# Self-treatment of obsessive-compulsive disorder guided by manual and computer-conducted telephone interview

Akiko Nakagawa*, Isaac M Marks*, Je-Min Park*, Martin Bachofen*, Lee Baer†, Susan L Dottl‡ and John H Greist‡

*Institute of Psychiatry, London, UK; †Massachusetts General Hospital, Boston, Massachusetts; ‡Healthcare Technology Systems, Madison, Wisconsin, USA

**Summary**

While on a waiting list for treatment by therapist-guided exposure and ritual prevention (ERP), patients with obsessive-compulsive disorder (OCD) did self-treatment at home guided by a manual plus a computer-driven telephone interview system (BT STEPS). Of 21 patients who used the system for at least three weeks while on the waiting list, one improved so much that subsequent therapist-guided ERP was unnecessary. Progress of the rest with the system predicted later progress with therapist-guided ERP. Improvement after using the system was similar to that of 20 matched historical controls who had had therapist-guided ERP without the prior use of BT STEPS. Outpatient users of BT STEPS needed less subsequent clinician-guided time than did their matched controls. In this pilot study, patients with OCD improved nearly as much with home self-treatment guided by a manual plus computer, as with treatment guided by a behaviour therapist.

## Introduction

The shortage of behaviour therapists to guide effective exposure and ritual prevention (ERP) therapy for obsessive-compulsive disorder (OCD) has led to a search for other ways of guiding ERP. One way is by a manual plus a computer-driven telephone interview system using interactive voice response (IVR). Forty OCD patients from the USA and the UK improved when guided solely by such a home self-treatment system called BT (behaviour therapy) STEPS[1,2]. A similar outcome was obtained in a replication study of BT STEPS in 21 more OCD patients in the UK[3]. In these two open studies, 84% of patients completed self-assessment. Almost half of all patients went on to do ERP guided by the system and improved significantly; patients who completed self-assessment but did not do ERP did not improve. In both studies gains were significant in intent-to-treat analyses and were similar to those achieved with a prescription of a serotonin re-uptake inhibitor[2]. In a large, eight-site randomized controlled study of 200 outpatients, improvement with BT STEPS was almost as great as with ERP guided by a therapist, and better than with relaxation[4].

The present paper reports the extension of the replication study[3] by examining how OCD patients who had used the BT STEPS system fared with subsequent therapist-guided ERP and how their outcome compared with that of matched historical control patients who had therapist-guided ERP without the prior use of the system.

## Methods

The BT STEPS system has a four-step self-assessment module[1] followed by a five-step self-treatment module using ERP[2]. Patients were given the 190-page system manual and a personal identification number to access the IVR system. They chose their own password to protect the confidentiality of their calls. A toll-free call could be made from any touch-tone telephone in the UK to a computer in Madison, Wisconsin, USA.

Accepted 2 August 1999
Correspondence: Professor I Marks, Institute of Psychiatry, De Crespigny Park, London SE5 8AF, UK (*Fax: +44 171 740 5244; Email: I.Marks@iop.bpmf.ac.uk*)

The coordinator spent about five minutes with each patient explaining how to use the system and how to make IVR calls, and encouraging them to use it daily. For eight patients who lived far away, the coordinator posted them the manual and explained by telephone how to use the system. Patients read the manual, which asked them at intervals to call the IVR system and to answer questions by pressing appropriate keys on their telephone keypad. Calls for several of the steps could be repeated as often as patients wished.

The coordinator answered patients' technical questions about the IVR system (e.g. how to put it on temporary hold) and general questions about behaviour therapy. Patients were left to personalize their self-treatment programme under the guidance of the manual and the IVR system.

When a patient completed an IVR call the computer generated and faxed a feedback sheet to the coordinator that summarized the call (e.g. the goal chosen and the patient's discomfort rating for that goal). The coordinator wrote on the sheet brief praise for progress achieved (or supportive comments if there had been no progress), answered questions that might have arisen during previous telephone contact (e.g. by suggesting that patients read or re-read relevant steps in the manual), signed the sheet and posted it to the patient. After patients started doing ERP sessions, a personalized ERP homework diary sheet, based on the goals they had entered into the IVR system, was posted to them each week. Patients who did not call the IVR system for a week were contacted by telephone or post to find out why and to encourage them to continue using BT STEPS.

## Design

Twenty-three OCD patients referred for behaviour therapy and screened by a clinician were placed on a waiting list for behaviour therapy, either as outpatients or in a hostel ward where patients reside for some weeks with staff present eight hours a day. The waiting-list patients were given a chance to assess and treat themselves guided by BT STEPS until their turn came for clinician-guided ERP. The study was approved by the Ethics Committee (Research) of the Bethlem–Maudsley Hospital and the Institute of Psychiatry. Patients gave written informed consent.

The outcome after BT STEPS was compared with that after subsequent clinician-guided ERP and with the outcome of matched historical control OCD patients who had had therapist-guided ERP before BT STEPS was available. Of the 20 matched control patients, six had had outpatient ERP and 14 had had ERP in a hostel; they were a random sample of all past unit patients whose case-notes and outcome data were available and who matched the study patients who had completed therapist-guided care after BT STEPS ($n$=10, three as outpatients, seven in a hostel). Matching was for age, gender, problem duration and baseline work/social adjustment.

## Measures

BT STEPS patients rated themselves before and after using the system and after subsequent therapist-guided care. Ratings were with the IVR system and with paper-and-pencil forms; only paper-and-pencil ratings are reported, in order to compare them with the paper-and-pencil data available from the historical control patients. Patients rated themselves before and after BT STEPS on the Yale–Brown Obsessive Compulsive Scale[5] (YBOCS, score range 0–40), the Bech six-item version[6] of the Hamilton Depression Rating Scale (HAMD; score range 0–24) and the four-item Work and Social Adjustment scale[7] (score range 0–32). Understanding of ERP was assessed before and after using the system with a new six-item questionnaire. The matched historical control patients had rated the Work and Social Adjustment scale before and after treatment. The clinician time needed and days to discharge from treatment were available for all patients.

## Analyses

Paired and independent $t$-tests and repeated-measures analyses of variance were used to compare improvement between groups of patients and across occasions.

# Results

Twenty-three patients entered the study, but two had to withdraw before they could use BT STEPS for at least three weeks because their turn came up unexpectedly early on the waiting list to start clinician-guided ERP. This left 21 patients who had a chance to use BT STEPS for at least three weeks while on the waiting list. After using BT STEPS, one of these 21 patients (an outpatient) asked to be taken off the waiting list as she had improved so much that she no longer needed clinician-guided care. Of the remaining 20 patients, 10 completed clinician-guided care and ratings, one completed such treatment but had too much missing data to be included in the analysis, one was still in treatment when the study ended and eight dropped out prematurely.

At baseline, the BT STEPS and matched historical control patients had similar age, gender, OCD

duration, and Work and Social Adjustment scores (Table 1). The matched controls had not rated the YBOCS and HAMD.

## Comparison with post-BT STEPS clinician-guided care

### *Self-assessment*

Eighteen patients completed the self-assessment module of BT STEPS. The five patients (24% of 21) who failed to complete self-assessment also failed to complete subsequent clinician-guided care, because of low motivation, according to the clinicians. Two of the five patients did not begin clinician-guided care, two dropped out early in treatment and one dropped out before completing it.

### *Self-therapy*

Ten patients (48% of 21) completed two or more ERP sessions guided by BT STEPS. All of these patients later completed clinician-guided care (although for one no post-BT STEPS data were available, and so this subject was omitted from further analyses). In contrast, only three of the remaining eight patients who did only one ERP with BT STEPS session or no session completed later clinician-guided care (two-tailed Fisher's exact test, $P < 0.05$).

### *Time in care*

Patients used BT STEPS for a mean of 67 days. They spent a mean of 106 days in subsequent clinician-guided care, either as an outpatient or in a hostel. Compared with the eight non-completers of clinician-guided care, their 10 completer counterparts had finished BT STEPS assessment in less time (16 days) and spent slightly more time on ERP with BT STEPS (68 days). The patient who said she no longer needed therapist-guided care after using BT STEPS (her YBOCS score dropped from 20 to 9) spent 45 days using the system—only seven days to complete self-assessment and 38 days to do ERP.

Patients had fewer contacts and far less time with the study coordinator (a psychiatrist) while using BT STEPS than they had with a therapist in clinician-guided care (respective means of 11 vs 24 contacts and 99 vs 1118 min). With BT STEPS, contacts were typically by telephone and concerned technical (non-clinical) issues, while contacts during clinician-guided care involved both face-to-face and telephone interactions and focused on clinical issues.

### *Outcomes*

Ten patients who used BT STEPS completed subsequent clinician-guided care. Of these, seven had done at least two ERP sessions with BT STEPS and two had done only one such session or none; post-BT STEPS data were unavailable for one patient.

The YBOCS scores of patients who had done two or more ERP sessions had improved after completing BT STEPS and fell only marginally more after subsequent therapist-guided care (Fig 1). In contrast, the YBOCS scores of the two patients who had done only one or no ERP session with BT STEPS did not improve with BT STEPS but improved with subsequent clinician-guided care; HAMD and Work and Social Adjustment scores followed a similar pattern.

Patients' understanding of ERP improved at least as much after BT STEPS as after clinician-guided care. Mean understanding scores rose from 8.7 before undertaking BT STEPS ($n$=23) to 11.1 after ($n$=21) to 13.1 after clinician-guided care ($n$=9). Scores solely for the nine patients who gave data after clinician-guided care rose similarly, from 9.6 to 12.4 to 13.1, respectively.

### *Satisfaction*

When they completed clinician-guided care, the nine patients who had done prior ERP with BT STEPS rated their satisfaction with each form of treatment. They had not been asked to rate satisfaction with BT STEPS at the time they switched to clinician-guided care, so ratings of BT STEPS versus clinician-guided care are not comparable due to memory and recency effects. The

**Table 1** Characteristics of BT STEPS patients and historical control patients

| Characteristic | BT STEPS patients ($n$=21) | Matched controls ($n$=20) |
|---|---|---|
| Mean age (years) | 28.6 | 27.9 |
| Gender (% women) | 51% | 45% |
| Mean OCD duration (years) (SD) | 12.0 (6.9) | 9.6 (5.5) |
| Baseline Work and Social Adjustment total score* | 21 (7.2) | 22 (6.1) |
| Time of clinician treatment | After BT STEPS was used | Before BT STEPS was available |

*Scores other than this were unavailable for matched historical control patients.

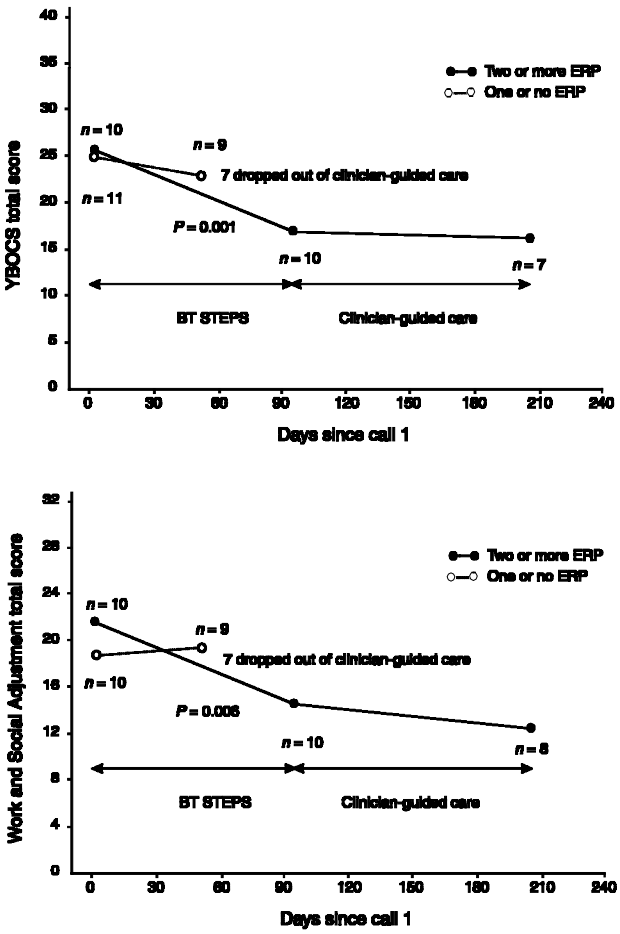


**Fig 1** Improvement with BT STEPS and with subsequent clinician-guided care, shown separately for patients who completed two or more ERP sessions ($n$=10) and those who did only one or no ERP session ($n$=10–11).

nine patients were far more satisfied with clinician-guided care than with BT STEPS (mean score 3.8, SD 1.5, vs 7.0, SD 0.9; $t$=5.9, $P$< 0.0001). When asked about each type of care, patients felt that BT STEPS had helped them to understand ERP and to work on it at any time and at their own pace, whereas the clinician encouraged them more, especially when they felt overwhelmed by a fear of doing ERP, helped them tailor goals better, and handled their relatives' problems better. One patient thought it would be helpful to use BT STEPS concurrently with clinician-guided care.

## BT STEPS patients versus historical control patients

### *Outcome on the Work and Social Adjustment scale*

The patients who used BT STEPS and the matched historical control patients had a similar mean baseline score for Work and Social Adjustment (BT STEPS 21, SD 7.2, vs controls 22, SD 6.1). Their respective end-of-treatment means were 17, SD 8.1, for BT STEPS, and 15, SD 8.1, for the matched controls, improvement being significant in both groups ($F_{1,39}$=22.1, $P$=0.0001) and to a similar degree ($F_{1,39}$=1.9, $P$=0.18) on repeated-measures analysis of variance.

### *Time in treatment*

As outpatients had less severe conditions and required less therapist time than hostel patients, they had to be examined separately over time despite their small numbers. Compared with historical control outpatients, the BT STEPS outpatients completed clinician-guided care with fewer contacts with the therapist (8 vs 22) and less total therapist time (597 vs 867 min) but not fewer days to discharge (Table 2). In contrast, on these three variables the BT STEPS hostel patients resembled historical control hostel patients.

# Discussion

Patients who used BT STEPS and then had clinician-guided ERP improved significantly in their OCD. They improved as much doing BT STEPS-guided ERP as matched historical controls who had only therapist-guided ERP. Gains in understanding ERP were similar after BT STEPS and after subsequent clinician-guided care. The few outpatients who had used BT STEPS had

**Table 2** Comparison of mean (SD) resources used by controls and BT STEPS patients

| | Outpatients | | Hostel patients | |
|---|---|---|---|---|
| | BT STEPS ($n$=3) | Control ($n$=6) | BT STEPS ($n$=7) | Control ($n$=14) |
| Total therapist time (min) | 597 (107) | 867 (614) | 1333 (474) | 1341 (272) |
| Number of contacts | 8 (1.5) | 22 (17.7) | 35 (13) | 30 (6.9) |
| Duration of treatment to discharge (days) | 129 (4.4) | 143 (80.4) | 96 (76) | 83 (21) |

two-thirds of the therapist contacts and a third of the total therapist time in subsequent clinician-guided care than did matched controls. This advantage was not seen in hostel patients who had used BT STEPS, perhaps reflecting their more structured treatment and greater baseline severity than outpatients (on the YBOCS, HAMD, and Work and Social Adjustment scale). The greater overall satisfaction with therapist-guided care is not easy to interpret because of the long interval before satisfaction with BT STEPS was rated (at the point that clinician-guided care was completed).

Clinician-guided care in the present study was from behaviour therapists trained to do ERP for OCD. Most clinicians, in contrast, do not receive such training but could use a system such as BT STEPS to help them treat OCD patients. The patients who had clinician-guided ERP in a hostel emphasized the value of contact not just with their therapist but also with fellow OCD sufferers who were doing similar self-treatment. User groups could be set up for mutual support.

Every patient who failed to complete assessment with BT STEPS also failed to complete subsequent clinician-guided care, and most of the patients who failed to do BT STEPS failed to complete therapist-guided ERP too. Low motivation at baseline was associated with less improvement with BT STEPS and failure to complete clinician-guided ERP[3]. Motivation leading to treatment compliance is a key to success in the treatment of many conditions, including non-psychiatric ones. The high drop-out rate from post-BT STEPS therapist-guided care (8 of 21 who entered the present study) perhaps reflects the fact that patients may respond less to a treatment that follows another one[8]. A further study to control for order effects is therefore required.

IVR systems incur development and maintenance costs. The BT STEPS manual is being tested alone in a format modified to allow its use without the IVR system. Drawbacks to the use of a manual alone (without IVR), however, include its inability to give interactive feedback to patients, reduced accessibility by clinicians to data about patients' progress, and perhaps more demands on clinicians from patients who are not able to access the IVR system round the clock.

The present pilot study was small and uncontrolled, but its results accord with those of a previous controlled study[4]. It suggests potential uses for computer-aided self-help systems in psychiatric services. For a few sufferers such systems might remove the need to see a clinician after initial screening (as in one of the present 21 patients). IVR systems allow self-help at home to reduce the stigma of psychiatric attendance and the bother of having to make repeated appointments and clinic visits during office hours. Such systems may shorten waiting lists and expedite earlier treatment, so reducing the burden on patients and families. Computer-aided systems can prepare patients for clinician-guided care and may shorten the time that some patients need with therapists. Clinicians can treat more patients per day because the computer takes over certain repetitive aspects of care and frees them to handle especially difficult problems. BT STEPS-type systems may allow more OCD sufferers to access expert help more quickly and at lower cost, without having to wait for more specialists to be trained. Finally, clinicians could acquire some therapy expertise by role playing the use of such systems as a mock patient.

*Acknowledgements:* BT STEPS was developed with a grant from Pfizer, Inc., New York, to the Dean Foundation, Middleton, WI. Partial support was given to Dr Nakagawa by the Japanese Ministry of Education and the Daiwa Anglo-Japanese Foundation, to Dr Park by Pusan National University, and to Dr Bachofen by the Swiss National Science Foundation. The authors are grateful for the contributions of Terese Bailey and William C Marten. The intellectual property rights to BT STEPS are owned by Drs Baer, Greist and Marks.

## References

1 Marks IM, Baer L, Greist JH, *et al*. Home self-assessment and self-treatment of obsessive compulsive disorder using a manual and a computer-conducted telephone interview: two UK–US studies. *British Journal of Psychiatry* 1998;**172**:406–12
2 Greist JH, Marks IM, Baer L, *et al*. Home self-exposure therapy of OCD using a manual and a computer-conducted telephone interview: a US–UK study. *MD Computing* 1998;**15**:149–57
3 Bachofen M, Nakagawa A, Marks IM, *et al*. Home self-assessment and self-treatment of obsessive compulsive disorder using a manual and a computer-conducted telephone interview: replication of a UK–US study. *Journal of Clinical Psychiatry*, August 1999:545–9
4 Greist JH, Marks IM, Baer L, *et al*. Computer-assisted behavior therapy for OCD: a multi-center randomized controlled trial. Paper to the Annual Meeting of American Psychiatric Association, Washington, DC, 20 May 1999
5 Goodman WP, Price LH, Rasmussen SA, *et al*. The Yale–Brown Obsessive Compulsive Scale. I: Development, use and reliability. II: Validity. *Archives of General Psychiatry* 1989;**46**:1006–11, 1012–16
6 Bech P, Alerup P, Gram LF, *et al*. The Hamilton Depression Scale: evaluation of objectivity using logistic models. *Acta Psychiatrica Scandinavica* 1981;**63**:290–9
7 Marks IM. *Behavioural Psychotherapy*. Bristol: John Wright, 1986:46. Now published by I Marks, Institute of Psychiatry, London SE5 8AF
8 Marks IM, Lelliott P, Basoglu M, *et al*. Clomipramine, self-exposure and therapist-aided exposure for obsessive-compulsive rituals. *British Journal of Psychiatry* 1988;**152**:522–34