

The acceptability to patients of computerized cognitive behaviour therapy for depression: a systematic review

E. Kaltenthaler^{1*}, P. Sutcliffe¹, G. Parry¹, C. Beverley², A. Rees¹ and M. Ferriter³

¹ School of Health and Related Research (ScHARR), University of Sheffield, Sheffield, UK

² Adult Social Care Directorate, Cumbria County Council, Rickergate, Carlisle, UK

³ Department of Research and Development, Nottinghamshire Healthcare NHS Trust, Rampton Hospital, Woodbeck, Notts, UK

Background. Cognitive behaviour therapy (CBT) is widely used to treat depression. However, CBT is not always available to patients because of a shortage of therapists and long waiting times. Computerized CBT (CCBT) is one of several alternatives currently available to treat patients with depression. Evidence of its clinical effectiveness has led to programs being used increasingly within the UK and elsewhere. However, little information is available regarding the acceptability of CCBT to patients.

Method. A systematic review of sources of information on acceptability to patients of CCBT for depression.

Results. Sources of information on acceptability included: recruitment rates, patient drop-outs and patient-completed questionnaires. We identified 16 studies of CCBT for the treatment of depression that provided at least some information on these sources. Limited information was provided on patient take-up rates and recruitment methods. Drop-out rates were comparable to other forms of treatment. Take-up rates, when reported, were much lower. Six of the 16 studies included specific questions on patient acceptability or satisfaction although information was only provided for those who had completed treatment. Several studies have reported positive expectancies and high satisfaction in routine care CCBT services for those completing treatment.

Conclusions. Trials of CCBT should include more detailed information on patient recruitment methods, drop-out rates and reasons for dropping out. It is important that well-designed surveys and qualitative studies are included alongside trials to determine levels and determinants of patient acceptability.

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Introduction

Cognitive behaviour therapy (CBT) is used to treat a variety of mental health disorders, including depression and anxiety. CBT is not always available to patients because of a shortage of therapists and long waiting times. Alternative modes of delivery have been developed, including group therapy, bibliotherapy and computerized CBT (CCBT). CCBT is used to treat depression as well as other mental health disorders. There is now substantial evidence that CCBT is an effective alternative to CBT for the treatment of mild to moderate depression and anxiety

(Kaltenthaler *et al.* 2002, 2004, 2006). Two CCBT software programs were recently recommended by the National Institute of Health and Clinical Excellence (NICE, 2006) for use in the UK National Health Service. These programs are now in use throughout the UK as well as other countries.

Health technology assessment

A recent health technology assessment (HTA) in the UK examined the clinical and cost-effectiveness of CCBT for the treatment of depression and anxiety (Kaltenthaler *et al.* 2006). HTA, by necessity, is a process that is rapid, fit for purpose and informs decision making. The process of HTA provides a systematic review of the evidence on clinical effectiveness of a new technology as well as a cost-effectiveness analysis. Information on patient acceptability, although also important, is often lacking.

* Address for correspondence: Dr E. Kaltenthaler, School of Health and Related Research, University of Sheffield, Regent Court, 30 Regent Street, Sheffield S1 4DA, UK.
(Email: e.kaltenthaler@sheffield.ac.uk)

Patient acceptability

Within the time and financial constraints of a technology appraisal it is difficult to explore the issue of patient acceptability in sufficient depth. However, patient acceptability is a key component to consider when evaluating the implementation of a new technology. A new health-care technology, such as CCBT, may be clinically effective but unacceptable to patients for a variety of reasons. Patients may be unhappy with the length or type of treatment or think that an alternative treatment may be preferable. This will have obvious consequences for the implementation of new technologies. Treatment acceptability is important for ethical, methodological and practical reasons. First, there is an ethical obligation to understand more about which treatments are most acceptable and the reasons why others are unacceptable to patients. Second, if two treatments are compared in a randomized trial where one is markedly less acceptable than the other, both the external and internal validity of the findings is threatened. External validity is reduced where only a proportion of screened patients are willing to enter the trial or receive a treatment. Internal validity is compromised if there is differential drop-out between the two conditions, particularly where patients are lost to follow-up in an intention-to-treat design. Finally, the acceptability of therapy to patients is a prime factor attenuating the clinical effectiveness of services as delivered compared with the efficacy of treatments demonstrated in clinical trials. For example, in the psychological treatment of depression it is commonly found that a substantial proportion (more than a quarter) of the eligible group does not wish to enter therapy or drops out (Keller *et al.* 2000). This attrition rate will reduce the impact of the intervention on the target group.

Acceptability is one of six indicators of service quality outlined by Maxwell (1992) alongside effectiveness, safety, equity, efficiency and accessibility, although, of these, most attention has been paid to clinical effectiveness. Very little has been reported about the acceptability of CCBT compared with traditional approaches, but other evidence suggests different delivery formats do affect CBT acceptability. For example, comparison of the acceptability of group *versus* individual delivery of CBT in primary care for anxiety disorders showed that, when given a free choice of group or individual CBT at the end of the waiting list period, the overwhelming majority (95%) of the waiting list patients chose individual CBT (Sharp *et al.* 2004). Little is known about why some people find computerized treatment unacceptable. A study of factors determining the uptake of a CD-ROM-based CBT self-help treatment for bulimia

(Murray *et al.* 2003) found that those patients who declined the computerized method had a significantly lower expectation of the usefulness of self-help for themselves, although not for others. Their overall attitudes to self-help were similar to those of the group who engaged with the computerized treatment. They were as likely to have used self-help previously and they were as confident in using a computer. However, qualitative exploration revealed a range of concerns and anxieties about computer treatment, some of which were based on misunderstandings about this form of treatment. This study suggests that taking simple steps to identify and correct misperceptions can improve acceptability. The acceptability of CCBT for a variety of other conditions has also been explored. Newman *et al.* (1997a) reported information on acceptability of CCBT for the treatment of anxiety, Ghosh *et al.* (1988) for phobias, Newman *et al.* (1997b) and Kenardy *et al.* (2003) for panic disorder and Zabinski *et al.* (2004) for eating disorders. Griffiths & Christensen (2006) in their review of randomized controlled trials (RCTs) of internet interventions for mental disorders found that seven of the 15 included studies reported information on user satisfaction. The findings indicate consistently positive evaluation by users.

Our aim was to review systematically the sources of information on patient acceptability within a recent technology appraisal of CCBT for patients with depression. We hypothesized that, although clinical outcome data for CCBT have been promising, patient acceptability data have been less so. As many research studies in this field do not measure or report acceptability directly, we used proxy indices. The following were identified as possible sources of information about patient acceptability: CCBT take-up rates; patient drop-out rates and reasons for drop-outs; and questionnaires or surveys (either alone or as part of a trial) that covered patient acceptability or satisfaction. Take-up rates were defined as the percentage of patients who agreed to start treatment relative to the total number approached with the option to have CCBT. Drop-outs were defined as patients who began a course of treatment but left before the treatment was completed.

Method

Searches

Fifteen electronic bibliographic databases (including Medline, PsycINFO, CINAHL and EMBASE) were searched, covering biomedical, health-related, science, social science and grey literature (including current research). In addition, the reference lists of relevant

articles were checked and various health services research-related resources were consulted via the internet. These included HTA organizations, guideline-producing bodies, generic research and trials registers and specialist mental health sites.

Search terms were broad and were a combination of free-text and thesaurus terms. Population terms, such as depression, were combined with intervention terms such as cognitive therapy AND computer, for example. This was supplemented by more specific searches on named packages such as Beating the Blues, Overcoming Depression, Cope, etc. identified in the initial searches. Databases were searched from 1966 to June 2007. Authors of relevant studies identified in the searches were contacted for additional studies. Unpublished studies obtained from authors were included if relevant outcome data were reported.

Types of studies

Studies were included if they fulfilled the following criteria:

Population: adults with mild to moderate depression with or without anxiety as defined by individual studies.

Intervention: CBT (as defined in the studies) delivered alone or as part of a package of care either via a computer interface (personal computer or the internet) or over the telephone with a computer response.

Outcomes: patient recruitment, drop-outs and information on preference, satisfaction or acceptability of treatment.

Type of studies: RCTs, non-randomized comparative trials and non-comparative trials were included.

No studies reporting outcomes on patient acceptability were excluded. All data from included studies were extracted by one reviewer and checked by a second using a standardized data extraction form.

Results

Patient recruitment and drop-outs

We screened 1591 references and assessed the text of 147 full papers. Sixteen trials of CCBT for depression were identified, of which eight were RCTs, seven were non-comparative trials and one was a comparative, but non-randomized trial. Comparators in these studies included therapist-led CBT, treatment as usual, waiting list control, an internet discussion group, variations of a CCBT program and a depression information website. Methods of recruitment and drop-out rates of participants for the 16 trials are reported in Table 1.

Participants in the trials were recruited in different ways: self-selection, for example through responding to advertisements in newspapers or spontaneous visits to a CCBT program website ($n=8$); health-care professional referral, such as by a general practitioner (GP), mental health services or occupational health ($n=6$); or a combination of self-referral and health-care professional referral ($n=2$). Trials also differed in the type of participant recruited (e.g. some were clinically depressed; others were not given a diagnosis of depression).

In one study (Whitfield *et al.* 2006), 80 patients were offered CCBT but only 22 (25%) agreed to take part. Two other studies reported percentages of potential participants who agreed to take part. Clarke *et al.* (2002) reported that, from an initial 13 990 of people approached, only 526 accessed the study website. After adjustments for the number of people with internet access, the authors report an initial engagement rate of 6.0%. Of the 526 interested, 299 (58.6%) agreed to take part in the study. Clark *et al.* (2005) approached 12 051 potential participants, of whom 291 (2.4%) accessed the study website and 255 agreed to participate, 200 of whom were from the depressed group (33% of those invited).

The mean percentage drop-out over the 16 trials was 31.75% (S.D. = 16.52), the range was 0–75% of participants. The reasons for drop-out were reported in only six trials, the most common reason being participants were too busy or had changes in circumstance, with only two trials reporting that treatment was not useful. A factor that appeared to influence the numbers who dropped out was the duration of treatment, which varied considerably across trials (range 1–33 sessions). It is difficult to make comparisons between packages regarding drop-out rates because of differences in study design, populations and methods for defining drop-outs and level of detail provided in the study.

Patient preferences, satisfaction and acceptability of treatment

Twelve trials reported information on acceptability and satisfaction associated with CCBT. These trials are shown in Table 2. There was considerable variability in the acceptability and satisfaction of CCBT treatment across trials. Most studies provided information on preference, satisfaction and acceptability only for patients who completed the course of CCBT. No information was provided in any of the studies on the large percentage of participants who had dropped out. The majority of participants responding to questions about CCBT across these 12 trials appeared to rate CCBT treatment positively.

Discussion

Sources of information on patient acceptability

With increasing interest in CCBT as an alternative or supplement to therapist-led CBT, it is important to consider just how acceptable CCBT is to patients. This paper systematically reviews information on patient acceptability from take-up rates, patient drop-out rates and surveys on patients' attitudes towards CCBT. Many of the studies only reported information for study completers, giving a distorted view of patients' perceptions of treatment.

Recruitment

In real-life situations, patients who meet criteria for depression may be offered CCBT by their health-care provider. In many of the studies reported in this paper, participants were self-selected, or specifically selected by their health-care practitioners to have CCBT, making it difficult to draw conclusions on how amenable patients will be to CCBT. We identified three studies that looked at take-up rates among patients offered CCBT, ranging from 3.3% to 25%. However, refusal to participate in a trial of CCBT may indicate reluctance to enter a trial, rather than an aversion to CCBT. Qualitative studies could be undertaken to determine why participants deemed to be suitable for CCBT chose not to begin treatment.

Drop-out rates

Reported drop-out rates for CCBT ranged from 0% to 75% in the studies, with a mean percentage drop-out rate of 31.75% (s.d. = 16.52). This is comparable to drop-out rates for other psychological therapies. Bower & Rowland (2006) in a review of trials of counselling in primary care found drop-out rates ranging from 9% to 46% at 6 weeks or more. Reported drop-out rates for face-to-face CBT range from 5% to 38% (Watkins & Williams, 1998). Barbui *et al.* (2004) report drop-out rates of 27% for serotonin reuptake inhibitors and 30% for tricyclic antidepressants.

It is also important to consider that drop-outs from internet CCBT sites may be expected to be higher than from CCBT delivered in other ways. Attrition rates from open-access non-tracked websites have found as few as 1% of users completing a full course of online therapy (Eysenbach, 2005). Christensen *et al.* (2004b) found, in a study comparing public users of the internet program MoodGYM with trial participants, that 15.6% of public users and 66% of trial participants completed two or more modules. The authors suggest that the formal structure of a trial may be important for compliance. Christensen *et al.* (2006b) further found that 16% of the original MoodGYM users

completed two or more depression assessments compared with 18% of users of the public version of the site (MoodGYM Mark II). Completion of more site material was associated with better psychological outcomes. These issues are important to consider and further work may be needed to determine reasons why users of internet CCBT sites drop out of treatment before completion.

Surveys on acceptability

The questionnaires or surveys we identified gave information on acceptability of treatment only for those patients who had completed treatment, with no information provided for those who had dropped out of treatment. Ten studies provided questionnaire or survey information with most respondents rating CCBT favourably, although, as illustrated in Table 2, information was sketchy. A range of factors including delivery mode, motivation, continuation benefits and discontinuation benefits will affect the acceptability of CCBT to patients (Cavanagh *et al.* 2003) and in-depth questionnaires or qualitative studies to determine what patients perceive as positive and negative may prove useful.

A further consideration when planning the provision of CCBT programs is the acceptability of this technology to health-care providers. In a study in the UK (Whitfield & Williams, 2004), 500 therapists were surveyed, of whom 329 (65.8%) responded. Only 12 (2.4%) were offering any form of computerized self-help. However, more than 90% said they would consider using it in the future. Many practitioners felt that CCBT was not as effective as seeing a practitioner face to face and it may be that some patients believe the same.

Limitations of the review

There are several limitations to the review. There is considerable variability between the studies regarding design, population, method of recruitment and incorporation of CBT components within the software programs used, making it difficult to make comparisons between studies. The range of depression severity and level of co-morbidities also varied considerably between studies. Limited information was available for patients who had discontinued with the CCBT programs. Information on satisfaction was only provided for treatment completers. In addition, recruitment of patients into these studies did not usually represent routine clinical settings. Only three studies reported true take-up rates, making it difficult to draw comparisons with routine clinical situations.

The attrition rates in the study may not be an accurate reflection of attrition rates in 'real-life'

Table 1. Patient recruitment and drop-outs

First author; Setting	CCBT program: description of package	Study type	Total study patients, <i>n</i>	Recruitment	Total drop-out, <i>n</i> (%)	Reason for drop-out in CCBT group, <i>n</i>
Andersson (2005); Home internet treatment, Sweden	No name. Eighty-nine pages of text divided into five modules provided on a website, quizzes, email feedback and web-based discussion group	RCT	117	Advertisement in newspapers	21 (37%) in CCBT group and 11 (18%) in control group	Figures not reported; however, treatment was perceived as too demanding
Cavanagh (2006); Primary care and clinical psychology service, UK	Beating the Blues: eight interactive CBT sessions	Non-comparative	219	Identification by health-care professional	84 (38%) did not complete all eight sessions	Not reported
Christensen (2004 <i>a</i>); Home internet treatment, Australia	MoodGYM: a web-based CBT program for depression consisting of five interactive modules	RCT	525	Mail-shot questionnaire to random selection of 27 000 people on the electoral register	90 (17%)	No reason (12); not contactable (10); too busy (7); family reasons (3); didn't like it (6); internet trouble (5); other (3). An additional 15 did not complete treatment; reasons were not reported (33.7% drop-out rate in CCBT group). CCBT had higher drop-out rates than information website
Christensen (2006 <i>a</i>); Home internet treatment, Australia, UK, USA, Canada, New Zealand	Six variations of MoodGYM (see above) each providing different combinations of the five modules	RCT	2794	Website visitors	1662 (75%) post-treatment (range 72–78% for six groups)	Not reported
Clarke (2002); Internet-based treatment, USA	Overcoming Depression on the Internet (ODIN): internet-based intervention focusing on cognitive restructuring techniques adapted from CBT manuals. Eight sections covering information on depression, through processes and practical exercises	RCT	299	Study brochures were sent to 6994 HMO members with a diagnosis of depression and 6996 members as a matched sample with no diagnosis of depression	103 (34%) at 16 weeks	Not reported

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Table 1 (cont.)

First author; Setting	CCBT program: description of package	Study type	Total study patients, <i>n</i>	Recruitment	Total drop-out, <i>n</i> (%)	Reason for drop-out in CCBT group, <i>n</i>
Clarke (2005); Internet-based treatment, the USA	ODIN (as above)	RCT	255	Recruitment from 6030 HMO members receiving treatment for depression and 6021 members who did not receive depression-related services	86 (34%) at 16 weeks	Not reported
Grime (2004); Occupational health, UK	Beating the Blues (as above)	RCT	48	36 through occupational health consultations and 12 volunteers	8 (33%) did not complete eight sessions	Partially reported and included inability to commit time and no desire to continue
Marks (2003); Self-help clinic, UK	Cope: 3-month interactive voice response plus workbook-based system	Non-comparative	210 (some patients had anxiety)	Self-referral; advertised in local GP surgeries, community mental health centres, psychiatric out-patient clinics, local papers, Yellow pages, voluntary organizations and NHS Direct	60 (29%) dropped out early or gave no post-treatment data	39/60 gave reasons: hard to attend (13); therapy unhelpful (10); want face-to-face help (8); low motivation (8); got help elsewhere (2); problem improved (2); no reasons reported for other drop-outs
Osgood-Hynes (1998); Computer-aided telephone system, USA/UK	Cope (as above)	Non-comparative	41	Referrals from mental health and primary-care professionals and newspaper advertisements	13 (32%) at 12 weeks	Not reported
Proudfoot (2004); Primary care, UK	Beating the Blues (as above)	RCT	274	Referral by GP or screening with GHQ	71 (26%) at 6-month follow-up	Actual number of drop-outs not reported. Reasons for non-attending were: unknown (approx. 40%); change in circumstances (15%); physical ill-health (15%); moving out of the catchment area (10%); no longer have depression/anxiety (10%); unhappy with treatment (10%)

Proudfoot (2003); Hospital, UK	Beating the Blues (as above)	Non-comparative	20	Newspaper article	9 (45%) did not complete eight sessions	Reasons for non-attending reported for seven only: obtained jobs (2), journey too long (3), did not have time (1), thought program inappropriate for his needs (1)
Robertson (2006); Home internet, Australia	RecoveryRoad: adjunct to usual treatment, 12 sessions over 12 months with adherence reminders	Non-comparative	144	Clinician referral	32 (22%) dropped out before starting program	Not reported
Selmi (1990); Not reported, USA	No name. CBT over six sessions	RCT	36	Newspaper article	0	No drop-outs
Van den Berg (2004); Community mental health resource centre, UK	Beating the Blues (as above)	Non-comparative	115	Referral by GP	52 (45%)	Not reported
Whitfield (2006); Clinical psychology service, UK	Overcoming Depression: a Five Areas Approach: CD-ROM with CBT components over six sessions	Non-comparative	20	Consecutive referrals to clinical psychology service	Six (30%) by week 3	Not reported
F. Yates (unpublished results); GP practices and research office, UK	BALANCE: CD-ROM of a single session consisting of 15 options, nine of which were 'knowing' or 'doing' options related to home exercises and practical assignments related to favoured coping strategies; option to return for more sessions	Comparative	45	Referral by GP	Five (11%) lost to follow-up	Not traced (1); changed mind about computer use (1)

CCBT, Computerized cognitive behaviour therapy; GP, general practitioner; RCT, randomized controlled trial; GHQ, General Health Questionnaire; HMO, Health Maintenance Organization. Drop-outs were calculated by subtracting the number of participants commencing treatment from the number of participants who completed treatment.

Table 2. Patient preferences, satisfaction and acceptability of treatment

First author	Patient preference, satisfaction and acceptability of treatment
Andersson (2005)	Treatment was deemed too demanding by participants
K. Cavanagh (unpublished observations)	Of 219 participants, 84 (38.4%) completed the Patient Feedback Questionnaire for CCBT. After program completion, 92% of patients reported they were happy to use program, 84% reported it was easy to use and 77% would recommend it to others. 2% of patients were unhappy with program, 3% found it difficult to use and 8% thought it would not have long-lasting effects. No information provided for 61 (45%) who completed eight sessions
Christensen (2004a)	MoodGYM and psychoeducational site appeared to be acceptable to participants, as shown by the low drop-out rates
Grime (2004)	CCBT was considered acceptable to most participants; however, one-third of those randomized to CCBT did not complete all eight sessions of the program; there was low participation in this study, with CCBT being much less popular than counselling
Marks (2003)	70 patients gave information on four questions on satisfaction (rating 0–8: 0 = very good and 8 = very poor): Technical aspects of system: good to moderate (mean = 3.1 ± 1.5); Content and structure: good to moderate (mean = 2.7 ± 1.4); Live support from clinician: very good to good (mean 1.6 ± 1.5); Clinic as a whole: good (mean = 2 ± 1.5)
Osgood-Hynes (1998)	Patient satisfaction scale was filled out by 28 completers. Patients felt comfortable with system, easy to use and booklets were helpful. 21 completers thought treatment (Cope) improved their quality of life
Proudfoot (2004)	Treatment satisfaction was significantly higher among Beating the Blues patients compared to treatment-as-usual patients. Exact values were not provided
Proudfoot (2003)	91% of the patients completing the program liked the multi-media features, 82% found CCBT compared as well, if not better, to other forms of treatment they had had for depression/anxiety
Robertson (2006)	Majority of patients were satisfied with the system
Selmi (1990)	Responses to questions on exposure to techniques for defining and solving everyday problems, perceived therapist understanding, and methods for dealing with people were all more positive in the group receiving therapist CBT than in the group receiving CCBT
Whitfield (2006)	At 6 weeks, 60% rated treatment useful as 'a lot' and 40% 'a little'. 33% rated overall experience of using the program 'very good' and 67% rated it 'good'. 15 respondents said they would recommend the program to others. At end of treatment 80% said they would prefer a CD-ROM over book treatment
F. Yates (unpublished results)	25 of 29 responders said the program made them think in a new way about their problem. After the first session 60% would have preferred to do the program alone rather than with a therapist. Three people found the program too slow

CCBT, Computerized cognitive behaviour therapy.

situations. Patients may be influenced by other factors, such as their relationship with their health-care provider, in reporting positive or negative experiences with CCBT. The information reported here is not necessarily generalizable to other conditions.

Future research

Research into the experiences of CCBT users is required to confirm whether a broader dissemination of CCBT services within health-care systems is appropriate. Key points of the patient care pathway, which could be studied through both survey and intensive qualitative methods, include the process of initial engagement, continuation *versus* drop-out, and

in those completing, satisfaction or regret of undertaking CCBT. Further prospective investigation into factors predicting uptake, outcome and continuation of treatment is needed. Studies of CCBT should record the number of patients initially screened, those who enter the study and those who complete treatment.

Conclusions

Several studies have reported positive expectancies and high satisfaction in routine care CCBT services, for those completing treatment. The limited evidence evaluated suggests that CCBT can be an effective and acceptable treatment for a proportion of people

presenting with mild to moderate depression and be part of the range of self-help options offered to patients. However, the magnitude of benefit and acceptability is not clear.

There is limited information on CCBT and patient acceptability for the treatment of depression. Studies of CCBT should include more detailed information on patient recruitment methods. Drop-out rates and reasons for dropping out need to be clearly reported. It is important that well-designed surveys and qualitative studies are included alongside trials to determine levels of patient acceptability.

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Declaration of Interest

None.

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