



Brief report

Taking computerized CBT beyond primary care

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Objectives. This study seeks to determine whether the effectiveness of *Beating the Blues* (*BtB*), an established computer-based CBT (CCBT) programme, can extend beyond primary care.

Design. *BtB* was delivered and evaluated in an NHS specialist CBT care centre as part of routine care.

Method. A sample of 104 service users, typically displaying chronic levels of depression and/or anxiety received CCBT.

Results. Completers' scores on the Clinical Outcomes in Routine Evaluation-Outcome Measure (CORE-OM), as well as on single-item rating scales for anxiety and depression, improved significantly following the intervention. Statistically significant differences held during intention-to-treat analyses. Almost half of the completer sample achieved reliable and clinically significant change. The results were benchmarked against national data sets.

Conclusions. These preliminary findings suggest a potential role for CCBT within secondary care as a first step, self-help treatment tool for anxiety and depression.

Depression, with or without anxiety, is the most prevalent form of mental disorder in the UK (Psychiatric Morbidity Report, 2000). Cognitive Behavioural Therapy (CBT) is recommended as the treatment of choice for depression and anxiety (National Institute of Health and Clinical Excellence [NICE], 2004a,b; Roth & Fonagy, 2004). However, a severe lack of trained therapists to meet the rising demands for 'talking therapies' for common mental health problems (Goldberg & Gournay, 1997; London School of Economics, 2006) has created a need for the development and evaluation of alternate and acceptable forms of treatment delivery.

Guided self-help in the form of computer-based CBT (CCBT) programmes could help to ameliorate the situation. *Beating the Blues* (*BtB*) is an interactive multimedia CBT programme, recommended by NICE (2006) as the treatment of choice for

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mild-to-moderate levels of depression in primary care. However, there is little evidence regarding the effectiveness of *BtB* in secondary mental healthcare services. Therapeutic resources in these services are just as limited and service users are often more chronically depressed, exhibiting more psychiatric comorbidity, and have poorer prognoses (Simon & Von Korff, 1995) than in primary care. The present study aims to address the paucity of evidence at this level of mental healthcare by examining the impact of *BtB* in an NHS specialist CBT centre.

Whilst depression and anxiety constitute the principal reasons for referral to CCBT, service users often exhibit a diverse range of problems including the presence of comorbid general medical or psychiatric disorder and chronic social and vocational impairment. Given the multiplicity of difficulties experienced by service users, this study digresses from using condition-specific measures that merely provide information about the presence or absence of a disorder. Instead, a premium is placed on utilizing an outcome measure that reflects service users' functioning and well-being. Furthermore, the naturalistic non-randomized design acknowledges that for those involved in planning, funding, and delivering CCBT in specialist care centres, the key question is: what kind of service user treatment outcomes can be realistically expected? Traditional randomized controlled trials (RCTs), with their narrower participant inclusion and rigorous implementation criteria, do not necessarily generate findings that accurately reflect routine everyday practice (Westbrook & Kirk, 2005).

Method

Design

This was a naturalistic open study of an eight-session CCBT programme, *Beating the Blues*. Service users on a waiting list for face-to-face CBT at an NHS specialist CBT unit in Essex were offered the opportunity to receive CCBT. Baseline data was collected prior to the first session and compared to outcome data collected after completion of the eighth session. Service user satisfaction data was collected at the end of users' final *BtB* session.

Participants

BtB was offered to adult service users suffering from anxiety and/or depression, who had been referred with mental health issues to a CBT therapist for clinical assessment. Service users were excluded if they were: actively suicidal, drug or alcohol dependent, unmotivated or ambivalent about treatment, diagnosed primarily with OCD or an organic mental disorder, not literate in English, or currently receiving psychotherapy. Risk was not screened via a psychometric tool but was assessed during interview by a CBT therapist. Ultimately, 75% of users referred with depression and/or anxiety were deemed as appropriate for treatment. There were approximately 2-3 months waiting time between assessment and starting *BtB*. A sample of 104 service users (66 females and 38 males) used *BtB* from October 2005 and October 2006. Ages ranged from 19 to 70 years (mean = 39.5, $SD = 11.6$). Most service users reported problem duration (duration of experienced anxiety and/or depression, whether cycling episodes or continuous) of greater than 10 years (28.8%). The median period of problem duration was 5-10 years. Of the 100 users returning information regarding treatment history, 80% indicated that they had taken prescribed medication prior to treatment, 12% had received NHS

counselling or psychotherapy, 3% had attended anxiety management groups, and 5% had received no previous treatment whatsoever.

The CBT specialist service

The service receives referrals from both primary and secondary care. Its catchment population is a mixture of urban and rural based, of which the majority is white middle and working class. A whole time equivalent of four CBT therapists work at the centre. *BtB* was implemented as part of the service in May 2001.

Treatment

BtB consists of 8 hour-long interactive therapy sessions. Each session integrates cognitive and behavioural techniques and administers weekly homework assignments. Clinical progress reports, including suicide risk indicators, are printed out after each session. Sessions took place in a private room with minimal supervision. These sessions did not include any face-to-face work with a CBT therapist.

Outcome measures

The standardized *Clinical Outcomes in Routine Evaluation-Outcome Measure* (CORE-OM; Mellor-Clark, Barkham, Connell, & Evans, 1999) was completed electronically before the first session began, and again on completion of the final session. The CORE-OM has become a widely utilized self-report measure in service settings providing psychological treatments. Its suitability and utility for assessing the severity of the presenting problems has been demonstrated in both primary and secondary care-based services (Barkham, Gilbert, Connell, Marshall, & Twigg, 2005). The CORE-OM questionnaire consists of 34 items, with ratings of 0–4, addressing the dimensions of subjective well-being, problem/symptom severity (including four items relating to depression and four items relating to anxiety), life functioning, and risk to self and others.

In addition, a Subjective Units of Disturbance Scale (SUDS) was administered electronically pre- and post-*BtB*. SUDS represents a quick ‘litmus test’ to assess mood. Individuals mark how anxious and depressed they have been during the previous week on scales of 0–8, where 0 denotes ‘not at all’, and 8 denotes ‘extremely’. Quick single-item mood scales, whether rated by service user or by clinician, are seen as a reasonable guide to mood and save time compared to traditional measures (McKenzie & Marks, 1999).

Service user satisfaction with *BtB* was measured via three similar rating scales looking at usefulness, relevancy, and ease of use (0, ‘not at all’, 8, ‘extremely’).

Analysis

Paired two-tailed *t* tests were used to analyse normally distributed data from users completing both pre- and post-treatment measures. Due to the non-normality of their distribution, a Wilcoxon’s signed-rank test was used to calculate the significance of difference between the pre- and post-*risk* scores. Additionally, intention-to-treat analyses employing the last observation carried forward (LOCF) method was used to impute the outcomes of users who had dropped out. Uncontrolled pre- and post-effect sizes were calculated to establish the magnitude and direction of the treatment’s effect. The mean and standard deviation of the satisfaction scores were also calculated for all three rating scales.

The percentage of users meeting both reliable and clinically significant change criteria is also presented. In accordance with Mullin, Barkham, Mothersole, Bewick, and Kinder (2006), reliable improvement was noted when users evidenced an increase of 0.5 or more on the CORE-OM mean score following intervention. Reliable deterioration was recorded when users' post-intervention CORE-OM mean scores increased by 0.5 from pre-intervention. Reliable and clinically significant improvement was registered when a user improved by 0.5 or more in the CORE-OM mean score and moved from above the clinical cut-off to below it. Connell *et al.* (2007) established that a CORE mean score of 1.0 is the cut-off between the clinical population and a sample drawn from the general population. This clinical cut-off was applied to the present data.

Results

Adherence rates

From October 2005 to October 2006, 68.3% of service users completed all eight sessions of *BiB*. The mean number of sessions per user (including completers) was 6.7 ($N = 102$). The mean number of sessions for non-completers was 3.8 ($N = 31$). There was no significant difference between completers and non-completers with regards to age, male-to-female ratio, or mean pre-CORE and pre-SUDS scores.

Treatment outcomes

Statistical significance and effect size of change

Pre-post analyses revealed statistically significant improvements in service users' scores on all four dimensions of the CORE-OM. The mean fall in the total CORE-OM item mean score was 0.82 points ($t(69) = 10.52, p < .001$), with an uncontrolled pre- and post-effect size of 1.26 [0.97-1.64, 95% CI]. Statistically significant differences were less dramatic, but maintained nonetheless, by intention-to-treat analyses. The total CORE-OM intention-to-treat mean score fall was 0.54 ($t(103) = 8.28, p < .001$), equating to an

Table 1. Comparison (paired sample *t* test or Wilcoxon-signed ranks) of CORE-OM domain scores pre-*Beating the Blues* and after the eighth session ($N = 70$) and also the LOFC intention-to-treat analysis ($N = 104$)

	Pre-Beating the Blues mean (SD)	Post-Beating the Blues mean (SD)	$t(p)$ or $T(p)$	ES	95% CI for ES
Completers					
Well-being	2.28 (0.79)	1.25 (0.79)	9.52 (<.001)	1.30	0.84-1.45
Problems	2.16 (0.78)	1.10 (0.65)	10.87 (<.001)	1.36	1.03-1.72
Functioning	1.79 (0.76)	0.99 (0.60)	9.08 (<.001)	1.05	0.79-1.42
Risk	0.38 (0.47)	0.13 (0.28)	85.50 (<.001)	0.53	0.36-0.90
All items	1.73 (0.65)	0.91 (0.52)	10.52 (<.001)	1.26	0.97-1.64
Intention-to-treat					
Well-being	2.17 (0.85)	1.47 (0.89)	7.98 (<.001)	0.82	0.54-0.99
Problems	2.04 (0.83)	1.33 (0.80)	8.73 (<.001)	0.86	0.63-1.10
Functioning	1.74 (0.75)	1.20 (0.70)	7.72 (<.001)	0.72	0.52-0.98
Risk	0.35 (0.46)	0.18 (0.34)	85.50 (<.001)	0.37	0.27-0.69
All items	1.65 (0.66)	1.11 (0.63)	8.28 (<.001)	0.82	0.58-1.04

uncontrolled pre- and post-effect size of 0.82 [0.58–1.04, 95% CI]. Table 1 presents all the CORE-OM dimension mean scores for both completer and intention-to-treat analyses and the 95% confidence intervals for effect sizes.

Looking more closely at pre-post changes in service users' levels of anxiety and depression, the completer sample's SUDS data revealed a 2.16 point reduction in anxiety scores ($t(30) = 4.22, p < .001$), with an uncontrolled pre- and post-effect size of 0.99, and a 2.00 point reduction in depression scores ($t(30) = 4.82, p < .001$), with an uncontrolled pre- and post-effect size of 0.78. For intention-to-treat analyses, anxiety scores fell by 1.48 points ($t(60) = 4.04, p < .001$), equating to an uncontrolled pre- and post-effect size of 0.68, and depression scores fell by 1.33 points ($t(60) = 4.51, p < .001$), equating to an effect size of 0.63.

Clinical and reliably significant change

Clinical and reliable change analyses were only carried out on service users' data when their pre-*BtB* CORE-OM mean scores indicated clinical caseness (above the cut-off of 1.0). Fifteen (21.4%) completers demonstrated no reliable change, 45 (64.3%) reliable change, and 1 (1.4%) reliably deteriorated; 34 (48.6%) completers achieved both reliable and clinically significant change. Intention-to-treat analyses found 38 (36.5%) service users showing no reliable change, 45 (43.3%) demonstrating reliable change, and 1 (1.0%) reliable deterioration; 34 (32.7%) achieved both reliable and clinically significant change.

Satisfaction outcomes

The means and standard deviations for how useful, relevant, and easy to use, the users found *BtB* were as follows: *usefulness* 5.34 ($SD = 1.69$), *relevancy* 5.22 ($SD = 1.98$), and *ease of use* 5.23 ($SD = 5.13$).

Discussion

This study presents findings on the first CCBT programme to be implemented as an integral part of care in an NHS specialist CBT service. The results suggest that this form of treatment delivery in a CBT specialist centre can yield significant therapeutic gains for patients suffering from depression and anxiety. Large pre- and post-effect sizes, greater than 0.8 (Cohen, 1988) were obtained on the overall CORE-OM score for both completers and the entire participant sample; and medium-to-large pre- and post-effect sizes were produced by SUDS scores which looked specifically at service users' levels of anxiety and depression. Moreover, nearly half of completers achieved reliable and clinically significant change and were therefore considered clinically 'recovered'.

Despite these encouraging results, the more sceptical researcher might contend that without a control group it is difficult to conclude that the positive clinical outcomes were absolutely attributable to the CCBT intervention. However, alternate explanations such as possible spontaneous remission or the therapeutic effects of medication seem improbable. All but one service user reported symptom duration in excess of 6 months, rendering it highly unlikely that improvements observed during treatment were a result of spontaneous recovery. With regards to medication use, a considerable body of evidence indicates that the largest improvement in the symptoms of depression and anxiety per unit time produced by antidepressants occurs within the first 2 weeks of

treatment (Parker *et al.*, 2000; Posternak & Zimmerman, 2005; Strassen, Angst, & DeliniStula, 1997). Given the 2–3 month delay from referral by GP to assessment, and the 3–4 month delay between accepting a place on the CCBT programme and actually starting the first session, it is likely that any relief gleaned from pharmacological therapy would have taken place before, rather than during, the *BtB* intervention.

The results of the present study can be further bolstered by benchmarking findings against the national CORE-OM database of CORE-OM outcome scores for primary and secondary care counselling/therapy services (Barkham *et al.*, 2005; Evans, Connell, Barkham, Marshall, & Mellor-Clark, 2003). The overall CORE-OM item mean at baseline for completers in the present sample was 1.73, which corresponds closely to data for intake at secondary care services (CORE-OM = 1.81 [$N = 1,918$]; Barkham *et al.*, 2005). For the current completer group, the degree of change on the CORE-OM mean score fell short of those seen in a large national primary care sample (uncontrolled pre- and post-treatment effect size = 1.51; Barkham *et al.*, 2006), but exceeded those noted for a secondary care sample (Evans *et al.*, 2002) (uncontrolled pre- and post-treatment effect size 0.71). In addition, the percentage of completers attaining reliable and clinically significant change is approximately two-thirds of that reported in a primary care counselling/therapies data set (Barkham *et al.*, 2006). The implication is that outcomes for computerized CBT offered in routine care are comparable to those observed for face-to-face CBT. These findings challenge the view held by Richardson and Richards (2006) that CBT-based self-help materials are of limited value because they lack the common ingredients of personal therapeutic encounters.

Also noteworthy is the high adherence rate (68.3%) observed in the current study. Comparatively, in the primary care sample of the CORE-OM database (Evans *et al.*, 2002), 61% of service users completed the treatment programme, whilst in Cavanagh *et al.*'s (2006) and Proudfoot *et al.*'s (2004) CCBT trials, the completion rates were 62 and 70%, respectively. The mean satisfaction ratings also support *BtB*'s acceptability to service users. However, mean scores of at least 7 would be desirable, implying that there is definitely room for *BtB* to be improved upon.

Focussing on this study's limitations, it needs to be highlighted that our findings are preliminary. An RCT with an enlarged sample size and follow-up data is required to corroborate whether the improvements seen here are indeed attributable to the intervention itself. The present study also employed the LOCF method of dealing with missing data to enable an intention-to-treat analysis. Although this method can guide practitioners as to the probable clinical impact for *BtB* service users, by assuming no improvement occurs for those who do not complete the post-intervention outcome measures, the method may underestimate both the true extent of the change and variation in outcomes (Streiner & Geddes, 2001).

Despite these limitations, present findings offer grounds for optimism that CCBT – if correctly implemented and carefully managed – is not only of value to service users in primary care, but may also be able to benefit their secondary care counterparts. *BtB* has the potential to provide the first step in secondary treatment care plans, offering an increased chance of accessing a CBT-based intervention, and greater choice to service users currently fated to lengthy NHS waiting lists.

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