Psychological interventions to improve glycaemic control in patients with type 1 diabetes: systematic review and meta-analysis of randomised controlled trials

Winkley K, Ismail K, Landau S, Eisler I

CRD summary
This review assessed the effectiveness of psychological therapies in improving glycaemic control in type 1 diabetes. The authors concluded that there is weak evidence for the effectiveness of psychological treatments in improving glycaemic control in children and adolescents but not adults. The authors’ conclusions are appropriate, given the evidence presented, and are likely to be reliable.

Authors’ objectives
To assess the effectiveness of psychological therapies in improving glycaemic control in type 1 diabetes.

Searching
MEDLINE, EMBASE, PsycINFO and the Cochrane CENTRAL Register were searched up to September 2004 (search strategy provided) without language restrictions. Conference proceedings of the American Diabetes Association, Diabetes UK, European Association for the Study of Diabetes and the International Diabetes Federation were also searched (1997 to 2004). The reference lists of included studies and reviews were checked, and experts in the field and authors of included studies were contacted for data.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials were eligible for inclusion. The duration of follow-up was 11.4 months (SD=7.0) for studies of children and adolescents and 7.2 months (SD=4.8) for studies of adults.

Specific interventions included in the review
Trials comparing a psychological intervention (of at least one session) to a non psychological control (usual care, education, attention control or waiting list) or a less intensive psychological treatment were eligible for inclusion. The included studies used supportive or counselling therapy, cognitive-behaviour therapy (CBT) or family systems therapy. The most common mode of delivery for children and adolescents was through multiple family or parent group; the most common mode of delivery for adults was group or a combination of group and individual therapy.

Participants included in the review
Children, adolescents and adults with a diagnosis of type 1 or insulin-dependent diabetes were eligible for inclusion. The children and adolescent group were mainly adolescents and the mean duration of diabetes was 5.6 years (standard deviation, SD=2.07). The mean duration of diabetes in the adult group was 14.1 years (SD=6.85) and the clinical subgroups were suboptimal glycaemic control, new onset diabetes, complications and obesity.

Outcomes assessed in the review
The main outcome of interest was long-term glycaemic control (measured by percentage of glycated haemoglobin using a range of methods). The subsidiary outcome of interest was psychological distress (measured by a range of different continuous assessment questionnaires).

How were decisions on the relevance of primary studies made?
Two authors independently screened studies for eligibility. Any disagreements were resolved through discussion and consensus.

Assessment of study quality
Trials were assessed for selection bias, attrition bias and detection bias. Studies were classified on the basis of number of quality criteria met: category A, all criteria met (low risk of bias); category B, one or more criteria partially met (moderate risk of bias); category C, one or more criteria not met (high risk of bias). Although not explicitly stated, two
authors appear to have conducted independent assessments of quality.

**Data extraction**
Two authors independently extracted the data. For the two outcomes of interest, the standardised mean difference (SMD) (based on change scores from baseline to follow-up) and standard error were calculated for each study. Where there were several follow-up periods, the longest time period was used. For crossover trials, only the first arm was included.

**Methods of synthesis**
How were the studies combined?
Studies were stratified on the basis of whether they were of adults or of children and adolescents, and a pooled SMD and 95% confidence interval (CI) estimated using a random-effects model. Publication bias was assessed for the main outcome using a funnel plot and Begg's adjusted rank correlation test.

How were differences between studies investigated?
Cochran's Q test was used to assess statistical heterogeneity. For sensitivity analyses, family therapy for children and adolescents and CBT for adults were each pooled separately.

**Results of the review**
Twenty-nine RCTs were included: 16 (n=1,073) of children and adolescents and 13 (n=636) of adults. Of these, 10 and 11 RCTs respectively were included in the quantitative analysis.

Only 2 studies were classified as having a low risk of bias.

**Glycaemic control.**
The pooled estimate for children and adolescents (based on 10 RCTs) was small to moderate (SMD -0.35, 95% CI: -0.66, -0.04, p=0.03); this translated into an absolute reduction of 0.48% (95% CI: 0.05, 0.91). The test for heterogeneity was statistically significant (p=0.002). When family therapy for children and adolescents was pooled separately, the effect size was slightly larger.

The pooled estimate for adults (based on 11 RCTs) was small (SMD -0.17, 95% CI: -0.45, 0.10, p=0.22); this translated into an absolute reduction of 0.22% (95% CI: -0.13, 0.56). The test for heterogeneity was statistically significant (p=0.02). When CBT for adults was pooled separately, the effect size was smaller.

**Psychological distress.**
The pooled estimate for children and adolescents (based on 4 RCTs) was moderate (SMD -0.46, 95% CI: -0.83, -0.10, p=0.013). The pooled estimate for adults was small (SMD -0.25, 95% CI: -0.51, 0.01, p=0.059). The test for heterogeneity was not statistically significant.

**Authors' conclusions**
There is weak evidence for the effectiveness of psychological treatments in improving glycaemic control in children and adolescents but not adults.

**CRD commentary**
There was a clearly stated review question. Several appropriate sources were searched without language restrictions for published and unpublished studies, thereby minimising publication bias. Appropriate review methods were also used to minimise error and bias in the study selection, quality assessment and data extraction processes. The analyses seemed appropriate and statistical heterogeneity was assessed, though the source of the heterogeneity was not fully investigated. The authors' conclusions are appropriate, given the evidence presented, and are likely to be reliable.

**Implications of the review for practice and research**
Practice: The authors did not state any implications for practice.
Research: The authors stated that further research is required to develop and refine the theoretical models underpinning psychological interventions for diabetes, and should incorporate patient preferences and examine which therapies are effective for specific subgroups of patients.

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