

Teaching Medication Management Skills to Schizophrenic Patients

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A behaviorally-oriented program for teaching medication management skills to psychiatrically disabled patients was field-tested in a broad range of inpatient and partial-hospitalization clinics representing a wide geographic distribution across the United States. Results indicated that medical practitioners and others in the allied health professions were able to implement the medication management program with a high degree of fidelity. Additionally, patients who participated in the study demonstrated significant gains in cognitive mastery of the program content, high levels of skill attainment, increased utilization of medication management skills, and a significant increase in medication compliance.
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INSUFFICIENT understanding of the potential therapeutic benefits and side effects of neuroleptic medications and the failure to adhere to prescribed drug regimens are major contributors to relapse and rehospitalization of individuals with chronic schizophrenic disorders.¹⁻³ Prominent among the reasons for drug noncompliance in schizophrenia are dysphoric and extrapyramidal side effects, cognitive impairments, complexity of the drug regimen, and failure of psychiatrists and other health care providers to educate patients about the benefits of prophylactic, long-term maintenance medication. Appropriate expectations about medication effects, proper self-administration techniques, and compliance behaviors and attitudes must be learned, but few programs exist for the systematic teaching of medication self-management skills.

Several strategies for educating patients and improving compliance with neuroleptics have been described, most often utilizing behavioral learning principles.⁴⁻⁷

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Highly structured training programs have been found to be more effective than didactic educational formats. Moreover, behavior-oriented rehabilitation modalities such as social skills training, training in community living; and family management have markedly reduced relapse and rehospitalization rates when combined with judicious doses of neuroleptics.⁸⁻¹⁰ To overcome the learning disabilities of schizophrenic patients and to make more readily available a medication education program for all levels of mental health practitioners, the Medication Management Module was designed at the Rehabilitation Service of the Brentwood Veterans Administration Medical Center and the UCLA Clinical Research Center for Schizophrenia and Psychiatric Rehabilitation. The module consists of a Trainer's Manual, a Patient's Workbook, and a Demonstration Video that is used to model appropriate medication self-management skills.

Training in medication self-management comprises four skill areas: (1) obtaining information about the benefits of antipsychotic medication; (2) knowing correct self-administration and evaluation of medication; (3) identifying side effects of medication; and (4) negotiating medication issues with health-care providers. The module, which is described in detail elsewhere,^{11, 12} employs systematic learning principles such as specific educational objectives, goal setting, redundancy of information and overlearning, use of multimedia instructional techniques, clarity of instructions, checking for assimilation of material presented, modeling, use of positive reinforcement and shaping techniques, role playing or behavioral rehearsal, coaching and active prompting of correct responses, and immediate positive or corrective feedback. Homework assignments and *in vivo* exercises promote the transfer or application of the skills trained in the sessions to the patient's natural environment.

Previous research documented the success of the module in promoting acquisition of the targeted skills by schizophrenics at the Rehabilitation Service of the UCLA-affiliated Brentwood Veterans Administration Hospital

and in a controlled study at Camarillo State Hospital.^{11, 14} However, from a practical standpoint, a question remained as to whether the module could be implemented in typical clinical settings throughout the United States with fidelity and effectiveness. The current investigation was aimed at field-testing the utility and efficacy of the module in a broad array of inpatient and outpatient psychiatric facilities in the hands of mental health practitioners who were naive to the module procedures.

The field-test was designed to yield information regarding user friendliness, trainers' competence, and impact on patients' knowledge of, attitudes toward, and use of antipsychotic drugs. Additionally, questions related to the amount of training required to attain adequate levels of trainer competence were answered.

Method

The study was organized into two phases. In the first phase, field-test sites were recruited, and selected clinicians were trained to conduct the Medication Management Module. In the second phase, clinicians at each field-test site implemented the module with a cohort of patients and data were collected.

Twenty-eight field-test sites were assigned to one of two conditions: training plus consultation versus consultation alone. As desirable as random assignment to conditions might have been, it was not feasible. To make the assignment, clinical directors at prospective field-test sites were contacted by telephone. The nature of the study and the criteria for participation were described, followed by a detailed written description of the study protocol and a letter of agreement listing the respective responsibilities of the project staff and the staff of participating field-test sites. In essence, the sites' staffs agreed to allocate the resources necessary to conduct the Medication Management Module (i.e., two mental health specialists to serve as a module training team, video equipment and space to conduct the group for the duration of the module—approximately 3 hours/week for 4 months) in exchange for all module training materials, consultation, and, for half of the sites, training of the two clinicians who comprised the module training team. The first 14 sites to obtain funding to cover the costs (transportation, meals, and lodging) of sending two clinicians to Los Angeles for a 2-day training institute were assigned to the training plus consultation condition. The remaining 14 centers' clinicians were assigned to the consultation alone condition.

The sites in both conditions represented a wide geographic distribution and a broad range of inpatient and partial-hospitalization programs located in public and private psychiatric hospitals, community mental health centers, and residential care facilities. Participating trainers

represented a range of disciplines including psychiatry, psychology, social work, nursing, occupational therapy, and mental health care. More than half of the trainers had education at the bachelor's level or less. Only 10% were at the doctoral level of training. The mean number of years of clinical experience was 9.5 and the mean number of years working with chronic patients was 6.5 years.

In the implementation phase of the study, a total of 160 patients—approximately six from each of the 28 field-test sites—were selected by the module trainers at the sites according to the following criteria: (1) candidate for long-term maintenance neuroleptic therapy; (2) between the ages of 18–60 years; (3) a history of at least two previous hospital admissions with a primary DSM-III diagnosis of schizophrenia; (4) no evidence of organic brain syndrome; (5) able to read and write English; (6) no significant impairment of hearing or vision.

Patients who participated in the study were relatively young, with a mean age slightly less than 32 years. They averaged more than five previous hospitalizations. Fifty-seven percent of the patients in the study were men. One in four of the patients who participated in the field test resided in a psychiatric hospital as an inpatient, while 17% were living alone. The remainder were divided relatively evenly among family, board-and-care homes, or other community-based residential treatment facilities.

Training procedures

Clinicians participating in the training plus consultation condition received a 2-day course of instruction designed to achieve a specified criterion of competence. In this condition, the clinicians first attended a presentation that oriented them to the skill-training approach to treatment. Next, they were given an overview of the Medication Management Module's content and procedures. Trainees then observed a demonstration group in which expert therapists conducted a 2-hour Medication Management session with volunteer patients who were enrolled in the Medication Self-Management Module at the Brentwood Veterans Administration Hospital. Each of the specific learning activities contained in the module was modeled for the clinician trainees. The remainder of the training consisted of structured practice exercises under the supervision and guidance of experienced module trainers and consultants. Rather than teaching specific content, the training taught the clinicians how to use the module. By the end of the 2-day training institute, all of the participants had the ability to perform the requisite module procedures.

Clinicians participating in the consultation alone condition received a detailed procedural guide for implementing the module. However, no direct training was provided. Over the phone, they were instructed to read the materials carefully, view the videotape, and work in

a "buddy system" with their cotrainer to role play the various instructional activities contained in the module. Expert consultation was available by telephone throughout the field test for all sites.

Measures

Module trainers. Trainer competency was measured in two ways. Knowledge of module content and procedures was measured by a 38-item, multiple-choice, paper-and-pencil test before and after training. The test had two subscales, one measuring the informational contents of the trainer's manual and the other related to the training procedures described in the manual. Ability to actually perform or implement procedures as specified in the trainer's manual was assessed by direct observation of clinicians conducting medication-management groups at half of the sites in each of the two training conditions. These data were collected with an instrument composed of seven scales measuring each of the specific instructional activities that comprise the module. Items on each of the scales were rated on an eight-point, Likert-type scale ranging from "did not occur" to "excellent." Before the data were collected, a rating of four on each scale was established as the minimum acceptable level of trainer competence. Interrater reliability on the fidelity scale exceeded 96%.

Patients. The impact of the Medication Management Module on patients was evaluated in three domains: knowledge of module content, acquisition and use of medication management skills, and compliance with drug regimen.

Knowledge of module content and skill attainment was assessed by a behavioral performance (role play) test administered by the trainers who conducted the group. In this assessment, patients participated in a structured role play exercise before module training and again at the conclusion of the module. Four "scenes" directly related to the module skill areas were evaluated. In conducting the assessment, the trainers engaged each patient, individually, in the role play test so that the patients could not model responses for one another. The trainers then rated the patients' performances for each scene on a four-point, Likert-type scale ranging from "poor" to "excellent." Each point on the scale was defined operationally, in behavioral terms. Interpersonal skills such as voice tone and body posture were considered only on those items related to skill areas in which those behaviors were specifically taught.

Skill utilization was assessed by the patients' psychiatrists before training, after training, and at a 3-month follow-up. Some of the psychiatrists knew that the patients were participating in a medical education program but all were blind to the specific nature and extent of the module content and procedures. At each assessment, the

psychiatrists completed a detailed questionnaire that elicited specific information about the patient's use of medication management skills taught during module training. Patients were rated on questions such as "Does the patient monitor his/her responses to antipsychotic medication on a form each day?" and "Does the patient bring his/her side effects checklist to medication reviews?" Each item was rated on a four-point scale ranging from "not at all" to "almost always."

Medication compliance was independently assessed by the patients' psychiatrists, health care personnel, and by a caregiver (family member, residential care home operator, or other responsible individual). In all cases, ratings were made on a four-point scale ranging from "always takes his/her medicine" to "never takes his/her medicine."

Results

Trainer competence

The results on both measures of trainer competency indicated that the module leaders did learn the skills training procedures contained in the Medication Management Module and delivered them with a high degree of fidelity. The module trainers at all 28 field test sites completed all phases of the study.

It was expected that experienced clinicians would be relatively familiar with the general content of the module without specific training; that is, that clinicians working with chronic mental patients would know about neuroleptic medications and issues related to medication management. This expectation was confirmed by the relatively high scores on the content subscale pretest (mean = 71%). At the same time, it was expected that participating clinicians would be relatively less familiar with the specific learning activities and procedures contained in the module. This was also confirmed by lower scores on the procedures subscale pretest (mean = 59%) and by a larger gain (22%) relative to the gain on the content subscale (15%). There were significant increases both in cognitive mastery of content ($t = 6.78; p < 0.0001$) and use of training procedures ($t = 7.16; p < 0.0001$).

One of the main questions asked of the Medication Management Module field test was whether clinicians with a diversity of experience and representing a range of disciplines could actually deliver the module with an acceptable degree of fidelity. Figure 1 depicts the results of the fidelity study that served as a measure of behavioral mastery of module content and procedures. Mean ratings on each of the seven scales indicated that those clinicians who came to Los Angeles for training were superior in their delivery of the module. However, it is equally clear that, even without structured training, therapists were able to follow the module procedures with a satisfactory degree of precision.

FIDELITY INDEX SCORES FOR MODULE LEARNING ACTIVITIES

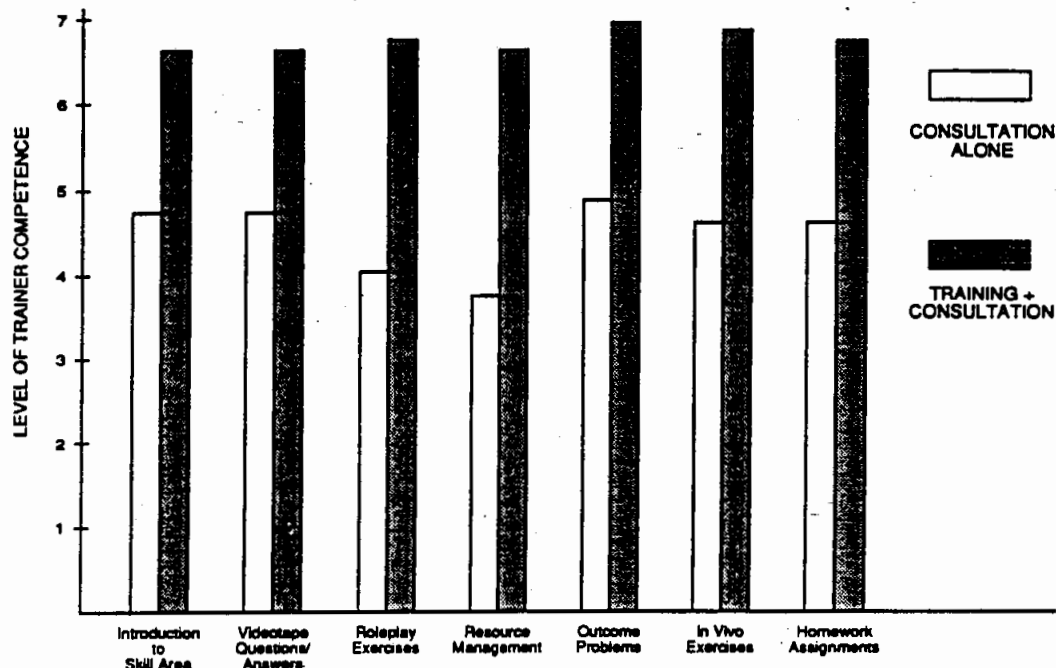


FIG. 1. Fidelity with which clinicians delivered the training in medication self-management to 160 schizophrenic patients. Fidelity was rated by observers using a reliable coding system. Differences between clinicians who received a 2-day training institute versus those who received the module in the mail did not influence patient outcome. A score of four was considered to be the minimum acceptable level of trainer competence.

Patient outcome

Of the 172 patients recruited to participate in the field-test, 160 completed the study. Patient attendance to the module training sessions was identical in both conditions (87%). While the duration of module training varied somewhat from site to site, the average number of training sessions did not differ across conditions. All sites adhered to the 3-hour/week training schedule called for by the study protocol. Training at the various sites was completed in 15–20 weeks.

A range of demographic variables were first examined to determine whether there were any important differences between patients participating in the training plus consultation and those in the consultation alone conditions. The data analysis revealed that there were no significant differences in age, sex, level of education, type of residence, number of psychiatric hospitalizations, or time since last hospitalization. Additionally, repeated-measure analyses of variance (ANOVAs) with one between-groups factor (training plus consultation and consultation alone) and one within-groups factor (time, measured at pretreatment and at posttreatment) were calculated for all measures of knowledge acquisition, skill attainment, and skill utilization. In these analyses, groups-by-time interactions tested the significance of differences between groups over time. No significant interactions

were found, indicating that patients in both conditions performed at about the same level whether or not the trainers conducting the groups received systematic training in module procedures beforehand.

Because there were no significant differences in demographic make-up and because training of the clinicians did not appreciably influence patient outcome, the two groups were combined and pre/post-differences were evaluated using *t*-tests for related groups (two-tailed) for score data and McNemar's χ^2 for nominal level measures.

There were significant gains in cognitive mastery, skill attainment, skill utilization, and medication compliance. Knowledge of topics covered in the Medication Management Module and the skills with which patients put their knowledge to use was assessed via a series of role play tests. It was expected that patients' initial scores on the test would be relatively high, owing to the fact that some effort is usually made to provide general information about neuroleptic medications even though most patients are not trained in specific medication management skills. This expectation was substantiated by pretreatment scores on the role play tests ranging between 42–56%.

Results from the behavior-performance tests of medication self-management skills are summarized in Table 1. Medication management skills increased significantly in each of the four skill areas. Thus, patients gave both

TABLE 1. Mean knowledge and skill attainment scores for each of the four skill areas of the module from schizophrenic patients who participated in the field trial of the Medication Management Module

Module Skills Areas	Pretraining	Posttraining	t	p
Obtaining information about antipsychotic medication	52	80	6.66	0.0001
Administration of medication and evaluation of its benefits	56	84	6.48	0.0001
Identifying medication side effects	42	71	6.55	0.0001
Negotiating medication issues with health care providers	50	70	5.23	0.0001

cognitive and behavioral evidence that they had learned the skills taught during module training. On average, knowledge about neuroleptics and use of medication management skills increased approximately 50% across the four domains assessed.

According to the psychiatrists' ratings, the mean percentage of skill utilization increased significantly from 40% before training to 56% following training ($t = 6.68$, $p < 0.0001$). Ratings at 3-month follow-up (mean = 58%) indicated that patients continued to use the skills they were taught during module training.

Medication compliance was assessed independently by the patients' psychiatrists and by a designated caregiver. Reports obtained from the patients' psychiatrists indicated that medication compliance increased from 67% before training to 82% after training (McNemar's $\chi^2 = 4.26$, $p = 0.04$). Compliance reports from the patients' caregivers paralleled those of the psychiatrists. According to their reports, compliance increased from 60% before training to 79% after training (McNemar's $\chi^2 = 7.14$, $p = 0.01$).

Discussion

These findings suggest that a broad range of medical practitioners and others in the allied health professions found the module materials and training procedures relatively easy to use and effective with their patients. The prescriptive nature of the Trainer's Manual combined with the availability of expert consultation made it possible for users to faithfully implement the module procedures without the benefit of extensive training.

It is understood that this study was not a randomized control, and interpretations must be made in this light. The possible biasing effects of the inherent self-selection on the training condition are difficult to determine. On one hand, it might be expected that sites that paid the expenses for travel to Los Angeles for training may have been more motivated or had more resources that could predispose to better results. On the other hand, it is possible that the motivation to make the investment was related to a desire to overcome difficulties in treating the

particular populations served by those sites. Mindful of the possible confounding effects of intersite variables, we collected data on a variety of characteristics as an aid for interpreting any differences in outcome that might have occurred. However, there were no significant between-group differences on any of the clinician or patient variables assessed.

Although this was not a randomized trial, we were interested to see whether there was any obvious advantage to the on-site training over simply furnishing materials for self-teaching. Clinicians who received training were somewhat more polished in their delivery of the module but this was not associated with correspondingly better outcomes in patients' knowledge or skill. This finding is important because it indicates that the module materials are "user friendly"—the materials are sufficiently detailed to enable them to stand alone. These findings imply that the guidance and highly prescribed use of learning principles inherent in the Trainer's Manual were apparently prepotent over other training elements.

The results of this study suggest that the Medication Management Module can be used effectively by practitioners who have relatively little professional training and limited experience—common among those in direct service positions with the chronically mentally ill. The fact that the first 28 facilities contacted agreed to serve as field-test sites, regardless of condition, is a testimony to the widespread desirability of systematic treatment programs for patients who have chronic mental illness. Measures of consumer satisfaction among trainers and patients were uniformly high. All 28 of the participating field test sites adapted the module training procedures to their clinic populations and integrated the Medication Management Module into their programs. At the conclusion of the study all of the field test sites recruited new cohorts of patients and were continuing to use the module. Eight of the sites had trained additional clinicians to conduct the module within 3 months of the conclusion of the study.

Most important are the results that focus on the impact of Medication Module training on patients. Results showed significant gains in cognitive mastery of information contained in the module and a relatively high level of skill attainment among patients. Results on all measures of medication compliance showed substantial gains in adherence to medication regimens. These results are encouraging, particularly in light of the fact that there was no significant erosion of the skills taught over the first 3 months following training. The critical test, however, will come in the longitudinal follow-ups scheduled at 6 months and 1 year, which will determine whether these gains are maintained without further training.

In the absence of a no-treatment or placebo/attention control, one might speculate that the gains demonstrated

by patients participating in the field-test were due to a "halo effect" or intent to please the clinicians. However, controlled studies of the module have not found posttest improvements in patients enrolled in contrast therapies that might also be construed as carrying placebo effects.¹⁴ Moreover, the results obtained in this field-test compare favorably with those found in a carefully controlled trial of the module using similar dependent measures.¹³ In this study, the investigators compared 34 chronically mentally ill inpatients assigned randomly to module training or with a waiting-list control group. Patients trained with the module demonstrated a threefold increase in medication management knowledge and skills, while the control group showed no change over the same time period. In a systematic replication, the same investigators obtained similar results with 11 chronically mentally ill individuals living in a residential care home.¹³

Based on the evaluation of this module, further module development in other areas of independent living promises to be a useful technology for teaching schizophrenic patients skills that are widely relevant to community adaptation.

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