Effects of educational and psychosocial interventions for adolescents with diabetes mellitus: a systematic review


Authors' objectives
To examine the effectiveness of educational and psychosocial interventions for adolescents with type 1 diabetes, that were designed to improve their diabetes management.

Searching
The following databases were searched from their inception to June 1999: the Science Citation Index and Social Sciences Citation Index (via BIDS), British Nursing Index, CINAHL, the Cochrane Library, Dissertation Abstracts International, EMBASE, MEDLINE, the National Research Register, PsycLIT, Sociofile and ERIC. The search terms used were synonyms of diabetes, adolescence, types of intervention and varieties of outcomes; truncated terms were used as appropriate for each database. Further research was identified through handsearches, by contacting experts, by examining reference lists, and through publication of notices and flyers. Foreign language articles were included and no constraints were placed on the date of publication.

Study selection
Study designs of evaluations included in the review
The authors do not state any inclusion criteria with regard to the study design. The specific study designs included in the review were: randomised controlled trials (RCTs); pre-test post-test designs with no control group; studies that used a non-randomised or waiting-list control group; studies that looked at post-intervention only; case studies; and ‘other’.

Specific interventions included in the review
Papers were included if they evaluated an educational or psychosocial intervention, or if they discussed such an intervention. ‘Education’ was defined broadly to include any intervention aimed at changing diabetes-related behaviour, as well as those related more specifically to knowledge. The types of intervention included: problem-solving; skills training; education or knowledge interventions; emotional or psychological interventions; stress reduction; dietary interventions; family-related interventions; social support; knowledge; and other interventions.

Participants included in the review
The review was limited to papers that included participants with type 1 diabetes who were between 9 and 21 years of age.

Outcomes assessed in the review
The authors do not state any inclusion criteria with regard to the outcomes. The specific outcomes in the review included: glycated haemoglobin; service utilisation; knowledge or skills; independency or responsibility; blood glucose levels; other biochemical assay; other clinical assay; self-managed diet; self-managed exercise; self-managed blood glucose; self-managed insulin; other self-management; general self-management; perceived health; psychosocial individual; and psychosocial family.

How were decisions on the relevance of primary studies made?
The abstracts and full papers were independently assessed for inclusion by two reviewers. Where reviewers disagreed, the paper in question was included.

Assessment of study quality
No systematic assessment of validity was undertaken. The authors report that data on methodological quality were extracted.
Data extraction
Two reviewers extracted data on the following: study population, country, theoretical principles, nature of the intervention, interventionist, disease stage, mode of delivery, setting, type of setting, study design, methodological quality, outcomes.

Methods of synthesis
How were the studies combined?
Where possible, the effect sizes for RCTs of effectiveness were pooled. A narrative synthesis was undertaken for the remaining studies.

How were differences between studies investigated?
Differences between the included studies were discussed narratively.

Results of the review
Sixty-two studies (reported in 64 papers) were included. RCTs accounted for the largest subgroup of studies (41.9%), followed by pre-test post-test designs with no control group (33.9%). Several studies used a non-randomised control group (9.1%) and the remainder were post-intervention only (4.6%), waiting-list control group (1.6%), case studies (1.6%), or some other type of design (6.5%).

Effectiveness of the interventions.

The 25 RCTs were examined in more detail and 3 of the most effective were described in depth. The effect sizes could be calculated for 14 studies. The mean (pooled) effect size was 0.37 for psychosocial outcomes and 0.33 for glycated haemoglobin with outliers (0.08 without outliers), indicating that these interventions have small to medium beneficial effects on diabetes management outcomes.

A narrative review of the 21 pre-test post-test studies with no control group was performed. This included evaluations of interventions conducted at summer camps, interventions for poorly controlled patients and educational interventions. All studies reported beneficial effects.

Cost information
Few studies addressed the economic considerations associated with the interventions. The lack of information on the costs and diversity of the outcomes included by the investigators impeded cost-effectiveness comparisons. Shorter hospitalisation at diagnosis was at least as effective in achieving control and avoiding complications in adolescence as longer stays. Home care may result in improved outcomes but may not be cheaper than hospital care at diagnosis. Targeting poorly controlled patients may reduce adverse events and hospitalisations, and may be more cost-effective than generic interventions.

Authors’ conclusions
Educational and psychosocial interventions have small to medium beneficial effects on various diabetes management outcomes. The quantitative and narrative analysis of the evidence suggested that interventions are more likely to be effective if they demonstrate the inter-relatedness of the various aspects of diabetes management. To reap economic returns, the interventions need to show durable effects on behaviour and metabolic control.

CRD commentary
The papers were selected for this review on the basis of broad but appropriate inclusion criteria. Extensive searches of databases of published literature and other sources were undertaken to identify relevant evidence. The individual studies were presented in reasonable detail, and the approach taken to combine these studies was appropriate. However, although certain aspects of methodological quality were discussed in the review, the validity of the individual studies was not assessed in any systematic manner.
The authors’ conclusions regarding the need for well-conducted research were appropriate.

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

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

Research: The authors recommend ‘a phase of programme development be undertaken involving a consultation process with adolescents with type 1 diabetes, their families, doctors, nurses, health economists and health psychologists’. They also make several recommendations about how future primary research should be conducted.

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