

## Systematic review of clinical trials on dietary interventions to prevent excessive weight gain during pregnancy among normal weight, overweight and obese women

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### CRD summary

The authors concluded that dietary advice during pregnancy appeared to be effective in decreasing total gestational weight gain and long-term postpartum weight retention. There was limited evidence for further benefits on infant and maternal health. With a small caveat regarding the unclear process of study selection, the conclusion and recommendations for research seem justified.

### Authors' objectives

To evaluate the effect of dietary interventions for preventing excessive gestational weight gain (gestational weight gain) in normal weight, overweight and obese women.

### Searching

PubMed, Cochrane Central Register of Controlled Trials (CENTRAL) and LILACS were searched to March 2011. There were no date or language restrictions. Reference lists were handsearched to identify further studies.

### Study selection

Randomised controlled trials (RCTs) and quasi-randomised controlled trials (QCTs) with a concurrent control group were eligible for inclusion. Trials needed to assess a dietary intervention designed to prevent excessive gestational weight gain or reduce pregnancy-related complications. Primary outcomes of interest were percentage of women who gained excess weight (regardless of weight gain guideline) and total or weekly gestational weight gain. Eligible secondary outcomes were maternal-related (postpartum weight retention, pre-eclampsia, gestational diabetes and caesarean section) and infant-related (low birth weight <2,500g, high birth weight or macrosomia >4,000g, pre-term birth and gestational age). Women under the age of 18, underweight and pregnant women with increased risks of insufficient weight gain or giving birth to low birth weight babies and those taking medication likely to interact with body weight were excluded.

Most studies were conducted in Western countries and in women within their first or second trimester of gestation. Interventions varied in terms of inclusion of dietary and non-dietary components. Most interventions included at least one face-to-face counselling session.

The authors did not state how many reviewers selected the studies.

### Assessment of study quality

Study quality was assessed using Cochrane criteria of randomisation, allocation concealment blinding and completeness of follow-up. Individual components were scored and studies were summarised as being at low, medium or high risk of bias.

Two reviewers independently carried out the quality assessment.

### Data extraction

Data were extracted to enable calculation of weighted mean differences (WMD) for continuous outcomes and relative risks (RR) for dichotomous outcomes, with 95% confidence intervals (CI). Intention-to-treat data were extracted where available.

Data were extracted independently by two reviewers. Disagreements were resolved by consensus.

### Methods of synthesis

Effect sizes were pooled in a fixed-effect or random-effects meta-analysis, according to the level of statistical heterogeneity. Where heterogeneity was high ( $I^2 > 50\%$ ) subgroup and sensitivity analyses were carried out for type of intervention, type of participants and excluding studies with higher risk of bias). A funnel plot was used to assess publication bias.

### Results of the review

Thirteen trials were included in the review: 10 RCTs (1,413 participants) and three QCTs (389 participants). One RCT provided unpublished data. Methods of randomisation and allocation concealment were adequate in six trials each. Completeness of follow-up was adequate in five trials. Investigators in four trials were blinded to group allocation collected outcome data. Risk of bias was considered to be high in seven trials, moderate in five trials and low in one trial.

**Primary outcomes:** Total gestational weight gain was lower in the intervention groups than control (WMD -1.92kg, 95% CI -3.65 to -0.19; 10 trials,  $I^2=89\%$ ). The effect was smaller (but remained significant) with lower heterogeneity following removal of two trials (WMD -1.01kg, 95% CI -1.58 to -0.45;  $I^2=43\%$ ). Weekly gestational weight gain reduced significantly following caloric restriction in obese/women with high weight gain (WMD -0.26kg/week, 95% CI -0.42 to -0.09; two trials,  $I^2=82\%$ ). There was no statistically significant difference between groups in terms of excess weight gain above Institute of Preventive Medicine guidelines (four trials,  $I^2=0\%$ ).

**Secondary outcomes:** The only statistically significant results were a favoured intervention effect for reduced weight retention at six months postpartum (WMD -1.90, 95% CI -2.69 to -1.12; three trials,  $I^2=63\%$ ) and in subgroup analysis that excluded one trial a lower rate of caesarean section (RR 0.75, 95% CI 0.60 to 0.94; five trials,  $I^2=0\%$ ).

There was no evidence of publication bias.

**Authors' conclusions**

Dietary advice during pregnancy appeared to be effective in decreasing total gestational weight gain and long-term postpartum weight retention. There was limited evidence for further benefits on infant and maternal health.

**CRD commentary**

The review question was clear. Inclusion criteria appeared to be sufficiently replicable. Relevant electronic data sources were accessed. Attempts were made to minimise language and publication biases. The review process included efforts to minimise error and bias for data extraction and quality assessment, but this was not clear for study selection. An appropriate quality assessment tool was used and results were variable. Study details were presented. The chosen method of synthesis seemed appropriate and took account of statistical heterogeneity.

The authors' tentative conclusion and recommendations for further research reflect the variable quality of the evidence presented. With a small caveat for the unclear process of study selection, the conclusion seems justified.

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

**Practice:** The authors indicated that not all interventions were similarly effective for women with different weight characteristics.

**Research:** The authors stated that larger trials should be conducted to confirm the results of this review. Particular consideration should be given to aspects of methodological quality. Further research should identify satisfaction and compliance with dietary interventions and consider the influence of family members as an intervention characteristic. The economic implications for the health system should be investigated in terms of the impact on long-term outcomes of reducing total gestational weight gain between 1kg and 2kg.

**Funding**

Not stated.

**Bibliographic details**

Tanentsapf I, Heitmann BL, Adegboye AR. Systematic review of clinical trials on dietary interventions to prevent excessive weight gain during pregnancy among normal weight, overweight and obese women. BMC Pregnancy and Childbirth 2011; 11(81)

**PubMedID**

[22029725](https://pubmed.ncbi.nlm.nih.gov/22029725/)

**Original Paper URL**

<http://www.biomedcentral.com/1471-2393/11/81/abstract>

**Indexing Status**

Subject indexing assigned by NLM

**MeSH**

Diet; Female; Humans; Obesity /diet therapy /prevention & control; Pregnancy; Pregnancy Complications /diet therapy /prevention & control; Randomized Controlled Trials as Topic; Weight Gain

**AccessionNumber**

12011007529

**Database entry date**

07/05/2012

**Record Status**

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