

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

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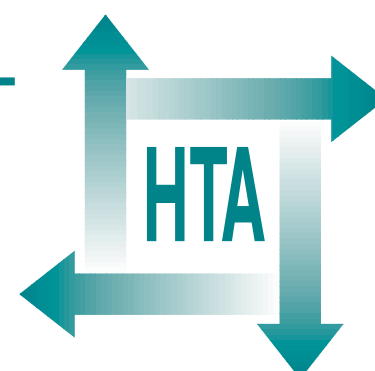
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Executive summary

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Executive summary

Background

Insulin-dependent diabetes mellitus, also known as type 1 diabetes, is a life-threatening condition and is the third most common chronic illness among young people. As a result of minimal or non-existent insulin production, people with diabetes must take over the normally automatic task of regulation of blood glucose levels. This is achieved by a complex regimen involving multiple, daily administrations of insulin coordinated with dietary intake and energy expenditure and monitored by blood glucose testing.

Objectives

To examine the effectiveness of educational and psychosocial interventions for adolescents with type 1 diabetes designed to improve their diabetes management. Specifically, it addressed the following research questions:

1. Do educational and psychosocial interventions for adolescents with type 1 diabetes have beneficial effects on biological and psychosocial outcomes?
2. Are there types or features of interventions that have been shown to be more effective than others?
3. What evidence is there of the cost-effectiveness of interventions?

Methods

A search strategy was formulated, piloted and refined. Three journals were handsearched, 11 electronic databases were searched and personal contacts, flyers, conferences and websites were used to notify the research community of the review to access further literature. This process generated 10,535 abstracts, which, after screening, resulted in 367 articles identified for retrieval. This number was augmented by hand-searching, personal contact and exploding references, and a final total of 457 articles were scrutinised. Of these, 64 reports describing 62 studies were identified as empirical papers evaluating educational or psychosocial

interventions. The relevant data were extracted from the papers and summary tables for each study were prepared. Where possible, effect sizes were computed for outcomes from studies that included a randomised control group (CG) and other relevant information.

Results

A descriptive analysis of the 62 studies was undertaken. Most studies (67.7%) were conducted in the USA and 41% were randomised controlled trials (RCTs), none of which were UK-based. Only 48% of the reports provided an explicit theoretical rationale for the intervention. The mean number of participants was 53.8. The studies took place in various settings, evaluated a variety of interventions, involved various interventionists, addressed various components and assessed the effects by a range of outcomes, including measures of metabolic control and psychological and behavioural outcomes. Follow-up assessments were relatively rare.

The effectiveness of interventions

The 25 RCTs were examined in more detail and three of the most effective were described in depth. Effect sizes could be calculated for 14 studies. The mean (pooled) effect size for psychosocial outcomes was 0.37 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–post studies with no CG was performed, including evaluations of interventions conducted at summer camps, interventions for poorly controlled patients and educational interventions. All studies reported beneficial effects.

Cost-effectiveness

Few studies addressed economic considerations associated with interventions, and the lack of information on costs and the diversity of outcomes included by investigators impeded cost-effectiveness comparisons. Shorter hospitalisation at diagnosis is 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 subjects may reduce adverse events and hospitalisations and may be more cost-effective than generic interventions. There is a need for rigorous cost-effectiveness studies of educational and psychosocial interventions for adolescents with type 1 diabetes that include longer-term considerations.

Conclusions

The following conclusions were drawn from this review:

1. Educational and psychosocial interventions have small to medium beneficial effects on various diabetes management outcomes.
2. Well-designed trials of such interventions are needed in the UK (no completed RCTs of educational or psychosocial interventions for adolescents with type 1 diabetes conducted in the UK were found).
3. The evidence, arising primarily from studies in the USA, provides a starting point for the design of interventions in the UK.
4. 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. The effectiveness of interventions should be evaluated by assessing outcomes that the intervention explicitly targets for change, and at the appropriate point in time post-intervention to reflect the impact of the intervention.
5. Interventions need to be evaluated by well-designed studies, such as RCTs, including adequately powered patient-preference trials reporting results in such a way as to enable effect sizes to be calculated.
6. An important gap in the evidence is that there is no systematic understanding of whether interventions should be targeted (e.g. modified for different disease stages, different types of diabetes management problems or the different age groups subsumed by adolescence).
7. To reap economic returns, interventions need to show durable favourable effects on behaviour and metabolic control, but there is a lack of cost-effectiveness studies that fully address the resource implications of educational interventions for adolescents and long-term consequences.

Recommendations for further research

Research to date has proceeded piecemeal instead of cumulatively. Given the absence of high quality UK-based studies, a programme of primary research on adolescent interventions should be developed. This review recommends that 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. This consultation exercise would enable the establishment of possible interventions that are seen as plausible and potentially effective by patients and their parents, feasible and practical in the context of the NHS diabetes services and understood and accepted by doctors and nurses as key and integral parts of diabetes care. The interventions would also need to have the potential to be cost-effective and be based on sound behavioural principles. Such interventions, if subsequently demonstrated by commissioned research to be effective, would be much more likely to be implemented than ones developed without such a process.

Publication

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NHS R&D HTA Programme

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Initially, six HTA panels (pharmaceuticals, acute sector, primary and community care, diagnostics and imaging, population screening, methodology) helped to set the research priorities for the HTA Programme. However, during the past few years there have been a number of changes in and around NHS R&D, such as the establishment of the National Institute for Clinical Excellence (NICE) and the creation of three new research programmes: Service Delivery and Organisation (SDO); New and Emerging Applications of Technology (NEAT); and the Methodology Programme.

This has meant that the HTA panels can now focus more explicitly on health technologies ('health technologies' are broadly defined to include all interventions used to promote health, prevent and treat disease, and improve rehabilitation and long-term care) rather than settings of care. Therefore the panel structure has been redefined and replaced by three new panels: Pharmaceuticals; Therapeutic Procedures (including devices and operations); and Diagnostic Technologies and Screening.

The HTA Programme will continue to commission both primary and secondary research. The HTA Commissioning Board, supported by the National Coordinating Centre for Health Technology Assessment (NCCHTA), will consider and advise the Programme Director on the best research projects to pursue in order to address the research priorities identified by the three HTA panels.

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