The effect of weight reduction interventions for persons with type 2 diabetes: a meta-analysis from a self-regulation perspective

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CRD summary
This review evaluated self-regulation approaches for weight reduction interventions in patients with type 2 diabetes and concluded that self-regulation principles appeared to increase outcome effects. More research was needed to fully understand the relationships between self-regulation, weight and glycosylated haemoglobin. The reliability of these conclusions may be limited by potential for missing evidence and unknown quality of retrieved evidence.

Authors' objectives
To evaluate a self-regulation approach for weight reduction interventions in patients with type 2 diabetes.

Searching
Web of Science, PubMed and WebSPIRS databases were searched for relevant evidence published in English between 1990 and 2005. Search terms were reported. Attempts were made to identify further evidence through searching reference lists of retrieved studies and contacting experts in the field for unpublished studies.

Study selection
Randomised controlled trials (RCTs) that evaluated nonsurgical/non-pharmacological interventions in at least 10 adults with type 2 diabetes were eligible for inclusion. Studies had to provide sufficient data on weight loss or glycated haemoglobin (A1C) to permit calculation of effect sizes.

Included studies evaluated individual and/or group interventions focused on diet, exercise or both delivered face-to-face and in some cases also by phone. Intervention length ranged from six to 208 weeks (average 43.8 weeks). Length of follow-up ranged from 12 weeks to four years (average 58.5 weeks).

The authors did not state how many reviewers performed study selection.

Assessment of study quality
Studies were assessed using Cochrane Depression Anxiety and Neurosis criteria for psychological RCTs.

It appeared that two reviewers independently assessed validity.

Data extraction
Standardised mean difference effect sizes (d) and related 95% confidence intervals (CIs) were calculated for weight and glycated haemoglobin (A1C) for the included studies.

Two reviewers independently extracted data.

Methods of synthesis
Effect size d values and 95% CIs were pooled for studies with short follow-up (≤6 months), long follow-up (≥6 months) and all studies combined. Statistical heterogeneity was assessed with the Q statistic. Statistically homogeneous outcomes were pooled using a fixed-effect model and statistically heterogeneous outcomes were pooled using a random-effects model. Moderator effects were investigated among all combined studies.

Results of the review
Thirty-four studies (n=5,469) were included in the review.

Small statistically significant changes were seen in intervention compared to control groups for weight in the short term.
(d=0.18, 95% CI 0.08 to 0.27; 25 RCTs), long term (0.06, 95% CI 0.00 to 0.13; 21 RCTs) and for all studies combined (0.08, 95% CI 0.03 to 0.14; review article stated 36 RCTs). There was statistically significant heterogeneity among short-term weight outcome studies (p<0.05).

Larger statistically significant changes were seen for A1C in the short term (0.35, 95% CI 0.20 to 0.50; 23 RCTs), long term (0.34, 95% CI 0.14 to 0.54; 18 RCTs) and for all studies combined (0.35, 95% CI 0.21 to 0.49; 32 RCTs). There was statistically significant heterogeneity for all A1C comparisons (p<0.001).

"Goal reformulation" and "involvement of a partner or relative" were found to be significant moderators for weight and "emotional control" was found to be a significant moderator for A1C.

**Authors' conclusions**
Self-regulation principles appeared to increase outcome effects in weight reduction interventions for people with type 2 diabetes. More research was needed to fully understand the relationships between self-regulation, weight and A1C.

**CRD commentary**
The review question was specified for study design and broadly defined in terms of the participants, interventions and outcomes of interest. Evidence was identified from a number of sources. The search was limited to English-language publications within a relatively narrow range of dates; the authors did not provide any justification for the restrictions. Consequently, relevant evidence may have been missed. It appeared that attempts were made to minimise errors and bias at some stages of the review, but not at others. The authors stated that they assessed study validity, but did not report the results of this validity assessment.

The reliability of the authors' conclusions may be limited by potential for missing evidence and unknown quality of retrieved evidence.

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

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

Research: The authors stated that an RCT of a comprehensive self-regulation intervention would potentially increase knowledge regarding the importance of self-regulation for diabetes care.

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