Diabetes and healthy eating: a systematic review of the literature

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CRD summary
This review examined interventions to promote healthy eating in people with diabetes. The authors concluded that, although some interventions were effective for particular outcomes, the diversity of intervention types and outcome measures made it difficult to compare them. The conclusions appear reliable but not helpful. The authors’ recommendations for improving the design of studies in this field seem appropriate.

Authors' objectives
To review the literature on healthy eating interventions for people with diabetes.

 Searching
The authors searched PubMed, CINAHL and PsycINFO for studies published in peer reviewed journals in English between 1990 and February/March 2006. Search terms were reported. The authors also electronically searched the contents of five named diabetes journals.

Study selection
Studies of interventions to promote dietary change in people with type 1 or type 2 diabetes were eligible for the review. Included studies were required to report measurements before and after intervention, and report at least one outcome related to dietary behaviour. Interventions had to include individualised assessment, development of a plan and periodic reassessment; studies comparing prescribed diets were excluded. Studies focused on specific subgroups that were not applicable to general diabetes populations were also excluded.

The majority of included studies recruited patients with type 2 diabetes. Study designs ranged from randomised controlled trials (RCTs) to case series. The studies evaluated a wide range of different interventions and reported many different outcomes, including knowledge, nutrient intake, dietary behaviour, weight, blood pressure, body mass index, biochemical measures such as haemoglobin A1c and cholesterol, and outcomes related to well-being.

Two independent reviewers selected studies for the review.

Assessment of study quality
Studies were graded A (large, well-conducted, generalisable and adequately powered RCTs), B (well-conducted cohort or case-control studies) or C (poorly controlled or uncontrolled studies).

Two reviewers assessed studies independently and resolved disagreements by discussion.

Data extraction
For each outcome, the authors reported whether the studies showed significant differences or not.

Two reviewers independently extracted data for the review.

Methods of synthesis
Studies were synthesised narratively by outcome. Differences between studies that did and did not show a significant effect of the intervention on outcomes were discussed.

Results of the review
Twenty studies (n=2,554 participants) were included in the review. Results were only summarised for outcomes measured in at least six studies. Eleven studies were graded A for quality, three were graded B and six were graded C. Many studies had too small sample size to be able to detect significant differences between groups.
For some outcomes (including reduction of weight, intake of fat and saturated fat, and carbohydrate intake) there was a tendency for interventions with a statistically significant effect to include exercise and group work. For other outcomes, there were no clear differences between successful and unsuccessful interventions.

**Authors' conclusions**
Although many studies have been designed to evaluate the efficacy of healthy eating interventions for people with diabetes, the diversity of intervention types and outcome measures made them difficult to compare.

**CRD commentary**
This review had clear but broad inclusion criteria for participants, interventions and outcomes. All study types were included, which meant that the review was not limited to the most reliable evidence. The authors searched a number of relevant databases and journals, but limiting the search to English language publications meant that some relevant studies may have been missed. Risk of publication bias was not assessed. Validity was assessed by assigning studies to a level of evidence based mainly on study design, which is not an adequate measure of risk of bias. Appropriate methods were used to reduce errors and bias during the review process.

Adequate details of included studies were presented in tables. The use of a narrative synthesis was appropriate in view of the wide range of interventions and outcomes examined. Measures of effect were not reported, which makes it difficult for readers to assess the clinical significance of the results. The authors’ conclusions reflected the limitations of the evidence and the difficulty of synthesising evidence on such a broad range of interventions and outcomes, and appear reliable, if not very helpful. Their recommendations for research 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 studies should have adequate sample sizes and should measure outcomes in all four areas recommended by the American Association of Diabetes Educators, namely learning, behaviour, clinical improvement and health status.

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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.