Lifestyle intervention for preventing weight gain in young adults: a systematic review and meta-analysis of RCTs

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CRD summary
The review concluded that the small number and short duration of trials, as well as differences across trials, meant that the effectiveness of lifestyle interventions for preventing young adult weight gain remained unclear. The evidence base had several limitations, which reduces the reliability of the pooled results, thus the authors’ conservative conclusions seem appropriate.

Authors’ objectives
To evaluate lifestyle interventions for preventing weight gain in healthy young adults.

Searching
Twelve databases including PubMed, EMBASE and PsycINFO were searched from 1980 to end of August 2011 for articles in English. Search terms were reported. The reference lists of retrieved studies and a previous review were also searched.

Study selection
Randomised controlled trials (RCTs) of lifestyle interventions aimed at preventing weight gain in healthy young adults (aged 18 to 35 years) were eligible for inclusion. Trials in obese young adults or weight maintenance studies were excluded. Definitions of lifestyle interventions were provided in the review. The relevant outcomes were change in body weight (primary outcome) or body mass index (BMI).

The included trials studied a variety of interventions in participants with a mean age ranging from 18.1 to 33.0 years, where reported. Participants were recruited from colleges, universities, the general population or an obesity trial. Most participants were college educated females. All trials incorporated physical activity into the intervention. Trials were published between 1998 and 2010 and mainly conducted in the USA. The duration of interventions ranged from six weeks to 24 months (median of four months). The reported BMI at baseline ranged from 17 to 41 kg/m².

Two reviewers independently undertook study selection and disagreements were resolved by discussion with a third reviewer.

Assessment of study quality
Quality assessment was undertaken using the The Quality Assessment Tool for Quantitative Studies which appraised several criteria, including blinding and withdrawals and drop-outs. Risk of bias was assessed using the Cochrane Collaboration Tool, with each item scored as high risk, low risk or unclear risk of bias.

Two reviewers independently undertook quality assessment and disagreements were resolved by discussion with a third reviewer.

Data extraction
Data were extracted on BMI and body weight, and used to calculate effect sizes and 95% confidence intervals (CIs). Study authors were contacted for missing data.

One reviewer extracted data.

Methods of synthesis
Meta-analysis was used to calculate pooled effect sizes for body weight and 95% CIs. A random-effects model was used for control and intervention groups separately. I² was used to assess statistical heterogeneity. Univariate (a priori) and bivariate (post-hoc) meta-regression was undertaken to assess the effects of study characteristics on body weight. Publication bias was assessed using funnel plots, Begg’s rank correlation and Egger’s test. A narrative synthesis was
presented for BMI data.

**Results of the review**

Nine RCTs were included in the review (780 participants), and eight RCTs were included in the meta-analysis. The trial sample size ranged from 40 to 170 young adults. Trials generally had a low risk or unclear risk of bias overall; however, four trials did not report the method of randomisation and five trials did not report intention-to-treat data. Outcomes were assessed post-intervention in all except two studies where follow-up was at six months after a 10-week intervention or at 16 months after a four-month intervention.

The combined weighted mean change in weight in intervention participants was -0.87 kg (95% CI -1.56 to -0.18; I²=90.4%) and in control participants it was 0.86 kg (95% CI 0.14 to 1.57; I²=73.1%). There was evidence of significant statistical heterogeneity in both analyses. Post hoc meta-regression analyses revealed interventions using evidence-based guidelines which were of four months or longer duration were significantly associated with greater weight loss (Effect size -1.62kg, 95% CI -3.21 to -0.04).

Other results were presented in the review. There was evidence of publication bias for mean body weight change but a funnel plot suggested publication bias for the main outcome.

**Authors’ conclusions**

The small number, short duration and large heterogeneity of trials meant that the effectiveness of lifestyle interventions for preventing young adult weight gain remained unclear.

**CRD commentary**

Inclusion criteria for the review were clearly defined and several relevant databases were searched. There was potential for language bias, as only articles in English were included. Publication bias was detected but the meaningfulness of analysis with less than ten studies was limited. Attempts were made to reduce reviewer error and bias during study selection and quality assessment, but the same methods were not reported for data extraction.

Quality assessment indicated that the quality of the evidence base was variable. There were differences across the trials in terms of intervention, participants and control. The authors noted that most trials had a short duration. Where possible, data were combined using meta-analysis and statistical heterogeneity was reported; analyses showed high level of statistical heterogeneity, which the authors acknowledged.

Overall, the evidence base had several limitations, which reduces the reliability of the pooled results, thus the authors’ conservative conclusions seem appropriate.

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

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

**Research:** The authors stated that future trials conducted over longer periods and with larger samples were urgently required to develop effective programmes that would protect against weight gain in future generations. Trials in male young adults were especially needed. The usefulness of future trials may be increased by addressing nutrition, physical activity and behavioural skills for weight management, providing regular follow-up support, and by tailoring interventions to the individual level so that recommendations or advice are personally relevant.

**Funding**

Not stated.

**Bibliographic details**


**PubMedID**

22413804
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.