

## Maintenance of weight loss after lifestyle interventions for overweight and obesity, a systematic review

Barte JC, ter Bogt NC, Bogers RP, Teixeira PJ, Blissmer B, Mori TA, Bemelmans WJ

### CRD summary

This review investigated the relationship between weight loss during a lifestyle intervention and weight maintenance after at least one year of unsupervised follow-up and concluded that percentage maintenance did not depend on initial weight loss; 10% or more weight loss can be favoured above lower weight loss goals. Weaknesses in the analyses suggest a cautious interpretation of the conclusions.

### Authors' objectives

To investigate the relationship between weight loss during a lifestyle intervention (with a dietary and physical activity component) and weight maintenance after at least one year of unsupervised follow-up.

### Searching

MEDLINE was searched from January 1990 to February 2009 for studies published in English. Search terms were reported in a previous paper (see Other Papers of Related Interest). References of relevant recent reviews (published from January 2002 to February 2009) were examined for further studies.

### Study selection

It appeared that randomised controlled trials with at least 20 overweight or obese participants (mean body mass index <40kg/m<sup>2</sup>) in each intervention group, most of whom were Caucasian, were eligible for inclusion. Studies needed to investigate at least one intervention of at least one month duration with a dietary and physical activity component. Mean weight (or body mass index) had to demonstrate at least 2% reduction at the end of the intervention. Unsupervised follow-up was required for one year after the intervention. The primary outcome of percentage weight maintenance (percentage weight loss that remained after unsupervised follow-up) had to be calculable. Studies that included only individuals with diabetes, impaired glucose tolerance or another serious disease, or those on weight loss medication or undertaking surgery were excluded.

The interventions varied between the included studies and generally involved an energy-restricted diet and behavioural group sessions. Mean baseline weight of the participants was 95kg and a mean of 9.5% (4.1kg) was lost during the interventions.

The authors did not state how many reviewers selected studies for inclusion.

### Assessment of study quality

The authors did not state that study quality was assessed. Mean drop-out rates in the intervention groups were noted.

### Data extraction

Data were extracted to calculate percentage maintenance of weight loss for each study and intervention group. Methods used were dependent on the data available (calculations detailed in the paper). Weight maintenance within the four intervention groups with more than 75 participants at baseline was calculated. Percentage maintenance after one year of unsupervised follow-up was calculated for participants with zero to 5%, 5% to 10% and more than 10% weight loss during the intervention period. The authors of primary studies were contacted for additional data where necessary.

The authors did not report how many reviewers performed data extraction.

### Methods of synthesis

A one-sided Pearson correlation was used to assess the relationship between weight loss during intervention and percentage maintenance (*r*). Differences in weight maintenance between the categories less than 5%, 5% to 10% and more than 10% weight loss during intervention were tested using analysis of variance (ANOVA) weighted by the square root of study size.

### Results of the review

Twelve studies (22 intervention arms) were included in the review (999 participants). Mean duration of the intervention was 0.8 years (range 0.2 to 1.5). Mean duration of unsupervised follow-up was 1.1 years (range one to two years). Mean drop-out rates were 18% during the intervention and 13% during the unsupervised follow-up period.

Mean percentage weight maintenance was 54% (range 25% to 88%). There was no statistically significant association between weight loss during the intervention and percentage maintenance ( $r = -0.26$ ,  $p = 0.13$ ). There was no significant difference in weight maintenance between interventions with a weight loss of 5% to 10%, (weight maintenance 55%) compared with more than 10% (weight maintenance 49%,  $p = 0.39$ ). There was a significantly larger weight loss in the more than 10% group compared with the 5% to 10% group after one year of unsupervised follow-up for these categories (7% versus 3.7%,  $p < 0.01$ ).

Weight maintenance was also reported stratified by percentage weight loss during intervention for four individual intervention groups with more than 75 participants.

### Authors' conclusions

Percentage maintenance did not clearly depend on initial weight loss. Ten per cent or more weight loss can be encouraged and favoured above lower weight loss goals.

### CRD commentary

The research question was supported by inclusion criteria for participants, intervention and outcomes. The study designs included were not reported, although it appeared that randomised controlled trials

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were eligible for inclusion. The authors reported that the intervention arms were included in the analyses, which implied that some control or placebo arms were excluded when these may have provided important data that could have been included in the analysis. Average weight loss and maintenance were calculated across the intervention arms of 22 different studies with various interventions; these were treated as a single population for the correlation analysis. Only one database was searched for published studies in English, so this review may have been prone to publication and language biases and it was possible that relevant studies were missed. The processes of study selection and data extraction were not described, so any steps taken to reduce the possibility of bias and error were unknown. The authors stated that the results of this review could only be generalised to the healthy overweight population.

Poor reporting, weaknesses in the analyses used and the possibility of biases suggest that the authors' conclusions should be interpreted with caution.

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

**Practice:** The authors stated that 10% or more weight loss should be encouraged and favoured above lower weight loss.

**Research:** The authors stated that analyses of the pattern of weight regain after interventions over longer periods of follow-up were needed to provide insight into the relationship between weight maintenance and weight loss. Weight fluctuations need to be investigated. There was a need for further study on the psychological effects of weight regain following an intervention and its ultimate impact on future weight-related behaviours through factors such as reduced self-efficacy.

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#### **Bibliographic details**

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

Bogers RP, Barte JCM, Schipper CMA, Vijgen SMC, de Hollander EL, Tariq L, Milder IEJ, Bemelmans WJE. Relationship between costs of lifestyle interventions and weight loss in overweight adults. *Obes Rev* 2010; 11: 51-61.

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