The cost-effectiveness of cognitive behavior therapy for borderline personality disorder: results from the BOSCOT trial


Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
The use of cognitive-behavioural therapy (CBT) added to treatment as usual (TAU) for patients with borderline personality disease (BPD). The CBT was offered with an average of 27 sessions.

Type of intervention
Treatment.

Economic study type
Cost-utility analysis.

Study population
The study population comprised patients aged between 18 and 65 years who met criteria for at least five items of BPD using the Structured Clinical Interview for DSM IV Axis II Personality Disorders (SCID-II), and who had received either inpatient psychiatric services or an assessment at accident and emergency services or an episode of deliberate self-harm (either suicidal act or self-mutilation) in the previous 12 months. Patients were excluded if they were receiving inpatient treatment for a mental state disorder, or were receiving a systematic psychological therapy or specialist service (particularly psychodynamic psychotherapy). Those who had evidence of an organic illness, mental impairment, alcohol or drug dependence, schizophrenia or bipolar disorder were also excluded.

Setting
The setting was secondary care. The economic study was carried out in the UK.

Dates to which data relate
The effectiveness and resource use data were derived from a study published in 2006. The costs were expressed using 2003/04 prices.

Source of effectiveness data
The effectiveness evidence was derived from a single study.

Link between effectiveness and cost data
The costing was carried out prospectively on the same sample of patients as that included in the effectiveness study.

Study sample
Power calculations were not reported. Eligible patients able to give consent and to understand the treatment approach were included. A sample of 106 patients was enrolled, of which 54 were in the CBT+TAU group and 52 in the TAU.
group. Other details on the study sample were not reported.

**Study design**
This was a prospective, randomised clinical trial that was carried out in three UK centres (Glasgow, London and Ayrshire/Arran). The length of follow-up was 2 years. Trained research assistants who were blinded to treatment condition conducted the assessment interviews. The patients were assessed at baseline (before randomisation) and then in face-to-face interviews every 6 months.

**Analysis of effectiveness**
The analysis of the clinical study was conducted on an intention to treat basis. The method of multiple imputation was used to deal with missing data. The primary clinical endpoint used in the current economic evaluation was the variation in health-related quality of life. This was estimated using the EuroQol (EQ-5D) instrument, a standardised generic tool comprising five health dimensions. The main clinical measure used in the primary trial was a composite measure of three elements: suicidal acts, inpatient psychiatric hospitalisations, and accident and emergency attendance. The authors did not discuss the baseline comparability of the study groups, but the randomised design of the study suggests that the two groups were not statistically different at baseline. In addition, differences in mean quality-adjusted life-years (QALYs) between the two groups at follow-up were adjusted for differences in baseline EQ-5D scores.

**Effectiveness results**
The mean EQ-5D scores in the TAU and CBT+TAU groups were:

- **Baseline:** 0.5233 (+/- 0.3578) and 0.4872 (+/- 0.3656) for TAU and CBT+TAU, respectively.
- **6 months:** 0.5793 (+/- 0.3640) and 0.4916 (+/- 0.3230) with an adjusted difference of -0.0757, 95% confidence interval (CI): -0.1918 to 0.0404.
- **12 months:** 0.6048 (+/- 0.3737) and 0.5098 (+/- 0.4535) with an adjusted difference of -0.0763, 95% CI: -0.2306 to 0.0779.
- **18 months:** 0.6797 (+/- 0.3067) and 0.6206 (+/- 0.3304) with an adjusted difference of -0.0763, 95% CI: -0.1616 to 0.0657.
- **24 months:** 0.6550 (+/- 0.3493) and 0.6033 (+/- 0.3877) with an adjusted difference of -0.0402, 95% CI: -0.1685 to 0.0880.

The mean odds ratio based on the composite measure for CBT+TAU over TAU alone was 0.70 (95% CI: 0.38 to 1.31; p=0.27). This showed that the two treatment arms were similarly effective.

A significant reduction in the number of suicidal acts was reported in favour of CBT (mean odds ratio -0.91, 95% CI: 1.67 to -0.17; p=0.02).

**Clinical conclusions**
The effectiveness analysis showed that, on average, health-related quality of life was slightly lower in the intervention group than in the control group. However, the difference was small and did not reach statistical significance. In general, the two treatments were similarly effective.

**Measure of benefits used in the economic analysis**
The summary benefit measure used was the number of QALYs. These were derived directly from the effectiveness analysis using EQ-5D values. An annual discount rate of 3.5% was used to assess the present values of future benefits.

**Direct costs**
The cost analysis considered the viewpoint of patients, the NHS and Social Services. It included hospital services...
(inpatient and outpatient services, day patient, accident and emergency services), primary care, community-based services, travel expenses, criminal justice services, childcare and accommodation. CBT treatment costs (therapists and overheads) were included only in the intervention group. The unit costs and the resource quantities were presented separately. Resource use was estimated prospectively alongside the clinical trial. Hospital data were derived from the patient's hospital records. The quantities of non-hospital resources were estimated using an adapted version of the Client Service Receipt Inventory (CSRI). The unit costs for hospital services came from local estimates derived from NHS sources. The costs of non-medical services were derived directly from the CSRI. CBT treatment costs were based on salary scales for therapists. Discounting was relevant, as the costs were incurred during 2 years, and an annual rate of 3.5% was used. All unit costs were adjusted to 2003/04 prices using the relevant price indices.

**Statistical analysis of costs**
Non-parametric statistical tests were used to test for differences in costs between the groups. Multiple imputation was used for missing cost data.

**Indirect Costs**
The indirect costs were not considered in the economic analysis.

**Currency**
UK pounds sterling (£).

**Sensitivity analysis**
Deterministic sensitivity analyses were not performed. Bootstrapping was performed to generate CIs around the mean cost-effectiveness estimates, and acceptability curves were presented.

**Estimated benefits used in the economic analysis**
The expected QALYs were 1.2042 (+/- 0.4724) in the TAU group and 1.0633 (+/- 0.5614) in the CBT+TAU group. The adjusted difference was -0.1082 (95% CI: -0.2613 to 0.0449), which did not reach statistical significance.

**Cost results**
The baseline costs were significantly higher in the TAU group than in the CBT+TAU group. Thus, the follow-up costs were adjusted for this difference.

The total costs after 2 years’ treatment were 18,356 (+/- 38,165) in the TAU group and 12,785 (+/- 16,062) in the CBT+TAU group. However, the mean difference adjusted for differences in baseline costs was -689 (95% CI: -8,166 to 6,787).

The costs were not significantly different when sub-categories of items were considered, although a trend towards higher hospital costs for TAU was found.

**Synthesis of costs and benefits**
An incremental cost-utility ratio was calculated in order to combine the costs and benefits of the two strategies.

The incremental cost per QALY gained for TAU compared with CBT+TAU was 6,376. This means that CBT+TAU would be cost-effective only if the NHS were willing to pay less than this amount for an additional QALY. However, the bootstrap analysis revealed that there was considerable uncertainty surrounding the differences in costs and benefits of the two treatments.

The use of a cost-effectiveness acceptability curve indicated that the probability that CBT+TAU was cost-effective fell
as the amount the NHS was willing to pay for additional health benefits rose. For example, if the NHS were willing to pay 2,000 per QALY, then the probability that CBT was cost-effective would be 53%. At a willingness-to-pay of 50,000, this probability fell to approximately 20%.

Authors’ conclusions
No statistically significant difference in costs or benefits was observed between the cognitive-behavioural therapy (CBT) plus treatment as usual (TAU) group and TAU alone. On average, CBT+TAU was found to be marginally less effectively but also less expensive than TAU alone. In general, the use of CBT for patients with borderline personality disorder (BPD) does not appear to demonstrate any significant cost-effectiveness advantage over usual care.

CRD COMMENTARY - Selection of comparators
The rationale for the choice of the comparator was clear in that the new intervention was compared with usual care as delivered in the authors' setting. More details on CBT and TAU were presumably provided in the primary study. You should decide whether these are valid comparators in your own setting.

Validity of estimate of measure of effectiveness
The effectiveness evidence came from a clinical trial, which was appropriate for the study question. The validity of the primary estimates was ensured by the randomised and multi-centred design, the use of intention to treat, and the blinded assessment of clinical outcomes. These characteristics of the study should reduce the potential impact of selection and assessment bias. Further, the authors took the loss to follow-up into consideration using a statistical approach to deal with missing data. Finally, the authors adjusted difference in clinical outcomes at follow-up by baseline differences. However, most of the information on the analysis of effectiveness was reported in a separate paper, thus it was not possible to evaluate all aspects of the current analysis.

Validity of estimate of measure of benefit
The use of QALYs as the summary benefit measure was appropriate in that they capture the impact of the intervention on quality of life and can be compared with the benefits of other health care interventions. The authors justified the choice of QALYs as the most valid and appropriate measure. Discounting was performed using the recommended rate. The authors noted that the lack of a significant difference in QALYs might have been due to the use of a generic instrument such as the EQ-5D to assess the impact of health-related quality of life.

Validity of estimate of costs
The authors explicitly stated the perspective of the study. The cost categories included reflected the broad viewpoint of the analysis. The authors clearly reported all cost items and their sources in terms of both resource consumption and unit costs. Extensive information on the resources actually consumed in the sample of patients was provided, which enhances the possibility of replicating the analysis in other settings. Typical UK sources were used to derive the unit costs. Statistical analyses were carried out given the non-normal distribution of the costs. However, the cost estimates were specific to the study setting and the use of alternative costs was not explicitly investigated in the sensitivity analysis. The price year was reported, which will facilitate reflation exercises in other settings.

Other issues
The authors did not make extensive comparisons of their findings with those from other studies, but stated that the economic and clinical impact of CBT had not yet been comprehensively assessed. The issue of the generalisability of the study results to other settings was not explicitly addressed, and the external validity of the analysis may be low as no sensitivity analysis around the cost estimates was performed. The authors noted some limitations of their analysis. First, it was acknowledged that it was difficult to engage therapy in this specific group of patients, thus the level of therapy might not have been sufficient to generate an apparent benefit. Second, the length of the follow-up period might not have been long enough to demonstrate the long-term benefits of CBT.
Implications of the study
The study results do not support the use of CBT for the treatment of patients with BPD. The authors suggested that further research should evaluate the validity of the generic EQ-5D instruments for patients with BPD.

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