Home Self-Assessment and Self-Treatment of Obsessive-Compulsive Disorder Using a Manual and a Computer-Conducted Telephone Interview: Replication of a U.K.-U.S. Study

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Background: This open study replicates and extends previous pilot work with BT STEPS, a self-therapy system to assess and treat obsessive-compulsive disorder (OCD) through exposure and ritual prevention.

Method: 21 OCD patients entered this open trial, using a self-guiding manual and any Touch-Tone telephone to access computer-driven interviews via an Interactive Voice Response system. The patients also used the system to rate progress on rating scales.

Results: The results support those of the previous open study. Of the 21 patients, 16 (76%) completed self-assessment over a mean of 21 days. Of these, 10 patients (48%) went on to do 2 or more exposure and ritual prevention sessions over a mean of 64 days; they improved significantly on OCD symptoms, as much as is usual with serotonin reuptake inhibitor medication, and in mood and work/social adjustment. Improvement was predicted by baseline motivation and by rapid completion of self-assessment with BT STEPS, even though self-assessment alone was not therapeutic.

Conclusion: The significant improvement in the intent-to-treat analysis was due to the subgroup of patients (48% of those who began BT STEPS) who went beyond self-assessment to do exposure and ritual prevention self-therapy at home guided by BT STEPS. A controlled trial is now needed.

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Computers have been used to assess patients, screen for psychiatric disorders, and deliver treatment.[1–4] Most applications use desktop and hand-held computers. Recent work has made it possible for patients to use a Touch-Tone telephone to access a computer-driven interview based on Interactive Voice Response (IVR) technology. Callers respond to prerecorded natural-voice questions or statements by pressing number and symbol (*, #) keys on the telephone keypad or by speaking particular words (e.g., numbers, "yes" or "no"). IVR systems to assess, educate, and treat certain patients bring benefits such as ease of accessibility, around-the-clock availability, instant scoring and potential feedback (e.g., by phone or fax), tracking of change over time, and reduction in time required from the clinician.

Clinicians and IVR experts in Boston, Mass.; London, England; and Madison, Wis., developed an advanced IVR self-assessment and self-treatment system and associated manual for patients with obsessive-compulsive disorder (OCD). The IVR system, called BT STEPS (BT = behavior therapy), was controlled by PDID, a Parameter Driven Interview Driver (version 2), with over 70 discrete functional capabilities. BT STEPS has a 4-step self-assessment module followed by a 5-step self-treatment module (detailed by Marks et al.[5] and Greist et al.[6]) using exposure and ritual prevention, an effective form of behavior therapy for OCD.

In a previous study of BT STEPS in 40 patients with OCD in the United States and the United Kingdom, 35 (87.5%) completed the self-assessment module.[5] The 42.5% who went on to do self-therapy improved as much as OCD patients typically do in trials of serotonin reuptake inhibitors.[6]

This article reports a second study that extended the first by testing the progress of 21 patients on the self-treatment module after they completed the self-assessment module. This naturalistic study concerned the potential of BT STEPS in a clinical setting. It differed from the first pilot in that all 21 patients lived in the United Kingdom and were on a waiting list for clinician-guided exposure and ritual prevention (ERP), OCD was diagnosed on ICD-10 rather than DSM-III-R criteria (both are very similar), and the clinician who was the study coordinator gave brief praise for progress, either handwritten on the feedback sheets patients got from the IVR system or given in brief telephone calls.

METHOD

Study patients had been screened for OCD by a clinician and placed on a waiting list for clinician-guided ERP, during which time 32 patients were offered a chance to do self-administered ERP guided by BT STEPS; of these, 23 gave written consent (the study had been approved by the Ethics Committee of the Bethlem-Maudsley Hospital and Institute of Psychiatry, London, U.K.) Of the 23 consenting patients, 2 had to leave the study early in the first 3 weeks because their turn on the waiting list arrived to begin clinician-guided therapy; this did not reflect dissatisfaction with BT STEPS. Data are presented on the remaining 21 patients.

BT STEPS

BT STEPS's self-treatment plan for ERP is detailed elsewhere.[5,6] Patients were given the 190-page BT STEPS 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 United Kingdom to a computer in Madison, Wis.

The coordinator spent about 5 minutes with each patient, explaining how to use BT STEPS and make IVR calls and encouraging daily use of the system. For 8 patients who lived far away from the study site, the coordinator mailed the manuals and explained to them on the phone how to use BT STEPS. Patients read the BT STEPS manual, which asked them to call the IVR system at intervals 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 behavior therapy. Patients were left to personalize their self-treatment program under guidance of the manual and the IVR system. When a patient completed an IVR call, the computer generated and faxed a feedback sheet 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 any questions that may have arisen during a previous telephone contact (typically by suggesting that patients read or reread relevant steps in the manual), signed the sheet, and mailed 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 mailed to them each week. Patients who did not call the IVR system for a week were contacted by phone or mail to find out why and to encourage them to continue using BT STEPS.

Measures

Patients rated themselves at baseline and at the end of BT STEPS on the 10-item Yale-Brown Obsessive Compulsive Scale (Y-BOCS; score range, 0–40),[7] the Bech 6-item version of the Hamilton Rating Scale for Depression (HAM-D; score range, 0–24),[8] and the 4-item Work and Social Adjustment Scale[9] concerning work, home management, social leisure, and private leisure activities (score range, 0–32). At the end of BT STEPS, the 1-item Patient Global Improvement scale[10] was given (score range, 1–7: 1 = very much improved, 4 = unchanged, 7 = very much worse). These 4 scales were given by the IVR system as patients worked through it. Patients also rated themselves on 3 paper-based scales: (1) Understanding of ERP Therapy, a new 6-item questionnaire, was completed at the start and end of BT STEPS; when patients subsequently began clinician-guided treatment, their therapist also rated their understanding of ERP on a 1-item 0–8 scale. (2) Motivation to Do BT STEPS, a 1-item 0–8 scale, at baseline. (3) Expectation of Improvement with BT STEPS, a 1-item 0–8 scale, at the start of BT STEPS and every 2 weeks after Step 5 was completed. Higher scores on the paper-based scales denote more understanding, more motivation, and higher expectation of improvement, respectively. Data were also collected on total contact time and number of contacts with the study coordinator.

Analyses

Scores from the 6-item HAM-D were converted to the 17-item HAM-D equivalent (range, 0–52) to ease comparison with results from other studies. Subgroups were compared using chi-square tests for categorical variables and Student t tests for continuous variables. Pre-post improvement was tested using paired t tests. Pre-post improvement among subgroups was compared by repeated-measures analysis of variance.

RESULTS

Of the 23 patients enrolled, 10 were women. The mean ± SD age was 31 ± 8.2 years (range, 21–54 years),

Table 1. Time OCD Patients Took to Progress Through BT STEPS

	Study 1 (N = 40)[a]		Study 2 (N = 21)[b]	
Time	Mean	SD	Mean	SD
Minutes spent on calls				
Calls 1–4 (self-assessment)	65	36	63	17
Call 5 (first exposure/ ritual prevention)	17	27	11	4
Call 6 (fine-tuning)	6	2	6	1
Call 7 (continuing exposure/ ritual prevention sessions)	390	313	212	196
Call 8 (Troubleshooting)	13	9	22	23
Days between calls[c]				
Between calls 1 and 4	24	27	21	16
Between calls 4 and 5	10	15	12	14
Between calls 5 and 6	8	10	6	6
Between calls 7 and 9	122	92	49	42
Between calls 4 and 9[d]	129	93	64	33

[a]Data from Marks et al.[5]
[b]This study does not include the 2 patients who left the study early to begin clinician-guided care.
[c]Includes data only for patients who completed calls 8 and 9.
[d]The difference in the number of days from call 4 to 9 between Study 1 and Study 2 is significant, $p < .003$.

mean age at onset of OCD was 19 ± 6.1 (range, 10–34 years), and mean OCD duration was 12 ± 6.9 years (range, 2–28 years). Rituals involved washing (N = 14), checking (N = 9), harming self or others (N = 6), numbers (N = 4), and perfectionism (N = 3). Six patients had obsessions. Mean baseline scores were Y-BOCS, 25 ± 6.2 (range, 8–36) and 17-item HAM-D, 23 ± 8.1 (range, 9–40). Patients thus had severe OCD and marked depressive mood at study entry; 78% had previously had some clinician-guided behavior therapy. All but 1 of the 7 patients who were taking psychotropic medication (unspecified) at the time of referral had the same dose maintained throughout the study.

The study coordinator was in contact with patients a mean of 11 times during the study, mostly by phone, for a mean of 9 ± 5.9 minutes per contact. The total mean contact time was 99 ± 50.6 minutes per patient.

Patients used the IVR system over a mean of 67.2 ± 38.3 days (Table 1), taking a mean of 22 days to complete self-assessment and 45 days in doing ERP. The longest number of days between any 2 calls was between the end of assessment (call 4) and the start of ERP (call 5). Patients took a mean of 34.6 ± 26.5 days from the time they made call 1 until they completed their first ERP session (call 5). Those who did 2 or more ERP sessions took a mean of 64 days doing ERP after completing call 4.

Use of BT STEPS varied greatly among patients. One did not even complete call 1 due to obsessions. Another phoned the IVR system 50 times, including 29 calls concerning ERP sessions (call 7) and 14 for troubleshooting ERP sessions (call 8).

Mean time spent on IVR calls was 63 ± 17 minutes to complete self-assessment and 251 minutes in doing ERP (Table 1). The most time (196 ± 196 minutes) was spent on iterations of calls 7A, 7B, and 7C to plan and report on ERP sessions.

Compared with patients in the first open study, those in the present second study spent less time on call 7 concerning ERP sessions (212 ± 196 minutes versus 390 ± 313 minutes). Present patients also progressed far faster from completing call 4 to completing call 9 (64 ± 33 days versus 129 ± 93 days).

Self-Therapy With BT STEPS

Of the 21 patients who had a chance to use BT STEPS for at least 3 weeks before they came off the waiting list to start clinician-guided therapy, 16 (76%) completed self-assessment with BT STEPS. Of these 21, 10 (48%) went on to do 2 or more ERP sessions. Two of the 21 patients did not provide postbaseline data; they were included in an intent-to-treat analysis with their baseline scores imputed to endpoint.

Table 2 presents patients' mean baseline and week 12 scores on the outcome measures. In the intent-to-treat analysis, the 21 patients improved significantly on the Y-BOCS total score, the Y-BOCS compulsions subscale score, the HAM-D, the Work and Social Adjustment total score, and the Work and Social Adjustment items for home management and private leisure. The significant improvement of the total group was due solely to the improvement of the 10 patients who did 2 or more ERP sessions. Improvement was significantly greater in the 10 patients who did 2 or more ERP sessions than in the 11 patients who did fewer than 2 ERP sessions (Figure 1) on the Y-BOCS total ($F = 14.26$, $df = 1,19$; $p = .001$), the Y-BOCS compulsions subscale ($F = 7.86$, $df = 1,19$; $p = .011$), the Y-BOCS obsessions subscale ($F = 12.39$, $df = 1,19$; $p = .002$), the Work and Social Adjustment total ($F = 8.56$, $df = 1,18$; $p = .009$), and the Work and Social Adjustment social leisure item ($F = 11.24$, $df = 1,17$; $p = .004$).

Factors Associated With Self-Treatment Outcome

Patients who rated themselves as more motivated at baseline improved significantly more from the time of self-assessment to post–self-treatment on Y-BOCS total score ($r = 0.48$, $p = .028$), Y-BOCS obsessions score ($r = 0.54$, $p = .012$), and Work and Social Adjustment social leisure item score ($r = 0.60$, $p = .007$). Baseline motivation was also higher in patients who went on to do 2 or more ERP sessions (mean motivation score = 7.2) than in those who did not (mean motivation score = 4.7; $t = 3.91$, $df = 19$, $p = .001$).

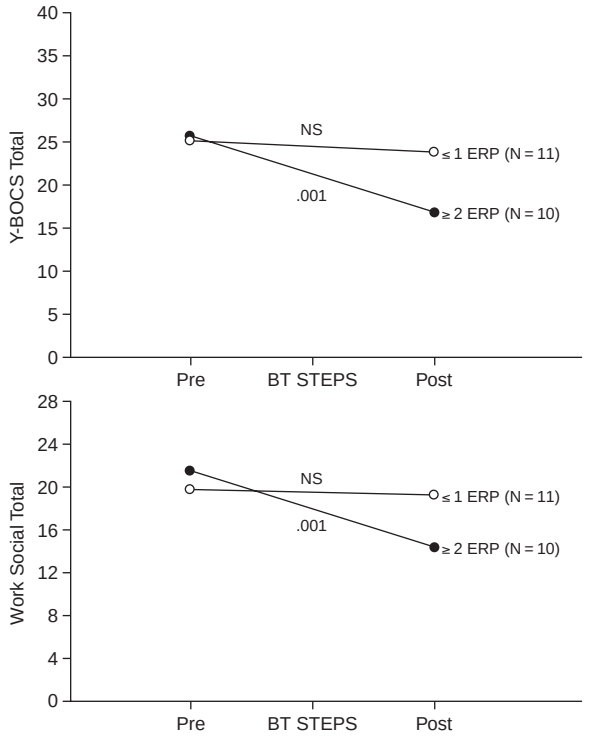
Baseline scores on expectation of improvement, understanding of treatment, Y-BOCS, HAM-D, and Work and Social Adjustment did not predict whether patients would subsequently complete 2 or more ERP sessions. Compared with patients who did less than 2 ERP sessions, those who did 2 or more ERP sessions had completed self-

Table 2. Pre-Post Improvement for OCD Patients Using BT STEPS[a]

	Baseline		Week 12 (Completers)		Completers[b]			ITT Analysis[c]		
Measure	Mean	SD	Mean	SD	t	df	p	t	df	p
Y-BOCS total	25	6.2	20	7.5	3.19	18	.005	3.12	20	.005
Rituals	13	3.0	10	4.4	3.54	18	.002	3.43	20	.003
Obsessions	11	3.8	10	3.4	1.89	18	.074	1.88	20	.075
HAM-D	22	8.1	17	8.3	2.99	18	.008	2.93	20	.008
WSA total	20	7.3	17	7.6	2.28	18	.035	2.27	19	.035
Work item	5.2	2.7	4.5	2.3	1.49	18	.154	1.49	19	.153
Home management	6.1	1.6	4.9	2.2	2.15	17	.046	2.14	18	.047
Social leisure	4.9	2.6	4.2	2.5	1.37	17	.187	1.37	18	.187
Private leisure	4.6	2.2	3.1	2.6	2.63	17	.018	2.60	18	.018
PGI[d]	…	…	2.8	1.0	…	…	…	…	…	…

[a]Abbreviations: HAM-D = Hamilton Rating Scale for Depression, PGI = Patient Global Impression scale, WSA = Work and Social Adjustment scale, Y-BOCS = Yale-Brown Obsessive Compulsive Scale. Data are from paper-and-pencil ratings.
[b]N = 19.
[c]ITT = intent-to-treat; N = 21.
[d]Only 8 patients called in during the "window" when the Patient Global Impression rating was made.

Figure 1. Improvement in OCD Patients Who Completed 2 or More Versus 1 or No Exposure and Ritual Prevention Sessions[a]



[a]Abbreviation: ERP = exposure and ritual prevention.

assessment more quickly (35 versus 13 days; t = 3.33, df = 14, p = .005) and had had more total contact time with the coordinator (79 versus 130 minutes; t = 2.58, df = 19, p = .018). The last could be an artifact from patients who did 2 or more ERP sessions having a longer period during which contact was possible with the coordinator.

Greater improvement on the Patient Global Impression score was associated with higher baseline Y-BOCS total score (r = 0.75, p = .033), baseline Y-BOCS obsessions score (r = .82, p = .014), and fewer days to complete self-assessment (r = .76, p = .029).

DISCUSSION

BT STEPS was used by 21 OCD patients for at least 3 weeks while they were on a waiting list for clinician-guided behavior therapy. Despite their marked disability as a group, the 21 patients used BT STEPS with a mean of only 99 minutes of help from the study coordinator during the mean of 67 days that they used BT STEPS. Most of the patients (76%, N = 16) completed self-assessment with BT STEPS. As expected, assessment alone did not reduce their symptoms. The 10 patients who went on to use the self-treatment exposure and ritual prevention module of BT STEPS improved significantly (mean 33% pre-post drop in Y-BOCS total). Patients who did fewer than 2 ERP sessions had no change in their Y-BOCS total scores.

Limitations of the study are its open design and small number of subjects. Another is that it used only self-ratings. However, patient-clinician reliability for the Y-BOCS and the Work and Social Adjustment scale is usually high.

The outcome of this replication study with patients in the United Kingdom is similar to that of the first study of 40 patients in the United States and the United Kingdom, 87.5% of whom completed self-assessment and 42.5% of whom went on to do ERP.[5,6] In that study, a 30% pre-post reduction in Y-BOCS scores also occurred in patients who did 2 or more ERP sessions. These reductions in Y-BOCS total scores are similar to those seen typically in OCD patients taking serotonin reuptake inhibitor medication.[11–14]

Clinical outcomes across the 2 open studies were similar, but patients in the present study progressed faster from the end of self-assessment (call 4) to the end of BT STEPS (call 9) and spent less time on call 7 concerning ERP. This more rapid progress might reflect that the present patients were slightly more encouraged by the coordinator than were patients in the first study, and this occurred despite present patients having been more severely ill at baseline than those in the first study. More severely ill patients may need more personal encouragement to use BT STEPS well. More study is needed to determine the optimum amount of brief human support for computer-guided self-therapy systems.

Treatment systems combining IVR technology and other materials such as manuals or videotapes promise to help many patients who need it. They extend other work showing the value of manuals for anxiety disorders[2,15] and depression[17] (reviewed by Scogin et al., 1996[16]). Few anx-

iety disorder sufferers identified in community surveys have been treated for their problem. Even those referred for treatment cannot all access the few behavior therapists available. IVR systems can offer effective (home-based) care to more of these patients and without the need to train more therapists.

IVR-based self-treatment systems, used alone or as a supplement to clinician-guided care, offer advantages over clinician-guided care alone. IVR-based treatment requires far less clinician time than does traditional clinician-guided treatment. Treatment by phone from home can help patients avoid the stigma often associated with psychiatric contact. Patients can access the IVR system day or night. In the present study, 53% of patients' calls to the BT STEPS IVR system were made outside of typical office hours, as were 56% of calls from depressed patients using a similar IVR-plus-booklet system for treating depression.[18] The system can also prepare patients for subsequent clinician-guided care.

The cost of systems such as BT STEPS compares favorably to that of medication and of clinician-guided care. They save 80% of the per-patient time needed by a clinician to guide ERP. A regular BT STEPS Clinic at the Maudsley Hospital, London, now serves the whole United Kingdom (users' health authorities pay the cost) and offers access to patients from abroad; the computer is in the United States (in preparation). The development cost for an IVR-based treatment system is but a tiny fraction of the average $300 million cost of getting a new drug into U.S. Food and Drug Administration–approved clinical use.

In brief, these open results support those from a previous open study and justify a controlled trial. Almost half the OCD patients used an IVR-based system to guide 2 or more exposure and ritual prevention sessions; they improved significantly as a group. The drop in their Y-BOCS scores resembled that seen after serotonin reuptake inhibitor medication. Higher baseline motivation and rapid completion of self-assessment each predicted greater compliance (doing 2 or more ERP sessions) and better outcome.

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