials each. Effects on outcomes, such as lipids and blood pressure, were mixed and generally small.

**Harms:** All trials from the effectiveness review plus 12 other studies were included (70 studies).

Ten studies reported on the possible harms of behavioural interventions, and three of the four trials that investigated this outcome reported a decrease in total or hip bone mineral density with weight loss.

Twenty-three RCTs (12,174 participants) and one event monitoring study (16,021 participants) reported on the harms of orlistat. In the RCTs, withdrawals were higher with orlistat than with placebo, mainly because of gastrointestinal symptoms, but serious adverse effects were not increased.

Four trials, with 2,712 participants, reported on the harms of metformin. Withdrawals caused by adverse effects were more common with metformin than with placebo; the main adverse effect was gastrointestinal symptoms.

The results of other analyses were reported, but those of the assessment of publication bias were not.

### **Authors' conclusions**

Behavioural interventions were safe and effective for weight loss and maintenance.

### **CRD commentary**

The review questions and inclusion criteria were clear and the authors searched a range of relevant sources. Only English-language studies were included, so relevant studies published in other languages could have been missed (language bias). Publication bias was assessed, but the results were not reported in this paper, so the risk of bias is unclear. Appropriate methods were used to minimise reviewer error or bias during the review process.

The quality of included studies was assessed using standard methods and the results were used in study selection and synthesis. Standard methods were used to assess and investigate heterogeneity in the meta-analyses. Some relevant details of the included studies were presented. The authors identified various limitations to them, such as poor reporting, few studies in actual primary care settings, high rates of attrition, and significant statistical and clinical heterogeneity.

This was a generally well-conducted review. The authors' conclusions reflect the evidence presented, but the limitations of this evidence should be borne in mind when interpreting the conclusions.

### **Implications of the review for practice and research**

**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that obtaining data on the long-term effects of weight loss interventions on weight and health outcomes should be a priority for future research. They recommended research: to clarify which benefits were derived specifically from weight loss as opposed to behavioural mediators, such as physical activity or dietary change; to investigate cost-effectiveness; and to identify the best screening tool for obesity.

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### **Bibliographic details**

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### **Additional Data URL**

<http://www.uspreventiveservicestaskforce.org/uspstf11/obeseadult/obesees.pdf>

### **Other publications of related interest**

LeBlanc E, O'Connor E, Whitlock EP, Patnode CD, Kapka T. Screening for and management of obesity and overweight in adults. Rockville, MD, USA: Agency for Healthcare Research and Quality. Evidence Synthesis; 89. 2011.

### **Indexing Status**

Subject indexing assigned by CRD

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### **Record Status**

This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.