

Home self-assessment of obsessive-compulsive disorder

Use of a manual and a computer-conducted telephone interview: two UK-US studies

I. M. MARKS, L. BAER, J. H. GREIST, J. M. PARK, M. BACHOFEN, A. NAKAGAWA, K. W. WENZEL, J. R. PARKIN, P. A. MANZO, S. L. DOTTL and J. M. MANTLE

Background Two studies tested whether subjects with obsessive-compulsive disorder could successfully use BT STEPS, a computer-aided system, to perform self-assessment for self-treatment of obsessive-compulsive disorder by exposure and ritual prevention.

Method Subjects were given a self-guiding manual and could use a touch-tone telephone to access computer-controlled Interactive Voice Response interviews at their convenience from home. Using the BT STEPS system, patients rated themselves and worked out a plan for individually tailored self-exposure therapy.

Results Outcomes were similar in the two studies. Of the 63 subjects who used BT STEPS, 84% completed the self-assessment module. Most calls were made outside usual office hours. As expected, subjects did not improve merely by completing self-assessment. However, completion of self-assessment predicted later improvement with self-exposure therapy.

Conclusions Most subjects successfully completed self-assessment using BT STEPS from their homes.

Declaration of interest BT STEPS is a trademark of Pfizer, Inc. I.M.M., L.B. and J.H.G. have a financial interest in BT STEPS.

Brief behaviour therapy by exposure and ritual prevention improves the symptoms of obsessive-compulsive disorder effectively (Greist, 1990; Marks, 1997) and lastingly (O'Sullivan & Marks, 1990; Foa & Kozak, 1996). However, only a small number of sufferers are ever assessed for such treatment, and few clinicians provide behaviour therapy (Swinson *et al*, 1992; Goisman *et al*, 1993). Because methods used by clinicians to assess sufferers of obsessive-compulsive disorder and to guide exposure and ritual prevention therapy have been sufficiently specified, development of computer-based assessment and therapy systems is possible.

COMPUTER SELF-HELP BY SCREEN OR BY TELEPHONE

Computerised assessment and care programmes developed for people with other disorders have typically been delivered by personal computers, with subjects using a keyboard and/or mouse and seeing text and pictures on a screen, or by hand-held devices carried by subjects. In two randomised controlled trials, self-therapy guided by personal computers helped subjects improve as much as did similar instructions from clinicians. The first study, which administered self-exposure therapy for panic/agoraphobia (Ghosh & Marks, 1987) and other phobias (Ghosh *et al*, 1988), showed that personal computer-based instruction was as effective as instruction from a clinician or a manual up to six-months follow-up. The second study, which delivered cognitive-behavioural therapy for non-suicidal depression (Selmi *et al*, 1990), showed that instructions from a personal computer or from a clinician were equally effective up to two-months follow-up and that both were more effective than being on a treatment-on-demand waiting list.

In the above two randomised controlled trials, subjects read information on a desktop computer screen and responded by typing on a keyboard. However, subjects can also have a computer-conducted interview using Interactive Voice Response technology, which presents prerecorded natural-voice files over any touch-tone telephone and asks the user to respond to questions or to make choices from menus either by speaking or by pressing keys on the telephone keypad. The keypresses or spoken responses trigger the next text segment to be heard. Such an Interactive Voice Response system has been used to help smokers give up smoking (Schneider *et al*, 1995). The current study reports promising results from two UK-US studies involving an Interactive Voice Recognition system that allows subjects with obsessive-compulsive disorder to perform self-assessment and self-treatment. Our major hypotheses for both studies were that:

- (a) The majority of subjects would be able to complete self-assessment using the Interactive Voice Recognition system;
- (b) Subjects would show significant improvement in obsessive-compulsive disorder severity between baseline and the end of treatment;
- (c) Subjects would show significant improvement in disability between baseline and the end of treatment;
- (d) Subjects would be more likely to improve in obsessive-compulsive disorder severity as they completed more exposure and ritual prevention practice calls.

In addition, we had several exploratory hypotheses regarding predicting degree of response from baseline motivation, obsessive-compulsive disorder severity, and depression severity.

This paper reports the results of self-assessment (Hypothesis a). Detailed results of self-treatment in study 1 appear in Greist *et al* (1998) (Hypotheses b, c and d).

METHOD

BT STEPS system

BT STEPS is a system for self-assessment and self-treatment of obsessive-compulsive disorder which consists of a manual linked to a computer-conducted interactive voice response interview. It was developed in a joint, transatlantic project in Boston, Massachusetts, London, and Madison, Wisconsin. The version of BT STEPS used in the

present study had 886 text segments, in digitally-recorded natural voice, whose presentation depended on PDID (Dean Foundation for Health, Research and Education, Inc., Middleton, WI), a Parameter Driven Interview Driver (version 2), which had more than 70 discrete functional capabilities. Most of the text segments gave information about behaviour therapy, supplemented the information in the manual, or gave encouragement or praise. Some text segments asked subjects to answer questions by pressing numbers or symbols on the telephone keypad. Other text segments asked subjects to answer questions with brief statements (e.g. what their personalised goal was for a particular exposure and ritual prevention session); such answers, recorded in the subject's voice, were retrieved later as needed (e.g. their goal statements were played back to them before they began the exposure and ritual prevention sessions).

BT STEPS is divided into nine parts. Each involves reading a chapter in the manual and then calling the computer. The first four steps guide the self-assessment. Step 1 outlines how to carry out behaviour therapy by self-exposure to selected triggers and self-imposed ritual prevention and explains how to use the Interactive Voice Recognition system. Step 2 explains exposure and ritual prevention in detail, gives illustrative case histories, and asks subjects to identify their main type(s) of rituals and obsessions and to calculate how much these affect their lives in terms of time and money. The computer asks them to rate themselves on the Yale-Brown Obsessive-Compulsive Scale (YBOCS; Goodman *et al*, 1989) and the Work and Social Adjustment Scale (Marks, 1986) and to enter cost estimates for their disorder. Step 3 asks subjects to read through a list of 185 stimulus triggers for rituals and obsessions which were collected from the records of 400 subjects with obsessive-compulsive disorder in Boston and London and to highlight those stimuli that trigger their own rituals and obsessions. Next, they rate how much discomfort each highlighted trigger causes them and sort their triggers by discomfort ratings. Step 4 helps subjects decide whether to involve a relative or friend as an exposure co-therapist and asks the potential co-therapist to read relevant parts of the manual. In the Step 4 call, patients indicate whether they will involve an exposure co-therapist, and they rate symptoms of their

depression on the Bech six-item version of the Hamilton Depression Rating Scale (HAM-D; Bech *et al*, 1981).

The final five steps teach subjects how to perform effective self-treatment using exposure and ritual prevention. Step 5 teaches subjects to personalise their first trigger (cue) for rituals or obsessions into a detailed goal as the basis for suitable exposure and ritual prevention tasks and helps them choose coping tactics which will enable them to continue tasks until they have habituated to the discomfort evoked by them. The computer asks subjects to key in the number of the trigger they chose from the manual as the basis of their first personalised goal for exposure and ritual prevention, and to state by voice what that goal is and what difference achieving it would make in their lives. They also key in the anticipated discomfort associated with each trigger, whether they are involving a co-therapist, and whether they will commit at least one hour per day to the behaviour therapy. Step 6 asks subjects for feedback on their first session and advises them how to improve subsequent sessions, suggests what to do if they find their goals too difficult, have not tried hard enough, do not understand exposure and ritual prevention, believe too strongly that harm will result if they practise it, or are unable to perform it because a relative or friend is unavailable. Step 7 helps subjects learn to habituate to each trigger in turn by performing self-exposure sessions. This step may be repeated as many times as necessary, with new triggers being added as subjects habituate to earlier ones and they learn more about planning and doing exposure and ritual prevention. Step 8 helps identify problems in the subjects' self-therapy sessions, gives tips to overcome those difficulties, and advises them how to reduce obsessive thoughts (ruminations). It can be accessed repeatedly after Step 7 has been completed at least once. Step 9 helps subjects build on their improvements, prevents relapse by teaching them how to anticipate and deal with setbacks, and encourages them to participate in work/social/leisure activities in the time freed by stopping rituals and obsessions.

Subjects could repeat the telephone calls if necessary (e.g. if they were interrupted in the middle of a call or wanted time to think about their answers). After subjects completed the calls, the computer generated feedback sheets containing information about what they had entered by

telephone (see Appendix for examples). These sheets were faxed to each of the three site coordinators who posted the sheets to the subjects.

Study settings

BT STEPS was tested in two studies, each using a computer sited in Madison, WI. The first was run both with UK and with USA patients. The second, run only with UK patients, was done to check the robustness of the findings of the first study in a new sample, to see how subjects fared with clinician-guided care subsequent to BT STEPS, and to see if adding a 'personal touch' to the system would help move subjects through self-assessment more quickly (i.e. the coordinator signed the faxed feedback sheets, added brief written praise for progress, and, for subjects who were having trouble progressing, suggested that they re-read certain steps in the manual). Also, based on observations from Study 1, additional information was collected in Study 2 (e.g. telephone contact time with subjects, and a measure of subjects' motivation at baseline).

Each study had local institutional review board approval, and participants gave written informed consent. Subjects were told that, after completing the study, they could receive care from a clinician if necessary.

Subjects

There were 63 participating subjects, 40 in Study 1 (Boston, $n=12$; London, $n=15$; Madison, $n=13$), and 23 in Study 2 (London). They had been referred for treatment of obsessive-compulsive disorder by health professionals; the Madison site also advertised for subjects in newspapers. The Structured Clinical Interview for DSM-III-R (Spitzer *et al*, 1988) was administered to subjects in Study 1 to confirm their disorder diagnosis (DSM-III-R criteria (American Psychiatric Association, 1987) are very similar to those of ICD-10 (World Health Organization, 1992)). Most had the interview face-to-face; a few had it administered by telephone. Subjects in Study 2 had previously been screened face-to-face for obsessive-compulsive disorder using ICD-10 criteria and placed on a waiting list for clinician-guided behaviour therapy as out-patients or in a hostel, where subjects reside for several weeks with staff present eight hours a day.

Subjects were invited to use BT STEPS if they had a YBOCS total score of 16 or more and a YBOCS compulsion score of 8 or more. Those with a YBOCS total score of less than 16 needed to have a YBOCS compulsion score of 10 or more to participate. Entry criteria required that subjects were not severely depressed and had no plans for suicide, that their obsessive-compulsive disorder had preceded any comorbid major depression by one month or more, and that they had no psychotic or substance use disorder or a personality disorder that would disrupt compliance. Subjects were not included if they had a history of adequate behaviour therapy for obsessive-compulsive disorder. Those who were on psychotropic medication (20 of 40 in Study 1, 8 of 23 in Study 2) had to have been on a stable dose for at least three months and had to agree not to change it while working through BT STEPS. One subject was taking buspirone; the remainder were on potent serotonin reuptake inhibitors.

Self-assessment procedure

Subjects were given the BT STEPS manual and a personal identification number for use with the computer. Four UK subjects were loaned touch-tone telephones to use at home and two used pay-telephones. Three of the 15 UK subjects in Study 1 and eight of the 23 UK subjects in Study 2 never saw the coordinator because they lived too far away; they were instructed by telephone and sent the manual by post.

After they received their BT STEPS materials, subjects had no further contact with the site coordinator unless they had technical questions (e.g. what to do if they had hung up in the middle of a call). Subjects were asked to consult their manual or their referring clinician about clinical queries. All were asked to use BT STEPS daily. The coordinator telephoned subjects who had not made at least one call in the past week to deal with any technical questions that may have arisen, but did not discuss self-assessment. The London coordinator telephoned all the London subjects in Study 1 at least once ($M=3.2$ calls, range=1–6 calls), and all the subjects in Study 2 at least three times ($M=10$, range=3–20). The total mean time spent in telephone contact with subjects by the coordinator in Study 2 was 99 minutes per subject (comparable data were not collected in Boston and Madison).

Measures

Baseline predictors

Baseline obsessive-compulsive disorder severity was assessed using the 10-item YBOCS (score range 0–40). It was administered by the Interactive Voice Recognition system in both studies. Severity of baseline depression was calculated using the Bech six-item version of the HAM-D (score range 0–24), which was administered by the Interactive Voice Recognition system in both studies. These were then converted to the scale used with the 17-item HAM-D (range 0–52) for ease of comparison with results from other studies. Baseline disability was assessed using the four-item Work and Social Adjustment Scale, which was administered by the Interactive Voice Recognition system in both studies. These four items assess functioning in work, home management, social leisure, and private leisure (score range 0–32).

A six-item paper and pencil questionnaire to assess the understanding of exposure therapy was administered at baseline and Week 12 (Study 2 only); higher scores indicate better understanding. Motivation to carry out BT STEPS (Study 2 only) was assessed using a single-item paper and pencil scale (score range 0–8, where 0 is lowest and 8 is highest expectation) at baseline and every two weeks after completing Step 5.

Therapy engagement measures

The computer recorded whether or not each patient completed all parts of each step; completion of self-assessment was defined as the completion of Steps 1–4. The time spent on self-assessment calls was also measured. The duration of each call was automatically recorded by the computer. Additionally, the number of days to complete assessment calls and the date and time of each call was recorded by the computer. The number of exposure and ritual prevention calls completed were also monitored by the computer, each call beginning or reporting on an exposure task. The first task, completed in Call 5, was considered as a 'practice task'. Subsequent exposure tasks were completed in unlimited repetitions of Call 7.

Outcome measures

The 10-item YBOCS was administered to ascertain endpoint obsessive-compulsive disorder severity. Endpoint disability status

was assessed using the four-item Work and Social Adjustment Scale. Global obsessive-compulsive disorder symptom changes were rated using the single-item Patient Global Improvement Scale (score range 1–7, with 1=very much improved, 2=much improved, 3=slightly improved, 4=unchanged, 5=slightly worse, 6=much worse, 7=very much worse; Guy, 1976) was administered by the Interactive Voice Recognition system in both studies. A score of 1 or 2 was considered to represent a treatment 'response'.

Specific changes in obsessive-compulsive disorder trigger discomfort scores were collected by the computer each time subjects telephoned to participate in an exposure and ritual prevention session for a particular trigger. Subjects indicated the amount of discomfort evoked by each trigger they had selected on a 0 (no discomfort) to 8 (extreme discomfort) scale.

Statistical analyses

Major hypotheses were tested by two factor ANOVA with repeated measures on one factor (time), and a between group factor of Study number (1 or 2). Separate ANOVAs were conducted for the two major continuous outcome measures. Categorical measures were analysed by contingency table analysis with significance tests by χ^2 as appropriate. Associations between predictors and outcome were analysed by correlation coefficients. Analyses of major research hypotheses were tested at $P=0.05$, and exploratory analyses were tested at $P=0.01$.

RESULTS

Subject characteristics

About two-thirds of the subjects who were offered a chance to do BT STEPS accepted the offer in Study 1. Of 32 subjects invited to participate in Study 2, 23 (72%) agreed to use BT STEPS. Compared to the 23 consenting subjects in Study 2, the nine who refused to try BT STEPS had less past behaviour therapy ($P<0.01$) and were more often men ($P=0.05$). Consenting and refusing subjects had similar mean age, duration of obsessive-compulsive disorder, and type of ritual. Six of the nine refusers gave reason(s) for refusing: four wanted a human clinician or thought a computer could not deal with their personal problems, two did not think self-help therapy could benefit them, and two did not want to take part in research; one subject had dropped out from the first study of BT

STEPS (these data are not available for Study 1).

In the two studies 34 of the 63 subjects were men, the subjects' mean age was 33 and their obsessive-compulsive disorder was marked. Mean duration of the disorder was 12 years (s.d.=6.9) in Study 2 (this information is not available for Study 1). Subjects told the computer that their rituals primarily involved washing ($n=44$, 70%), reassurance-seeking ($n=46$, 73%), checking ($n=50$, 79%), ordering/tidying ($n=35$, 56%), and, less often, hoarding ($n=18$, 29%). Surprisingly, despite being selected to participate in the study because they had obsessive-compulsive disorder with rituals, subjects said their most common category of obsessive-compulsive problem was, in fact, obsessions. Subjects had moderately depressed mood and moderate work and social disability. When compared with the subjects in the US in Study 1, subjects in the UK (pooled across Studies 1 and 2) were more severely ill as measured by their mean scores on the YBOCS, the HAM-D, and the Work and Social Adjustment Scale work and social leisure items (see Table 1).

Self-assessment

Of the 40 subjects in Study 1, 87.5% ($n=35$) completed the self-assessment; 78% ($n=18$) of the 23 subjects in Study 2 completed self-assessment (Hypothesis a). Failure to complete self-assessment was associated with slightly more severity of obsessive-compulsive disorder at baseline in Study 1, but less severity at baseline in Study 2. In Study 2 there were no significant differences for age, age at onset of the disorder, gender, baseline obsessive-compulsive disorder severity (YBOCS), baseline depression (HAM-D), or understanding about, expectation regarding, and motivation for treatment between the 18 subjects who completed self-assessment and the five who did not. However, the subjects who completed the self-assessment were more severely disabled on the Work and Social Adjustment work item at baseline ($M=21.9$, s.d.=7) than the non-completers ($M=14.8$, s.d.=2.75; $t=2.9$, d.f.=17, $P<0.01$).

The majority of subjects indicated a need to involve a relative or friend as an exposure co-therapist (68% of subjects in Study 1 and 57% in Study 2).

Time required for self-assessment

The time subjects spent on self-assessment calls and the number of days they took to

complete them were similar in the two studies. Overall, they spent a mean total of 64 minutes doing the self-assessment calls (Table 2 shows a breakdown by study and call). They spent slightly more time on the telephone if they had more severe pathology. After making Call 1, subjects took an average of 23 days to complete self-assessment. Compared to Study 1 subjects, Study 2 subjects took fewer days to progress from Call 2 to Call 3 and from Call 3 to Call 4. This may reflect the greater amount of encouragement to move quickly through BT STEPS that subjects received from the coordinator in Study 2. Greater time spent on self-assessment calls correlated significantly with subsequent improvement (Table 3).

Self-treatment with BT STEPS

After completing self-assessment, 43% of the subjects in Study 1 and 48% of the subjects in Study 2 went on to do the self-treatment module. For those subjects who completed more than a single exposure and ritual prevention task, there was a significant decrease in both YBOCS total score ($F(1, 32)=24.1$, $P<0.001$) and Work and Social Adjustment total score ($F(1,32)=29.9$, $P<0.001$), and neither change differed significantly between Study 1 and Study 2 (both interaction effects $P>0.15$). In addition, 20/28 (71%) subjects who began self-treatment with BT STEPS rated themselves as 'responders' on the Patient Global Improvement Scale after treatment (Hypotheses b and c; details in Greist *et al.*, 1998).

Relation of outcome to number of exposure sessions

For those subjects who began self-treatment with BT STEPS, the number of self-exposure sessions they engaged in correlated strongly with the number of points decrease

they rated on the YBOCS during treatment ($r=0.62$, $P=0.001$), but did not relate significantly to decrease in Work and Social Adjustment score ($r=0.10$, $P>0.60$; Hypothesis d). Subjects did not improve merely by completing self-assessment: in both studies improvement occurred only if they went on to do self-exposure in Steps 5–9.

Subjects' scores on the self-assessment measures and the amount of time they spent completing the assessment steps predicted their success with BT STEPS-guided self-therapy. In Study 1, subjects were more likely to do two or more exposure and ritual prevention sessions (rather than one or none) if they had lower baseline YBOCS total scores ($P<0.01$), lower baseline Work and Social Adjustment scores ($P<0.01$), or lower trigger discomfort scores ($P<0.01$).

In Study 2, subjects were more likely to perform two or more exposure and ritual prevention sessions (rather than one or none) if they were more highly motivated at baseline ($M=7.2$ v. $M=4.6$, $P<0.001$) or completed all four self-assessment calls quickly (11 days v. 30 days, $t=3.15$, d.f.=16, $P<0.01$). Also, higher trigger discomfort ratings during self-assessment related to greater reduction in work disability from baseline to the end of the study ($r=0.71$, $P<0.01$).

DISCUSSION

Subjects with obsessive-compulsive disorder successfully performed self-assessment at home using the BT STEPS manual and touch-tone telephone interview system. The assessment indicated the severity and type of their disorder. The system explained the principles behind exposure and ritual prevention therapy and helped subjects pinpoint, record, and rate triggers of their rituals and obsessions in order to prepare for subsequent self-treatment.

Table 1 Baseline scores that differed significantly between the UK and US sites

| Baseline scores | UK ¹ | US ² | t | d.f. | P |
|-----------------------------------|-----------------|-----------------|------|------|--------|
| YBOCS | 28 | 23 | 3.23 | 59 | <0.002 |
| HAM-D | 13 | 10 | 2.10 | 53 | <0.04 |
| Work and Social Adjustment Scale: | | | | | |
| Work item | 5.7 | 4.0 | 2.80 | 57 | <0.007 |
| Social leisure item | 5.2 | 3.7 | 2.61 | 57 | <0.012 |

YBOCS, Yale-Brown Obsessive-Compulsive Scale; HAM-D, Hamilton Depression Rating Scale.

1. Studies 1 and 2.

2. Study 1 only.

Table 2 Time (mean and s.d., in minutes) spent on each self-assessment call

| Call number | Topic | Study 1 | | | Study 2 | | |
|-------------|---|---------|------|----------------|---------|------|----------------|
| | | Mean | s.d. | n ¹ | Mean | s.d. | n ¹ |
| 1 | Learning about BT STEPS | 9 | 3 | 40 | 10 | 4 | 23 |
| 2 | Identifying major rituals and their costs | 19 | 9 | 39 | 19 | 8 | 19 |
| 3 | Identifying triggers and setting goals | 14 | 9 | 37 | 14 | 8 | 18 |
| 4 | Involving a relative/friend in co-therapy | 23 | 23 | 35 | 18 | 5 | 18 |
| 1-4 | Total for all four calls | 65 | 36 | 35 | 63 | 17 | 18 |

1. n=number of subjects who completed the call.

Success of self-assessment

Two-thirds of the subjects who were offered a chance to self-assess their obsessive-compulsive disorder using BT STEPS accepted and over three-quarters of those completed self-assessment. They accomplished this in three to four weeks and, on average, spent a total of only about an hour making the telephone calls. The five subjects who failed to complete self-assessment with BT STEPS in Study 2 also failed to complete subsequent clinician-guided exposure and ritual prevention therapy.

By the end of their self-assessment, the subjects had rated the severity of their obsessive-compulsive disorder, their level of depression and the degree of impairment in their work and social lives due to their disorder. They had identified the situations and objects that triggered their symptoms and rated the discomfort they felt when confronted with each trigger. The system also had explained the principles of exposure and ritual prevention for obsessive-compulsive disorder to them and helped to prepare them for subsequent therapy. All this was accomplished conveniently by the subjects with minimal demands on a clinician.

Self-assessment and subsequent improvement

As expected, subjects did not improve merely by completing self-assessment. However, those who completed self-assessment more quickly tended to perform more sessions when working through the therapy module. Performing more exposure and ritual prevention sessions was associated with better outcomes (Greist *et al*, 1998). Completing self-assessment in fewer days was also associated with greater reduction in trigger discomfort scores by the end of the studies.

Caveats

Caution should be used when generalising these results. The two studies described here were open trials run without a comparison group. A multi-site, randomised controlled trial comparing BT STEPS to alternative therapies is currently under way. Also, it is not known how successful self-assessment by manual plus computer system would be without an initial diagnostic interview with a clinician and without telephone contact from a coordinator to subjects who do not call the computer within a predetermined period of time. It is also possible that self-assessment might be equally successful using only the manual, without the computer program; however, subjects using the manual alone may need more input from a clinician. Additionally, without the Interactive Voice Recognition portion of BT STEPS, interactive feedback and the immediate collection, surveillance, retrieval, and analysis of data would not be possible.

Benefits of Interactive Voice Recognition systems

Interactive Voice Recognition-based systems such as that of BT STEPS offer significant benefits, both in the clinical setting and in clinical research. Such self-assessment and self-treatment are time

efficient and cost effective and, because they are easy to use, can allow more people with untreated obsessive-compulsive disorder in the community to be identified and assessed. Computer assessment can also help prepare them for behavioural treatment administered by a clinician or a computer-aided system such as BT STEPS. Additionally, subjects who are unable to get to a clinic due to the severity of their disorder or other disability, distance or both, can be assessed and treated in their own homes. For example, a subject enrolled in one of the present two studies was disabled by multiple sclerosis and lived 200 miles from the study site, yet was able to participate fully in the study.

Interactive Voice Recognition-based therapy systems also promise to enhance research on the treatment of disorders. A central data set of the clinical state of large numbers of subjects can be collected and analysed more quickly and easily using a computer-based system than in other ways, when the database is set up in advance to allow such analyses. A modular design permits dismantling studies so that effective and ineffective therapy elements can be distinguished. In addition, such systems can be updated to reflect current knowledge and new, effective techniques.

In summary, two-thirds of subjects in the UK and the US who were offered home self-assessment for obsessive-compulsive disorder using a computerised Interactive Voice Response touch-tone telephone interview system and a supplementary manual accepted the offer, and 84% of those who began the self-assessment completed it. Initial obsessive-compulsive disorder severity and self-assessment measures predicted which subjects went on to do self-exposure therapy and which of those improved with it. These results suggest that an Interactive Voice Recognition-administered assessment of obsessive-compulsive disorder is feasible,

Table 3 Significant correlations between time spent on calls and outcome scores

| Outcome | Study 1 (Calls 1-4) | | Study 2 (Call 4 only) | |
|-----------------------------------|---------------------|-------|-----------------------|-------|
| | r | P | r | P |
| YBOCS total | 0.34 | <0.04 | 0.51 | <0.03 |
| YBOCS obsessions | 0.38 | <0.03 | 0.47 | <0.05 |
| Work and Social Adjustment Scale: | | | | |
| Total | 0.42 | <0.02 | - | - |
| Work item | 0.45 | <0.01 | - | - |

YBOCS, Yale-Brown Obsessive-Compulsive Scale.

offers a flexible alternative to traditional assessment strategies, and can be used to help prepare subjects for behaviour therapy.

APPENDIX

Examples of computer-generated feedback sheets received by subjects after Call 2 and Call 3.

Call 2: Your rituals and their costs

CONGRATULATIONS!

You've completed:

- Introduction to behaviour therapy
- Identifying your major types of rituals and their costs
- Baseline YBOCS
- Work/social adjustment scale
- Suicide risk assessment.

Your major ritual types are:

- Cleaning
- Ordering
- Hoarding
- Obsessions.

Cost of your rituals:

- \$20.00 per week
- \$80.00 per month
- \$960.00 per year.

All your rituals together consume:

- 42 hours per week
- 180 hours per month
- 2190 hours per year

That's 38% of your waking life (assuming 8 hours of sleep).

Please read Step 3 in your manual to prepare for Call 3.

Call 3: Triggers for rituals and their severity

A BIG JOB WELL DONE!

You've completed Step 3 of BT STEPS (identifying rituals)

Your most severe trigger is:

Trigger #115 – touching, or thinking I've touched, my nose.

Goal #1 – I'll expose myself to touching, or thinking I've touched, my nose daily without washing or doing any other ritual for an hour afterwards.

Please read Step 4 in your manual to prepare for Call 4.

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CLINICAL IMPLICATIONS

- In the two studies, most patients with obsessive-compulsive disorder completed self-assessment for self-exposure therapy by telephoning a computerised interactive voice response system used with a manual.
- The self-assessment was done at home at any time of day or night, mostly outside usual office hours.
- Completion of such self-assessment predicted later improvement with self-exposure therapy, guided either by computer or face-to-face by a therapist.

LIMITATIONS

- Both studies were uncontrolled.
- A clinician diagnosed patients pre-self-assessment and a coordinator telephoned them if they had not telephoned the computer for a week; patients might not have done so well without the brief human contact.
- Some patients did not have a touch-tone telephone at home to use the computer system but might arrange to use one elsewhere.

ISAAC M. MARKS, MD, Institute of Psychiatry, London; LEE BAER, PhD, Massachusetts General Hospital; JOHN H. GREIST, MD, Dean Foundation for Health, Research and Education, Middleton, WI; JE-MIN PARK, MD, MARTIN BACHOFEN, MD, AKIKO NAKAGAWA, MD, Institute of Psychiatry, London; KEITH W. WENZEL, BS, Dean Foundation for Health, Research and Education, Middleton, WI; J. RICHARD PARKIN, MRCPsych, Institute of Psychiatry, London; PETER S. MANZO, MSW, Massachusetts General Hospital; SUSAN L. DOTTL, PhD, JULIA M. MANTLE, MS, Dean Foundation for Health, Research and Education, Middleton, WI

Correspondence: Professor Isaac Marks, Institute of Psychiatry, London SE5 8AF. Tel: 0171-919-3365. Fax: 0171-740-5244. E-mail: I.Marks@iop.bpmf.ac.uk

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