Computer Interviews for Depression Management

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Depression is underrecognized, underdiagnosed, and undertreated, with resultant increases in unnecessary suffering, morbidity, and mortality. A decade of admonitions to practitioners to improve our practices has made little impact on these recognized deficiencies. Screening, diagnosis and monitoring for depression, education about depression, and even self-help treatments for depression can all be improved by using direct patient-computer interviews. Computer interviews gather information from patients and give information to them, complementing, supplementing, and reinforcing clinician functioning. Available computer programs can help us reduce the gap between what is possible and what is practiced—a laudable goal. *(J Clin Psychiatry 1998:59[suppl 16]:20–24)*

"If there be a hell upon earth, it's to be found in a melancholy man's heart."

—Robert Burton, *Anatomy of Melancholy*, 1621

MANAGEMENT OF DEPRESSION: CONTEXT

Depression is common, costly, recurrent, and too often lethal. Depression is also part of the psychiatrist's stock-in-trade, and we often see patients whose management has been difficult. Still, the majority who suffer depression are cared for by primary care physicians, nonphysician mental health professionals, or alternative health practitioners.

In the largest and most comprehensive study to date, primary care physicians recognized depression in less than half of the depressed individuals they saw.[1] Only 41% of the patients diagnosed as depressed by primary care physicians received any pharmacotherapy: just 12% received an antidepressant; 19% had only minor tranquilizers; and 11% received both. No more than 6% of depressed patients in the community had consulted a psychiatrist, and of those who seek care in prepaid health plans, less than half as many (10%) are seen by psychiatrists as in fee-for-service care (22%). On average, depressed patients received 10 minutes or less of advice and education from primary care physicians, whereas psychiatrists and psychologists offered some psychodynamic and behavioral therapies in longer sessions. A combination of counseling and appropriate antidepressant medication was the most effective form of management as assessed by reductions in symptoms and improvement in functioning. If caregivers were forced to a dichotomous choice, therapy alone achieved better results than medication alone. In managed care settings, psychiatrists achieved better outcomes than general medical practitioners, but costs for psychiatric care were greater. When psychiatrists in different practice settings were compared, fee-for-service providers achieved better results than those practicing under the constraints of managed care.

Given this discouraging picture, worsened under the strictures imposed by managed care that is now the way of life for over half of all Americans, what help might be available to reverse this downward spiral and increase the availability and quality of care for depressed patients? This article reviews the role of patient-computer interviews for assessment, education, and treatment of individuals with depression.

SCREENING AND DIAGNOSIS

Screening, diagnosis, and monitoring are the assessment triad across all of medicine. If more of those who suffer depression could be identified and brought to effective treatment, more would benefit. A screening instrument with high sensitivity (low false-negative rate) and acceptable specificity (low false-positive rate) could guide those screening positive to clinicians for more definitive evaluations. The Zung Self-Rating Depression Scale (SDS) has been adapted for administration by an interactive voice response (IVR) program and used for 3 years on National Depression Screening Day[2]; 21,037 individuals were screened in 1995, 32,300 in 1996, and 116,374 in 1997. Clearly this screening approach can be scaled upward rapidly and at small cost. With IVR, people can dial

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an 800 telephone number from any Touch-Tone telephone, which serves as their computer terminal. They hear information and questions and answer by pressing number keys on the Touch-Tone keypad. One such question is, "I feel downhearted, blue and sad. If none or a little of the time, press 1; if some of the time, press 2; if a good part of the time, press 3; if most or all of the time, press 4." The National Depression Screening Day program has been made available through employee assistance programs and with support from Eli Lilly and Company. Employers are beginning to recognize the benefits of helping depressed employees, and Eli Lilly and Company have both humanitarian and monetary reasons for supporting this screening program. More varied is how much managed care companies want members to recognize their depression and come for treatment for which the managed care company must pay.

Broader screening that covers more than just depression helps ensure that comorbid and separate disorders are not overlooked. A number of structured interviews have been prepared, and the Primary Care Evaluation of Mental Disorders (PRIME-MD),[3] the Structured Clinical Interview for DSM-III-R (SCID),[4] the Mini-International Neuropsychiatric Interview (MINI),[5] and the Symptom Driven Diagnostic System for Primary Care (SDDS-PC)[6] have been validated in comparisons with clinicians. Computer interview versions of these screening/diagnostic assessment programs are available and have the advantage of providing the clinician with a thorough structured diagnostic interview that complements the clinician's more intuitive diagnostic style. The clinician receives a screening/diagnostic report that can be reviewed quickly. Two heads are usually better than one, even when one is a computer.

MONITORING

There has been a great deal of talk about monitoring the quality of care and assessing outcomes, but in routine clinical practice it has not been feasible to systematically monitor status and change on important dimensions such as symptoms and quality of life. To address this problem, a number of assessments of severity and change used in research have been adapted for administration by computer in clinical settings. Patients may complete computer assessments in the office on desktop computers or from any Touch-Tone telephone if the assessments are available in IVR format. Clinicians receive printouts of patient reports and can see changes over time at a glance. Having these data readily available permits more informed discussions with the patient and better decision making about treatment modifications. Computer assessments make this kind of change and outcomes monitoring feasible in routine clinical practice for the first time. Being able to monitor response to treatments on important dimensions reliably and accurately should improve patient outcomes—and the incomes of those who can demonstrate high quality in the care they provide.

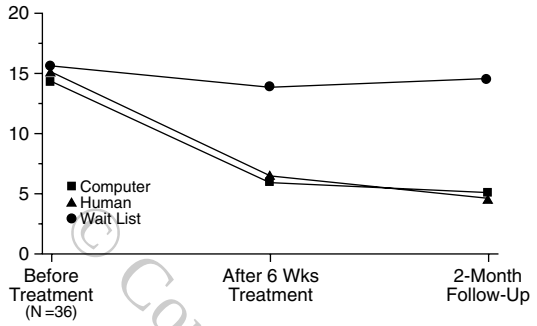
EDUCATION

Depression diminishes functioning and can vitiate the very essence of one's being. Educational information about depression helps restore hope by offering a proper perspective on the disorder and its treatments. Pamphlets, booklets, and books can convey helpful information but are passive media, sometimes difficult for those whose depression impairs concentration, attention, memory, interests, and energy. Twenty-two percent of the American population is functionally illiterate, and 44% read no book in a year.[7] Interactive computer programs that provide educational information tailored to the patient's interests and reading comprehension are likely to be more valuable than invariable written material. A growing proportion of the population is learning to use the Internet and the World Wide Web, and this promises to become a useful educational medium for patients with many medical disorders. However, comparatively few individuals now have access to the Internet, and misinformation is mixed with good information. Although written materials are difficult for some, almost everyone knows how to use a telephone, and computer-based interactive educational programs are currently most accessible in the IVR medium. Content can also be controlled in IVR programs. When continuing medical education updates are made in computer education programs on networks or accessible by IVR, they are immediately available to all users. Programs installed on personal computers remain static unless updates are made on each machine.

TREATMENT

After screening has helped individuals recognize that they may be ill and diagnosis has confirmed their depression, treatment can begin. Educational materials are provided, and monitoring is done to guide treatment. Because comparatively few patients have access to qualified psychotherapists and because some psychotherapies for depression have been rather fully described in training manuals, attempts have been made to develop computer programs that could guide patients in self-help treatment of their depression. Most of these programs employ some form of cognitive-behavioral therapy. Selmi[8] developed and evaluated a 6-session cognitive-behavioral therapy program for treatment of mild-to-moderate depression. Selmi randomly assigned 36 patients to desktop computer–administered cognitive-behavioral therapy, clinician-administered cognitive-behavioral therapy, or a treatment-on-demand waiting list. Patients treated by computer and clinician improved significantly over the 6 weeks of acute treatment and their gains increased further at 2-month fol-

Figure 1. Between-Group Comparison of Scores on the Computer-Administered Hamilton Rating Scale for Depression (HAM-D)*



*Adapted from reference 8.

Table 1. COPE Booklets

Starter Kit
Assertive Communication
Constructive Thinking
Pleasant Activities
Grieving
Down With Gloom
Maintaining Your Gains

Table 2. Eleven COPE IVR Telephone Calls*

Welcome
Getting Started
Assertive Communication
Constructive Thinking (3)
Pleasant Activities (4)
Maintaining Gains

*Abbreviation: IVR = interactive voice response.

Table 3. COPE Phase II Trial Baseline Characteristics (N = 41)*

	Site		
Variable	Boston (N = 12)	Madison (N = 15)	London (N = 14)
Gender, M:F	1:2	1:2	1:2.5
Mean age (y)	42.1	45.6	35.4
% with dysthymia	27	7	50
Mean HAM-D score (6-item subset)[a]	16.3	18.8	21.2
Mean work and social adjustment scale score	17.3	17.4	22.1

*Abbreviation: HAM-D = Hamilton Rating Scale for Depression.
[a]See reference 18.

low-up. Patients in the waiting list control group improved significantly less during the acute treatment and returned to their baseline level of depression at 2-month follow-up (Figure 1).

Gould developed the Therapeutic Learning Program (TLP), which combines computer interactions with group therapy sessions.[9] Open evaluations are positive in terms of patient satisfaction, but the program awaits rigorous evaluation after more than a decade of use. Colby[10] developed Overcoming Depression, a cognitive-behavioral therapy program for desktop computer that makes interpretations based on responses patients type to questions the computer asks. Interestingly, a random assignment trial comparing Colby's program with Selmi's found Selmi's more effective,[11] and another trial found human therapy more effective than Colby's program.[12]

COPE is an IVR self-care program for mild to moderate depression. The COPE program includes a videotape that describes depression and its treatment with medications, psychotherapy, and electroconvulsive therapy. The COPE program combines 7 self-help programmed booklets (Table 1) with 11 IVR telephone calls (Table 2). Gould and Clum[13] have demonstrated that therapeutic effect size more than doubles when 2 media of communication are employed in self-help programs. In addition to booklets, COPE uses IVR calls to guide the patient through 3 treatments. Constructive thinking,[14] assertive communication,[15] and pleasant activities[16] have each been shown to be effective treatments of depression. It is probable that some patients will do better with one psychotherapy than another, just as some patients respond better to one antidepressant medication than another. Six triage questions guide patients to the treatment thought most likely to be helpful, but patients are free to choose whichever treatment approach they prefer.

Our research group conducted an open study[17] of patients (N = 41) with mild-to-moderate depression living in or near Boston, Massachusetts; Madison, Wisconsin; and London, England. Patients were screened by a clinician to confirm the diagnosis of depression and that the patients met all entry criteria. Baseline characteristics are presented in Table 3. The COPE program assessed each patient's status on the Work and Social Adjustment Scale,[19] the Clinical Global Impressions-Improvement (CGI-I) scale,[20] and a subset of items from the Hamilton Rating Scale for Depression (HAM-D).[21] Patients received immediate feedback based on their responses to the present and previous assessments and results of their assessments were also sent to the study coordinators. Antidepressant response was defined as a 50% or greater reduction in the HAM-D score and/or a CGI-I score of 1 (very much improved) or 2 (much improved). Patients were enrolled, and they made a total of 471 calls with a mean call length of 10.7 minutes. Sixty-eight percent of the calls occurred outside of the time period from 9:00 a.m. to 5:00 p.m. Monday through Friday, and patients commented on the convenience of being able to call the computer at any time. There was a strong correlation between the number of calls made and the amount of improvement obtained on the CGI-I ($r = -.56$, $df = 37$, $p < .001$). Seventy-two percent of those who made 10 or more calls had 50% or greater reductions from their base-

Table 4. Percentage of COPE Responders*

Location	HAM-D Score ≤ 50% of Baseline, %	CGI-I Score = 1 or 2, %
US (N = 26)	67	64
UK (N = 14)	14	21
US + UK (N = 40)	49	46

*Abbreviation: CGI-I = Clinical Global Impressions-Improvement scale.

line HAM-D scores. Only 30% of those who made fewer than 10 calls achieved that outcome.

Overall, 49% of patients were responders using the HAM-D response criterion, and 46% of patients were CGI-I responders. Patients in the United States improved significantly more than patients in the United Kingdom (Table 4). There was also a large and statistically significant improvement ($p < .001$) on the Work and Social Adjustment Scale.

After a patient had completed the "Getting Started" call, a single question ("How logical does this type of treatment seem to you?") proved remarkably helpful in identifying treatment responders. Eighty percent (12/15) of patients who thought COPE was "very logical" and 40% (8/20) of those who said COPE was "moderately logical" were responders. None of the 5 patients who indicated that COPE seemed "okay," "not that logical," or "not at all logical" were responders.

Booklets were written at a seventh-grade reading level, and 78% of patients found the booklets "very easy" to follow and use, with an additional 18% finding them "easy" to use. Sixty-seven percent described the booklets as "very useful" in learning new skills to manage depression, and 18% reported them "somewhat useful."

Because the interactive voice response component of the program was unusual, we assessed patients' reactions to the phone system. Seventy percent reported they were "very comfortable" and 22% "somewhat comfortable" with the phone system. Sixty-two percent said it was "very easy" to answer questions using the phone system, and 31% said "easy." With regard to expressing their feelings, 44% said they could express their feelings "very well" and 37% said "well."

Who might benefit from using an effective computer therapy program for depression? Based on results of the Selmi[8] and COPE programs, computer therapies may help those with mild-to-moderate depression and, for COPE, those who see it as a logical treatment for their depression. Those wanting to avoid medications (e.g., women who are pregnant or breastfeeding, individuals who are antidepressant intolerant, unresponsive, or unwilling to take or unable to afford medication) and individuals who do not want their insurer to know they have been depressed or are receiving treatment for depression, who have no access to a clinician or are awaiting therapy, who want a combination of medication and psychotherapy, or who cannot commute to a psychotherapist may be appropriate candidates for treatment with these programs.

Computer interviews have advantages and limitations. They can be widely available and, in IVR format, are accessible at all hours from any Touch-Tone telephone. Computer interviews are consistent. They provide exactly the same information to each user assuming the same responses at branching points in the interview. Obvious response errors can be identified at the time they are made (inconsistencies in response or impossible/improbable responses [e.g., age greater than 100 years]) so that the respondent may correct them before proceeding. Data are stored in computer-processible form and are used for subsequent program branching, to generate reports for clinicians, and to permit analyses of composite data on many patients.

The computer might be thought to be inflexible, but each patient can have a highly individualized progression through a computer interview when that is appropriate. Programs can be designed to be reliably inflexible in assessment but to facilitate tailoring of program elements in therapy programs. An example is the patient choice of which treatment component to use in COPE. Further, COPE patients record their unique responses to questions in their own voices. These voice files are replayed at appropriate points in the program, and patients modify them as they change their perspectives over time. Humans are educable and, in a sense, so are computer programs. There is a uniformity of computer updates that ensures each subsequent program user an identical experience of the updated program. Clinicians learn at different rates, and patients who visit different doctors receive different qualities of care. Computer interviews are generally unresponsive to nonverbal cues, although they can easily be programmed to branch contingent on response latency. For example, if a patient does not respond to a question within a few seconds, the COPE program says, "Let me repeat that for you." Finally, computers do not form affective relationships with patients or transgress sexual boundaries, although some patients form quasi-affective relationships with computer interview programs.

CONCLUSIONS

Computer interviews complement, supplement, and reinforce clinician functioning in important clinical roles. Screening and diagnosis programs help the clinician with initial assessments pivotal in recognizing and diagnosing disorders. Ongoing computer assessments of severity and change are helpful in monitoring treatment response and determining outcomes. The role of computer programs in providing educational information to individuals with depression (and to their families and friends) has not been well developed. Self-care treatment programs that employ cognitive-behavioral therapy and other self-help ap-

proaches permit some depressed individuals to overcome mild-to-moderate depression without direct therapist intervention.

Clinicians need computers to enhance the quality of their practices. Computers can help us reverse the perceived erosion in the quality of the care we are able to provide in managed care settings. Even without the impetus of managed care constraints, our profession's quest for better understanding and management of depression would have led to the development and use of computer interviews. There are some things we simply cannot do in clinical practice without computer interviews.

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