

Effectiveness and Replicability of Modules for Teaching Social and Instrumental Skills to the Severely Mentally Ill

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***Objective:** This study evaluated the effectiveness and replicability of psychoeducational modules designed to improve the social and instrumental competencies of severely mentally ill patients. **Method:** Staff in seven facilities used the modules to teach 108 severely mentally ill patients. Staff received 2 days of formal training followed by periodic consultation. Each module's effectiveness was measured by a test of the patients' knowledge and performance of the skills taught in that module. Staff's adherence to the instructional techniques specified in the modules was measured by directly observing them and assessing the fidelity of their behaviors to those specified in the modules. **Results:** The patients' skills significantly improved and were maintained during a 1-year follow-up, and staff accurately followed the modules with minimal consultation. **Conclusions:** These training modules are effective and replicable techniques for teaching social and instrumental skills to severely mentally ill patients. The modules can be easily disseminated to a variety of facilities and used as components in a comprehensive rehabilitation program.*

(Am J Psychiatry 1992; 149:654-658)

Although neuroleptic medication is the treatment of choice for reducing the positive symptoms of chronic schizophrenia, it does little to ameliorate the anhedonia and impoverished social and instrumental role functioning associated with the disorder's negative symptoms (1, 2). Several comprehensive model psychosocial treatment programs that complement pharmacotherapy by improving social and instrumental role functioning have resulted in reduced rates of relapse and rehospitalization (3-5). Unlike medication, however, they have not been widely adopted by the general systems of mental health care. The programs have been difficult to disseminate because of their comprehensiveness; their use of unique settings, staff, patients, and resources; and their poorly operationalized techniques (6, 7).

Less comprehensive psychosocial treatment programs focusing on improving patients' interpersonal skills have been developed. These programs have also reduced rates of relapse and rehospitalization (8-11), but they too have had little impact on the general systems of mental health care. Their treatment techniques

have been poorly documented, and their narrow focus on social or family skills has not satisfied the desire for improved role performance and quality of life for patients, their significant others, and clinicians.

However, a set of psychoeducational modules have been developed with the objectives of 1) teaching patients social and instrumental competencies in key domains of community functioning and 2) being easily and accurately used by staff in general systems of mental health care. The domains include self-management of neuroleptic medication, coping with schizophrenic symptoms, grooming/personal hygiene, participating in recreational activities, and engaging in friendly conversations. These domains were chosen because competency in them has been associated with longer community tenure (12-14) and is hypothesized to be associated with less risk for symptomatic relapse according to the "stress-vulnerability" theory of schizophrenia (15).

All modules use the same highly structured and thoroughly specified instructional techniques so that staff can easily and accurately use them with a minimum of training and ongoing consultation. The techniques also compensate for patients' cognitive dysfunctions, and each module is a small, self-contained package that can be inexpensively tried and then either rejected or adopted, either alone or in combination with other modules, as the base of a comprehensive rehabilitation program (16, 17).

The purpose of the present research was to confirm that the modules fulfilled their design objectives. If they did, staff would have a set of techniques that they could use to improve the long-term outcomes of their men-

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Supported by NIMH grant MH-30911, California Department of Mental Health Research contract 90-79054, and a grant from McNeil Pharmaceutical.

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rally disordered patients by enhancing their community functioning.

METHOD

Modules

Each module is a self-contained curriculum that teaches from four to six competencies in a major domain of community functioning. For example, the medication management module teaches five competencies: recognizing medication's benefits, recognizing its side effects, monitoring these side effects, discussing medication with physicians and other caregivers, and recognizing the benefits of injectable medication. Each competency is divided into the specific skills that define the competency and are the focus of the training. For example, competently discussing medication with physicians and other caregivers is divided into pleasantly greeting the physician, describing the problem in detail (including its duration and severity), requesting that action be taken, clarifying and repeating the doctor's prescription, and pleasantly ending the interaction while maintaining appropriate eye contact, posture, and paralinguistic qualities during the entire exchange.

Each competency's constituent skills are taught with the same seven instructional techniques. The first three—introduction, videotape demonstration, role-playing practice—help patients learn and practice the skills in the training sessions. The fourth and fifth techniques—solving resource management problems and solving outcome problems—prepare participants to use their skills outside of the training sessions. The sixth and seventh activities—in vivo exercises and homework assignments—require that participants use the skills outside of the training session. A detailed description of the modules is given elsewhere (16).

Each module consists of a trainer's manual, participant's workbook, and demonstration videotape. The manual specifies exactly what the trainer is to say and do to teach all of the module's skills; the videotape demonstrates the skills; and the workbook provides participants with written material, forms, and exercises that help them learn the skills. The trainer instructs by reading scripts and asking questions written in the manual, by playing the videotape, and by evaluating the participants' role playing with checklists written in the manual. The trainer corrects inaccurate answers or role playing by using prompting, modeling, coaching, and reinforcement. A training session is generally conducted with four to eight patients and one trainer, and sessions are scheduled two or three times per week for 1 to 1-1/2 hours each. Approximately 13 to 20 weeks of twice-weekly sessions are needed to complete each module.

Facilities, Staff, and Patients

Three modules—medication management, recreation, and grooming—were implemented in seven treatment

facilities: a long-term rehabilitation program located in a state hospital that treated approximately 200 individuals; five residential care facilities that provided housing for 6, 12, 24, 50, and 60 individuals, respectively; and a day treatment program that treated approximately 35 individuals. The training was conducted by nursing staff in the inpatient program, by the owners/operators of the three smaller residential care facilities, and by recreation therapists and mental health counselors at the two larger residential care facilities and the day treatment program. The trainers' educational and clinical backgrounds ranged from completion of high school to graduation from professional master's degree programs, and from 1 month to 10 years of experience in treating severely mentally ill individuals.

Staff attended a 2-day workshop in which the rationale for each instructional activity was explained and the specific procedures were demonstrated. At the end of the workshop, staff chose the module or modules they would teach, selected the patients, and established a schedule of consultation visits by two experienced research assistants, who had also conducted the workshop.

A total of 126 severely mentally ill patients agreed to participate in training with at least one module; 108 completed the training. The 18 noncompleters were inpatients who were discharged or transferred before the end of training. All 126 had been judged to be deficient in a module's skills and able to participate in the group training sessions. Selection and recruitment were conducted by the facilities' staffs. Approximately 91% of the patients (115 of the 126 recruited and 98 of the 108 completers) had been diagnosed as having a schizophrenic or schizoaffective disorder according to *DSM-III-R* criteria, and most had been hospitalized continuously or episodically for the past several years. The average age of the 108 completers was 33 years ($SD=10$), 82 were male, and 81 were Caucasian, nine were black, and 18 were Hispanic.

Measures

Each module's effectiveness in producing its learning objectives was measured by a test that consisted of specific questions and role-playing situations selected from each competency area of the module. The tests were administered by a trained interviewer, who recorded the patients' answers verbatim, classified them as correct or incorrect, and calculated total scores for each competency and for the entire module.

The trainers' competency in teaching was measured by directly observing them and determining the fidelity of their behaviors to those specified in each module's manual. For example, the trainers were observed while conducting a role-playing exercise to determine if they had read the appropriate section from the manual, correctly used the checklist to evaluate each participant's role playing, correctly conducted a group review of the role playing, provided positive feedback, and suggested improvements and conducted a second role-playing exercise if needed. The ratio of performed to specified be-

TABLE 1. Accuracy and Effectiveness of Module-Based Training in Social and Instrumental Skills for Severely Mentally Ill Patients

Site and Skill	Patient Group ^a	N	Percent of Trainer Behaviors That Matched Those Specified in Module Manual	Patients' Score			
				Pretraining		Posttraining	
				Mean	SD	Mean	SD
State hospital							
Medication management	Experimental	7	95	10.29	5.12	26.00	6.43
	Control	8	—	7.13	4.29	11.38	4.96
Grooming	Experimental	12	96	9.92	5.82	15.75	6.92
	Control	4	—	7.77	8.34	11.00	7.53
Day treatment program							
Medication management		6	92	14.80	3.88	28.00	1.79
Residential care facilities							
Site 1							
Recreation	Experimental	5	83	7.30	3.44	12.57	3.01
	Control	7	—	8.40	3.62	10.60	1.51
Grooming	Experimental	6	71	12.57	3.01	22.00	4.90
	Control	7	—	12.57	4.86	14.29	7.15
Site 2							
Medication management	Experimental	7	85	13.86	6.59	25.14	6.52
	Control	5	—	14.20	6.64	15.00	6.82
Site 3							
Medication management		7	98	14.14	5.58	23.29	5.62
Recreation		9	70	14.44	5.66	23.44	5.38
Site 4							
Medication management		5	15	14.80	5.32	14.80	4.96
Site 5							
Medication management		3	73	10.33	3.52	17.00	10.15
Grooming		6	71	13.00	4.15	18.00	3.03

^aFor the programs with relatively few patients, a one-group, pre/post study design was used.

haviors was calculated for each instructional activity, and the results were averaged across all activities to obtain a percentage for each module and facility.

The same research assistants who conducted the staff workshop also administered the tests of accuracy and effectiveness. The tests of effectiveness were administered before the instruction, immediately afterward, and, for the patients remaining at each facility, 1 year later.

In the state hospital program and the two larger residential care facilities a two-group, random-assignment, experimental research design was used; the control group patients were placed on a waiting list. The three smaller residential facilities and the day care program treated relatively few patients, and there a one-group, pre/post, nonexperimental research design was used.

Reliability

Test-retest reliability for each module's measure of effectiveness was determined by calculating a Pearson r for the correlation between the two testings of the control groups at the facilities that used an experimental design. The correlations were 0.87 for the medication management module, 0.64 for the grooming module, and 0.73 for the recreation module.

Interrater reliability for each effectiveness measure was determined by calculating the intraclass correlation coefficient (ICC 2,1 [18, 19]) for the relationship between one research assistant's scoring of the participants' recorded verbatim answers and the scoring of the research assistant who initially administered and scored the test. All information identifying either the patient or the date of the

testing was removed from the records of the verbatim answers. The intraclass correlations were 0.94 for the test of the medication management module ($N=14$), 0.97 for the test of the grooming module ($N=20$), and 0.95 for the test of the recreation module ($N=10$).

Several posttraining answers, however, were recitations of the material, which could have informed the second scorer of the date of testing. Hence, the efficacy tests were administered to 10 patients with schizophrenia who were not included in the study, and their performances were videotaped. The tapes were independently scored by the two research assistants, and the intraclass correlations between their scores were 0.92 for the medication management module, 0.97 for the grooming module, and 0.94 for the recreation module.

Interrater reliability of the accuracy measure was determined by calculating the agreement between the two research assistants' independent assessments of 17 training sessions representing all facilities and trainers. The kappa was 0.88.

RESULTS

Short-Term Effectiveness

Table 1 lists the patients' pre- and posttraining scores for each module and each facility and the percentage of the trainers' behaviors that matched those specified in the modules' manuals averaged across the observations at each facility.

The posttraining scores for the facilities that used an

experimental research design were analyzed separately for each module by using a two-way (group, site) factorial analysis of covariance (ANCOVA) for the medication and grooming modules and a one-way (group) ANCOVA for the recreation module with the pretraining scores as the covariate. The results indicated significant differences between the experimental and control groups for each module (medication management: $F=26.68$, $df=1, 22$, $p<0.0001$; grooming: $F=7.99$, $df=1, 24$, $p=0.009$; recreation: $F=5.51$, $df=1, 8$, $p=0.05$). There was no significant difference among the sites (medication: $F=0.10$, $df=1, 22$, $p=0.76$; grooming: $F=0.50$, $df=1, 24$, $p=0.49$) and no significant Site by Group interaction (medication: $F=0.44$, $df=1, 22$, $p=0.51$; grooming: $F=1.71$, $df=1, 24$, $p=0.20$).

To further analyze the effects of training, for each module a partial correlation between the posttraining scores and group was calculated, with partialing of the pretraining scores from both variables. Site was not considered in this analysis since it was not significant either as a main effect or in interaction with group in either the medication or grooming ANCOVA. The results were partial correlations of 0.74 for the medication module, 0.46 for the grooming module, and 0.64 for the recreation module.

To analyze the replicability of each module's effects across treatment facilities, pre/post scores were analyzed with a two-way (site, pre/post) split-plot factorial analysis of variance (ANOVA), one per module. The results indicated that all sources of variance were significant for the medication module: pre/post ($F=48.21$, $df=1, 29$, $p<0.0001$), site ($F=2.60$, $df=5, 29$, $p=0.05$), and the Site by Pre/Post interaction ($F=2.91$, $df=5, 29$, $p=0.03$). The significant interaction was further analyzed with tests of simple main effects; the results indicated that the pre/post differences were significant for all sites except one residential care facility. The posttraining differences among the sites were further analyzed with a one-way ANCOVA using the pretraining scores as the covariate; the differences were significant ($F=3.97$, $df=5, 28$, $p=0.008$). Further analysis using Tukey's honestly significant difference test (corrected for unequal numbers of subjects) indicated that the posttraining scores for two residential care facilities were significantly lower than those for the other sites.

The results of the split-plot factorial ANOVA for the grooming module indicated a significant pre/post main effect ($F=106.2$, $df=1, 21$, $p<0.0001$) and a nonsignificant site main effect ($F=1.66$, $df=2, 29$, $p=0.21$) and Site by Pre/Post interaction ($F=3.32$, $df=2, 29$, $p=0.06$). The results of the split-plot factorial ANOVA for the recreation module indicated a significant pre/post main effect ($F=53.03$, $df=1, 17$, $p<0.0001$), a significant main effect of site ($F=11.24$, $df=2, 17$, $p=0.0008$), and a nonsignificant Site by Pre/Post interaction ($F=2.85$, $df=2, 17$, $p=0.09$). Further analysis using Tukey's honestly significant difference test (corrected for unequal numbers of subjects) indicated that the scores at one residential care facility were significantly higher overall than at the other sites. This was confirmed by a one-way ANCOVA of the differences among the sites using the pretraining scores as the covari-

ate; the main effect of site was significant ($F=4.48$, $df=2, 16$, $p=0.03$) because the scores at one residential care facility were higher than the scores at the other two sites.

Long-Term Effectiveness

The participants who remained at the facilities 1 year later and to whom the follow-up tests were administered ($N=35$) did not differ significantly in age, sex, ethnicity, or hospitalization from the complete set of participants. The data were analyzed with a one-way ANOVA for repeated measures, followed by a Tukey's honestly significant difference test for significant main effects. The results indicated that for all three modules there were significant improvements from pre- to post-training that had not declined at the follow-up testing.

Accuracy of Instruction

As indicated in table 1, except for the residential care facility that did not achieve a learning effect, the trainers' behaviors substantially matched those specified in the manuals.

DISCUSSION

The results confirm that the modules fulfilled their design objectives; with only a modicum of training and ongoing consultation, staff from diverse clinical and educational backgrounds working in diverse treatment facilities accurately taught the modules and achieved significant increases in the patients' knowledge and performance of the skills targeted by the training. This study replicates and considerably extends—with a more rigorous design and more modules—the previously reported findings on the modules in a national field test of 28 mental health facilities (20). Not only did the modules achieve their effects in both studies within the constraints of typical facilities that treat severely mentally ill patients, but the confirmation of the modules' effects in this study was achieved with both non-experimental and experimental research designs, the latter of which showed significant effects with the medication and grooming modules in two facilities.

The results with the experimental design indicated that the size of the modules' effects ranged from moderate to substantial; the percentages of shared common variance between the posttraining scores and the group variable after partialing the pretraining scores were 54.9% for the medication module, 40.8% for the recreation module, and 21.3% for the grooming module. These immediate effects were not restricted to the more functional patients; although the more dysfunctional and regressed inpatients had lower pre- and posttraining scores, their changes were not significantly different from those of the other patients. Furthermore, these effects were maintained over a 1-year follow-up, which is noteworthy given that functioning deficits tend to endure in spite of improvements in symptoms (21).

The results, however, point to the limitations of the modules. In spite of the modules' robust effects, they certainly did not produce a perfect learning outcome for every patient who participated in the training. Unfortunately, to fulfill the research objectives of this study, the training was conducted for standardized durations at all sites regardless of the patients' performance. A clinically more satisfactory approach may be to conduct the instruction for each module on a "mastery" basis, i.e., conduct training until each patient achieves 100% correct. However, given the relatively poor posttraining scores of the inpatients in particular—despite their having achieved substantial learning—mastery training might require extensive and time-consuming repetitions of a module. Perhaps this is to be expected given the chronic nature of the patients' illnesses and the many years that have elapsed since most were exposed to learning in a classroom environment.

The results from one residential facility also indicate that extensive deviations from the specified procedures can be deleterious. The facility's trainer eliminated several learning activities and changed the content and order of the remaining ones. Not surprisingly, the participants' knowledge and performance of the module's skills did not improve.

The results did not address the effects of the modules on global clinical outcomes, such as relapse and rehospitalization. Since the modules are specifically designed as encapsulated units whose content, form, and size allow each to be easily adapted to the structure of diverse treatment settings, they are not meant as a comprehensive system of care that will change global clinical outcomes. Rather, since each addresses a major domain of social and instrumental functioning, the set of them can form the cornerstone of a comprehensive system of care that encompasses the pharmacotherapy, vocational, family, case management, and individual services needed to rehabilitate persons with long-term mental illness. Controlled clinical evaluations of the set of modules, embedded in a comprehensive system of care, are currently underway (22).

The national plans for schizophrenia and services research (23, 24) include a recommendation for design of skill-building treatments that are relevant to the real world of clinical programs and produce durable improvements in functioning and independence. As Lehman (25) noted in a description of the current and contemplated changes in the political and funding arrangements for services to severely mentally ill patients, new arrangements will be successful only if they include effective treatments that are operationalized by skilled and motivated clinicians. The results of this study indicate that the modules are easily used, effective, and highly focused services that clinicians can profitably add to their armamentarium of clinical tactics.

REFERENCES

1. Goldstrom ID, Manderscheid RW: The chronic mentally ill: a descriptive analysis from the uniform client data instrument. *Community Support Service J* 1981; 2:4-9
2. Liberman RP, Corrigan PW, Schade ML: Drug and psychosocial treatment interactions in schizophrenia. *Int Rev Psychiatry* 1989; 1:283-295
3. Paul GL, Lentz RJ: *Psychosocial Treatment of Chronic Mental Patients*. Cambridge, Mass, Harvard University Press, 1977
4. Stein LI, Test MA: An alternative to mental hospital treatment. *Arch Gen Psychiatry* 1980; 37:392-397
5. Fairweather GW, Sanders DJ, Maynard H: *Community Life for the Mentally Ill*. New York, Aldine Press, 1969
6. Bachrach LL: Overview: model programs for chronic mental patients. *Am J Psychiatry* 1980; 137:1023-1031
7. Backer TE, Liberman RP, Kuehnel TG: Dissemination and adoption of innovative psychosocial interventions. *J Consult Clin Psychol* 1986; 54:111-118
8. Wallace CJ, Liberman RP: Social skills training for patients with schizophrenia: a controlled clinical trial. *Psychiatry Res* 1985; 15:239-247
9. Falloon JR, Boyd JL, McGill CW, Williamson M, Razani J, Moss HB, Gilderman AM, Simpson GM: Family management in the prevention of morbidity of schizophrenia: clinical outcome of a two-year longitudinal study. *Arch Gen Psychiatry* 1985; 42:887-896
10. Hogarty GE, Anderson CM, Reiss DJ, Kornblith SJ, Greenwald DP, Javna CD, Madonia MJ: Family psychoeducation, social skills training, and maintenance chemotherapy in the aftercare treatment of schizophrenia, I: one-year effects of a controlled study on relapse and expressed emotion. *Arch Gen Psychiatry* 1986; 43:633-642
11. Benton MK, Schroeder HE: Social skills training for schizophrenics: a meta-analytic evaluation. *J Consult Clin Psychol* 1990; 58: 741-747
12. DeJong A, Giel R, Sloof CJ: Social disability and outcome in schizophrenic patients. *Br J Psychiatry* 1985; 147:631-636
13. Presley AS, Grubb AB, Semple DL: Predictors of successful rehabilitation in long stay patients. *Acta Psychiatr Scand* 1982; 66: 83-88
14. Sylph JA, Ross HE, Kedward HB: Social disability in chronic psychiatric patients. *Am J Psychiatry* 1977; 134:1391-1394
15. Liberman RP: Coping and competence as protective factors in the vulnerability-stress model of schizophrenia, in *Treatment of Schizophrenia*. Edited by Goldstein MJ, Hand I, Hahlweg K. New York, Springer-Verlag, 1986
16. Wallace CJ, Boone SE, Donahoe CP, Foy DW: The chronically mentally ill: independent living skills training, in *Clinical Handbook of Psychological Disorders*. Edited by Barlow D. New York, Guilford Press, 1985
17. Liberman RP, Jacobs HE, Boone SE, Foy DW, Mueser KT: Skills training for the community adaptation of schizophrenics, in *Management of Schizophrenia*. Edited by Brenner BW. Toronto, Hans Huber, 1986
18. Shrout PE, Fleiss JL: Intraclass correlations: uses in assessing rater reliability. *J Consult Clin Psychol* 1979; 86:420-428
19. Bartko JJ: On various intraclass correlation reliability coefficients. *Psychol Bull* 1976; 83:762-765
20. Eckman TE, Liberman RP, Phipps CC, Blair K: Teaching medication management skills to schizophrenic patients. *J Clin Psychopharmacol* 1990; 10:33-38
21. Mueser KT, Bellack AS, Douglas MS, Morrison RL: Prevalence and stability of social skills deficits in schizophrenia. *Schizophr Res* (in press)
22. Wirshing WC, Eckman TE, Liberman RP, Marder SR: Management of risk of relapse through social skills training of chronic schizophrenics, in *Schizophrenia Research: Advances in Neuropsychiatry and Psychopharmacology*, vol 1. Edited by Tamminga CA, Schulz SC. New York, Raven Press, 1991
23. National Institute of Mental Health: *Caring for People With Severe Mental Disorders: A National Plan of Research and Services*: DHHS Publication ADM 91-1762. Washington, DC, US Government Printing Office, 1991
24. National Institute of Mental Health: *A National Plan for Schizophrenia Research*: DHHS Publication ADM 88-1570. Washington, DC, US Government Printing Office, 1988
25. Lehman AF: Strategies for improving services to the chronic mentally ill. *Hosp Community Psychiatry* 1989; 40:916-920