Interventions to achieve long-term weight loss in obese older people: a systematic review and meta-analysis

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CRD summary
The authors concluded that although reductions in weight were found for weight loss interventions in older people, there was a lack of high-quality evidence to support their efficacy. Although there were limitations in the review, overall the authors’ conclusions appeared to reflect the evidence and are likely to be reliable.

Authors’ objectives
To evaluate interventions aimed at producing sustained weight loss in older obese adults.

Searching
The authors stated that they searched 13 databases from 1966 to 2001 and MEDLINE, PsycINFO, EMBASE, The Cochrane Library and CINAHL from 2001 to December 2008. Four obesity and geriatrics journals were handsearched. Some information about search terms was reported. No language restrictions were applied.

Study selection
Randomised controlled trials (RCTs) that compared interventions primarily aimed at weight loss with placebo, no intervention or another active intervention were eligible if they enrolled patients with a mean age at least 60 years and a body mass index (BMI) of at least 30kg/m² and had a minimum follow-up period of one year.

Outcomes of interest were weight, BMI, total cholesterol, high-density cholesterol (HDL), low-density cholesterol (LDL), triglycerides, fasting glucose, glycosylated haemoglobin (HbA1c), blood pressure, deaths, hospitalisations, morbidity, quality of life, measures of physical function and exercise capacity, and drop-outs.

All of the studies except one evaluated dietary advice. Other intervention components included exercise or advice about physical activity, behavioural counselling and various activities. Control interventions varied and included usual care, clinic appointments, talks, discussions and less intensive interventions. All of the studies except one were set in USA. Studies included single and multicentre studies. Interventions were conducted in primary care, the community and secondary care. Mean age ranged from 58 to 71 years. All patients lived in the community. A few studies targeted patients with BMI at least 35kg/m². Most studies were in patients with specific medical conditions; these included diabetes mellitus, coronary artery disease and osteoarthritis.

The authors did not state how papers were selected for the review.

Assessment of study quality
Two reviewers independently assessed validity using allocation concealment, descriptions of drop-outs, intention-to-treat (ITT) analysis, blinding and baseline comparability of treatment groups. Disagreements were resolved by consensus.

Data extraction
Where required, standard deviations were input and BMI data were converted to weight (details were reported).

Two reviewers independently extracted data and resolved disagreements by consensus. Authors were contacted for clarification of data.

Methods of synthesis
Where possible, random-effects meta-analyses were used to pool data and weighted mean differences (WMD) with 95% confidence intervals (CI) were calculated. Heterogeneity was assessed using the $I^2$ statistic. Post hoc subgroup
analysis was used to explore potential causes of heterogeneity among studies that reported weight loss outcomes. Otherwise, studies were combined in a narrative synthesis.

**Results of the review**
Nine RCTs were included (n=1,954 patients). Sample size ranged from 27 to 648. Duration of follow-up ranged from one to 3.2 years.

Study quality was variable. Two studies clearly reported ITT analysis. In most studies there was insufficient detail to determine whether allocation concealment were adequate. Most studies reported the number of withdrawals. All studies reported comparable treatment groups at baseline. Only one study clearly reported blinding of carers or outcome assessors. Where reported, drop-out rates ranged from 1% to 20%.

Interventions were associated with a statistically significant reduction in weight at 12 months follow-up compared to control (WMD -3.0kg, 95% CI -5.1 to -0.9; seven studies). Significant heterogeneity was found ($I^2=89\%$).

There was no statistically significant difference between intervention and control for total cholesterol (four studies), LDL (two studies), HDL (two studies), triglycerides (two studies), HbA1c (one study), six-minute walk distance (one study) and quality of life (two studies). Significant heterogeneity was found for total cholesterol ($I^2=77\%$) and triglycerides ($I^2=83\%$).

One study reported a significant reduction in recurrence of hypertension or cardiovascular events in the intervention group compared to the control group (hazard ratio 0.65, 95% CI 0.50 to 0.85).

Other results were reported.

**Cost information**
One study evaluated dietary advice and estimated the cost at US$137 per patient.

**Authors’ conclusions**
Reductions in weight were found, but there was lack of high-quality evidence to support the efficacy of weight loss interventions in older people.

**CRD commentary**
The review question was clearly stated and inclusion criteria were appropriately defined. Many relevant sources were searched. Attempts were made to minimise language bias. No attempts were made to minimise publication bias (this limitation was acknowledged by the authors). Validity was assessed and results were reported and taken into account when considering the evidence. Methods were used to minimise reviewer errors and bias in data extraction and validity assessment; it was unclear whether similar steps were taken during study selection. Meta-analysis was used to pool data for several outcomes. Potential reasons for statistical heterogeneity were examined for weight loss studies, but not for other studies assessing lipid outcomes.

There were limitations to the review, but overall the authors’ conclusions appeared to reflect the evidence and are likely to be reliable.

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

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

**Research:** The authors stated that there was a need for further research to evaluate weight loss interventions in older people, particularly those with comorbidities. Future studies should be based on psychological theories tailored to this age group, fully report baseline patient characteristics and assess patient-centred outcomes in addition to weight, cardiovascular risk factors and clinical outcomes.

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