

Serving Street-Dwelling Individuals With Psychiatric Disabilities: Outcomes of a Psychiatric Rehabilitation Clinical Trial

ABSTRACT

Objectives. This study tested a psychiatric rehabilitation approach for organizing and delivering services to street-dwelling persons with severe mental illness.

Methods. Street-dwelling persons with severe mental illness were randomly assigned to the experimental program (called Choices) or to standard treatment in New York City. We assessed study participants at baseline and at 6-month intervals over 24 months, using measures of service use, quality of life, health, mental health, and social psychological status. The average deviation from baseline summary statistic was employed to assess change.

Results. Compared with persons in standard treatment (n=77), members of the experimental group (n=91) were more likely to attend a day program (53% vs 27%), had less difficulty in meeting their basic needs, spent less time on the streets (55% vs 28% reduction), and spent more time in community housing (21% vs 9% increase). They showed greater improvement in life satisfaction and experienced a greater reduction in psychiatric symptoms.

Conclusions. With an appropriate service model, it is possible to engage disaffiliated populations, expand their use of human services, and improve their housing conditions, quality of life, and mental health status. (*Am J Public Health*. 2000;90:1873–1878)

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Homelessness continues to be a serious public health problem in the United States. In addition to their poverty and housing needs, homeless individuals have multiple health and mental health problems.^{1,2} Best estimates indicate that approximately one third of homeless individuals have severe mental illness,^{3,4} with about one half comorbid for alcohol and substance abuse disorders⁵ and at least one half comorbid for health problems.⁶ Homeless individuals with mental illness also have greater problems with social and family relationships, employment, and the criminal justice system than do homeless individuals without mental illness.³

These health, mental health, and social service problems require access to multiple human service systems, each with a unique set of eligibility requirements for participation.⁷ While homeless persons with mental illness have been characterized as resistant to treatment because they often reject help offered by mental-health and other providers, we now believe that these individuals will use services when the services address their self-defined needs and are delivered in ways that facilitate rather than frustrate access.^{8–10} Designing effective engagement strategies and minimizing barriers to access, however, continue to be major challenges for human service systems, which are typically characterized by limited resources, rigidly controlled eligibility requirements, and highly fragmented structures.¹¹

This study tested an alternative approach for organizing and delivering services to street-dwelling persons with severe mental illness. The experimental approach was specifically designed to overcome access barriers and any dissonance between offered services and subject-defined needs.¹²

We hypothesized that owing to the individualized engagement strategies and rehabilitation techniques practiced at the experimental program, experimental subjects would obtain greater access to the full range of re-

sources needed for successful community living. This would be evidenced by increased use of community services by experimental subjects compared with individuals in the standard treatment condition. Next, we predicted that individuals in the experimental condition would experience greater improvements in their housing status, evidenced by less time living on the streets and more in shelters and community housing. We thought that, given an improved housing status and better access to treatment and support resources, individuals in the experimental group would report higher quality of life than would control group participants. Improved access to treatment also suggested that experimental subjects would report a greater reduction in psychiatric symptoms. Finally, since a major focus of psychiatric rehabilitation is on achievement of individually defined goals, we expected that experimental subjects would report higher self-esteem and greater feelings of mastery.

On the basis of technology developed at the Boston University Center for Psychiatric Rehabilitation,¹³ an approach was crafted to address key structural and functional New York City service system deficits. As in most systems, the New York City homelessness treatment and support system is structurally seg-

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mented and transitionally oriented, requiring engagement with multiple programs and caregivers to negotiate a pathway out of homelessness. Functionally, the system has a strong normative orientation in which set pathways in and out of services are prescribed and adherence to behavioral norms are mandated for successfully obtaining and maintaining housing (e.g., remaining sober as prerequisite for entry into a community reintegration program).¹⁴ In contrast, the experimental program, called Choices, was designed to be structurally continuous and idiographic in orientation, with caregiver behavior directed by client-defined choices about engaging in rehabilitative treatment and defining their needs and goals.¹⁵

Methods

Experimental and Standard Treatment Conditions

Street-dwelling individuals with severe mental illness who provided informed consent were randomly offered participation in the experimental Choices program or information about “standard treatment”—that is, the existing array of homelessness and specialty mental health services in New York City. To ensure replicable research findings, we chose the well-codified technology developed by the Center for Psychiatric Rehabilitation as the basis for the program intervention.¹³ This technology and its underlying values emphasize individual choice, continuity in relationships, and skills development and support to foster achievement of personal goals. This technology has been demonstrated as effective in numerous experimental and quasi-experimental studies.¹⁶

Choices had the following 4 major features:

1. Outreach and engagement, designed to foster the development of rudimentary relationships between Choices staff and homeless individuals.

2. Invitation to attend and join the Choices Center, a low-demand environment where desirable resources (e.g., showers, food) were available for only the experimental study participants from 7 AM to 7 PM daily. Participation in structured group activities was not required, but assistance was available to anyone requesting help in obtaining health, mental health, dental, and social services and in developing and implementing individual rehabilitation plans. Additionally, the center provided an opportunity for members to meet new friends and socialize.

3. Respite housing in 10-bed, informal church-based shelters or in blocks of YMCA rooms rented by the program and overseen by program staff.

4. In-community and on-site rehabilitation services to assist individuals in finding and maintaining community-based housing.

The Choices program was similar in structure to an intensive case management program,^{17,18} with a client-to-staff ratio of about 13:1. Choices was staffed by 6 rehabilitation specialists who received extensive training and ongoing supervision from Boston University personnel and respite staff who oversaw the respite housing and operated the center on weekends and holidays. Many respite staff had themselves been homeless and many were in recovery from alcohol or substance abuse; their presence added experiential knowledge to the program's available resources. A psychiatrist visited the program weekly for informal consultations, and a public health nurse was also on staff 8 hours per week. A more detailed description of the Choices program is presented in Shern et al.¹⁹ The Choices program was found to faithfully represent the key components of the psychiatric rehabilitation model through both quantitative²⁰ and ethnographic assessments.¹²

We conducted a detailed study of standard treatment in New York City to understand the services available to individuals in the control condition.¹⁴ Standard treatment involved a range of programs for homeless individuals and specialty programs for homeless persons with mental illness. These included outreach services, drop-in centers, case management programs, mental health and health services, soup kitchens, municipal and private shelters, and specialized municipal shelters for persons with psychiatric disabilities. Approximately 2700 units of specialty housing for persons with mental illness were developed through a joint city/state program. This housing, which varied from structured community residences to independent apartments, was available to experimental and control subjects. Owing to problems in gaining access to this housing, Choices developed special relationships with housing providers and eventually its own housing program to help ensure access for difficult-to-place clients.

Study Sample

Research participants were recruited directly from the streets of midtown and downtown Manhattan through direct observation by highly trained research interviewers (56%) or referral by outreach teams (44%). Most referrals came from a collaborating mobile emergency and outreach team, Project HELP.²¹ A structured screening instrument, which operationalized the required eligibility criteria for research participation, was completed for each potential subject. The criteria included (1) hav-

ing spent at least 7 of the last 14 nights homeless (i.e., sleeping in any space not designed for overnight accommodation); (2) meeting New York State's definition of serious and persistent mental illness, a definition that is generally consistent with those used throughout the country²² and one that includes evidence of mental illness (individuals with an exclusive diagnosis of chemical abuse/dependence or mental retardation would not be included) combined with serious disability resulting from mental illness; (3) being 18 years or older; and (4) being judged not to be dangerous to themselves or others. Only 3 subjects were rejected for the dangerousness criterion.

The screening protocol employed scales from the Psychiatric Epidemiology Research Instrument,²³ which have been shown to be predictive of psychiatric diagnosis,²⁴ and gate questions from the Diagnostic Interview Schedule²⁵ for major affective disorders. The gate questions have been successfully used with other homeless populations. Both self-report and observational data were used to complete the screening.

Of approximately 400 individuals recruited on the basis of interviewer observation or referral information, 308 remained eligible after screening. Of these, 168 (55%) agreed to participate and completed the baseline interview. Random assignment procedures resulted in 91 individuals' being assigned to the Choices experimental program and 77 to the standard treatment control condition ($\chi^2=1.16$; not significant). Individuals in the control group were provided information by the research interviewers about local homelessness service programs. For persons assigned to the Choices program, interviewers attempted to coordinate first meetings with Choices program staff.

Few differences distinguished the individuals who participated ($n=168$) from those who did not ($n=140$). Individuals of Hispanic origin consented at a higher rate (81% vs 52% than non-Hispanic individuals; $\chi^2_1=6.46$, $P<.05$). Clinically, study participants were more likely to report a prior hospitalization (62% vs 38%; $\chi^2=6.49$, $P<.05$).

Of the 168 research participants, no differences were found between the experimental and control groups on any of the sociodemographic or clinical (symptoms, prior hospitalizations) variables included in the screening instrument. The typical subject was non-Hispanic (90%), Black (61%), male (76%), single (88%), and aged approximately 40 years (mean=39.97, range=21–66). Most were unemployed (98%), with 73% having not held a job in over 1 year. Almost half (46%) had not completed high school. The sample was characterized by chronic homelessness. Nearly half (48%) reported more than 1 episode of homelessness, and 61% of the remaining subjects

who reported only 1 episode had been homeless for 4 or more years.

The Structured Clinical Interview for the *Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition (DSM-III-R)*²⁶ was used with a random subsample of 57 participants to verify the accuracy of the street-screening procedures for assessing severe mental illness. Data showed that only 9% (n=5) were found to have no major mental illness diagnosis and 54% (n=31) received a lifetime alcohol or substance abuse disorder diagnosis, yielding a dual-diagnosis rate of 47%.

The potential for high rates of sample attrition was a major risk for this study, given the homelessness and system disaffiliation characteristic of our participants. We remained in contact with 69% of all subjects throughout the 24 months of follow-up. However, differential attrition occurred between the experimental and control conditions, with fewer experimental subjects lost to follow-up. High mortality also characterized this sample: 9 deaths occurred over the 24 months, a 2.5% mortality rate per year. Individuals with whom we remained in contact over the course of the study did not differ from those lost to follow-up on any demographic, clinical, or homelessness history characteristic as measured at baseline. We chose analytic techniques that allowed us to include all observations from each subject, including all available observations for individuals who ultimately left the study.

Measures

Research participants were followed intensively for 24 months by research interviewers specially trained in locating and contacting homeless individuals. Additionally, state and municipal computer databases were searched routinely to help locate missing subjects. To assess participant outcomes, 2 face-to-face interview protocols were used. Data from both protocols were employed to assess the major hypothesized outcomes associated with participation in the experimental program.

With the first protocol, interviewers attempted to contact subjects biweekly to complete a brief service use and housing status questionnaire. A structured recall method was employed to account for where the respondent slept each of the last 14 nights; it included a systematic review of human services use, documenting formal and informal resources used by the respondent to meet basic survival, health, mental health, chemical abuse, and social service needs. Many of the service use measures were adapted from those employed by Barrow et al.²⁷⁻²⁹ in their homelessness research. The questionnaire included questions asking subjects to report, using a 4-point frequency scale (i.e., always to never), the degree of difficulty

that they experienced in obtaining needed services, as well as questions related to specific use of services (e.g., number of emergency room visits, arrests).

The second protocol was a lengthy structured interview completed at baseline and reattempted at 4 successive 6-month follow-up points. The interview gathered detailed information regarding quality of life, health, mental health, and social psychological status, employing scales that had been developed for and in some cases successfully used with individuals with severe mental illness.³⁰ Instruments included Lehman's Quality of Life Scales,³¹ the Colorado Symptom Index,³² Rosenberg's Self-Esteem Scale,³³ and Pearlin and Schooler's Mastery Scale.³⁴ The average α reliability coefficient for all scales was .87.

Optimally, the interview schedule would have resulted in biweekly contacts with all subjects. However, given the difficulties of following extremely mobile street-dwelling individuals, we never anticipated obtaining complete data for all subjects. In reality, we succeeded in conducting a housing status/service use protocol about every 7 weeks per subject (median=7.4 weeks, range=87.7 weeks). The total number of observations over 24 months varied between 1 and 55 (median=12 observations). Eighty-two percent (n=138) of respondents completed at least 1 of the more lengthy 6-month follow-up interviews, with 44% (n=74) of the subjects completing all 4.

Analysis

Analyses of change in this study were complicated by missing observations on most subjects. Missing data precluded our use of conventional repeated-measures analysis of variance techniques. Because such models require complete data for every subject, many of our cases would have been dropped from analysis. Fortunately, alternative techniques now exist that can accommodate missing observations and thus allow use of all available data, including random regression³⁵ and the summary statistics approach advanced by Dawson and Lagakos.³⁶ Examples of the use of univariate summary statistics in the analysis of repeated-measures designs may be found in Di Bisceglie et al.³⁷ and Dawson.³⁸

The summary statistic method adopted as our analytic strategy modeled change by using the average deviation from baseline (ADB), a simpler version of the area under the curve statistic used by Di Bisceglie et al.^{37,39} An ADB for a given measure is formed by averaging an individual's available follow-up observations and subtracting the baseline observation from that average. The ADB represented the average change experienced over the course of the 24-month intervention, adjusted to account for

baseline scores. Between-group comparisons were then conducted by an independent-samples *t* test.

We compared outcomes for the 2 groups across 5 domains: unmet needs, housing status, quality of life, psychological status, and service use. Multiple comparisons were conducted within each domain. To account for this, we employed a modified Bonferroni procedure⁴⁰ within each domain to correct for the higher probability of significant findings when there are multiple tests.

The summary statistic approach facilitated examining for potential biases associated with sample attrition. We carried out comparisons for cohorts that varied in the length of study participation on all outcome measures. In no instance were between-group results for subjects who left the study early at odds with the findings for all subjects. We therefore feel confident that our summary statistic approach fairly represents study findings.

Results

Unmet Needs

Table 1 presents information regarding individuals' ability to meet their basic food, clothing, shelter, and personal care needs. Compared with control subjects, individuals in the experimental group reported significantly less difficulty getting food ($t=2.99, P<.01$), finding a place to sleep ($t=3.02, P<.01$), and keeping clean ($t=3.07, P<.01$). (All of the reported *t* tests involve approximately 167 degrees of freedom and are 2-tailed.)

Housing Status

Table 1 also summarizes the changes in living situation experienced by both groups over the 24-month intervention. While both groups showed substantial decreases in the time spent on the streets, the rate of decline was approximately twice as great for the experimental group as for the control group ($t=4.18, P<.001$). Consistent with their street-dwelling status at baseline, individuals in the control group continued not to use shelters. However, individuals assigned to the Choices condition reported a 23% increase in the proportion of time spent in shelters, using the Choices-provided respite housing almost exclusively ($t=-5.73, P<.001$).

The community housing category encompassed the full range of community housing options, from transitional settings (e.g., hotel rooms, community residences) to long-term settings (e.g., apartments). Over the course of the study, experimental clients increased their amount of time in community housing at

TABLE 1—Changes From Baseline in Street-Dwelling Individuals' Unmet Needs, Housing Status, Quality of Life, and Psychological Status: New York City, 1991–1994

Measure	Change From Baseline				<i>t</i>	<i>P</i>
	Experimental Group (<i>n</i> =91)		Control Group (<i>n</i> =77)			
	Mean	SD	Mean	SD		
Unmet needs (change in difficulty meeting basic needs)						
Getting food	-0.84	1.13	-0.31	1.11	2.99	.003 ^a
Having a place to sleep	-1.06	1.10	-0.48	1.31	3.02	.003 ^a
Getting clothing	-0.80	1.29	-0.47	1.38	1.61	.109 ^a
Keeping clean	-0.95	1.14	-0.34	1.41	3.07	.003 ^a
Finding a bathroom	-0.70	1.15	-0.46	1.15	1.36	.175
Keeping possessions	-0.85	1.08	-0.72	1.20	0.71	.48
Housing status (change in proportion of time spent in residential setting)						
Streets	-54.93	36.92	-28.22	44.49	4.18	.001 ^a
Shelters	23.08	29.27	2.79	15.23	-5.73	.001 ^a
Community living	21.01	30.39	9.94	32.34	-2.27	.025 ^a
Institutions	13.53	22.28	15.86	32.81	0.53	.599
Quality of life (change in satisfaction in life area)						
Overall	1.19	1.99	-0.02	1.65	-4.21	.001 ^a
Leisure	0.72	1.72	0.18	1.31	-2.23	.027 ^a
Financial	1.06	1.79	-0.12	1.67	-4.33	.001 ^a
Safety	1.12	1.95	0.36	1.35	-2.85	.005 ^a
Health	0.70	1.57	0.09	1.19	-2.78	.006 ^a
Family	0.94	1.97	0.14	1.29	-2.86	.005 ^a
Social	0.45	1.75	-0.05	1.18	-1.93	.56
Psychological status (change in psychiatric symptoms, self-esteem, mastery)						
Symptoms (anxiety, depression, thought disturbance)	-0.28	0.69	0.04	0.72	2.74	.007 ^a
Self-esteem	0.05	0.37	-0.02	0.41	1.11	.268
Mastery	0.06	0.45	0.02	0.35	0.58	.563

Note. All means reflect the average deviation from baseline scores. A 4-point scale was used.

^aSignificant after modified Bonferroni adjustment.

twice the rate of persons assigned to standard treatment ($t=2.27$, $P<.05$). A comparison of where subjects were living at the end of the study shows the result of this differential trend: at their final follow-up data collection point, 38% of experimental subjects were residing in community settings, as contrasted with 24% of control-group participants.

Interestingly, time spent in institutional settings, which included psychiatric, medical, and forensic inpatient facilities, increased by about 13% to 16% for both groups. This change probably reflects simply a regression to mean levels of institutionalization for this population.

Quality of Life

Table 1 includes a summary of between-group differences in life satisfaction across 7 life areas.³⁰ Individuals in the experimental condition reported consistently greater improvement in life satisfaction than their peers in the control group in 6 of the 7 life areas. In most areas, gains reported by individuals in the experimental group were substantial, often 0.5 standard deviation greater than changes reported by individuals in the control group.

Psychological Status

This domain included assessments of psychiatric symptoms, self-esteem, and mastery. As shown in Table 1, the experimental subjects reported significantly greater reductions in anxiety, depression, and thought disturbances than did control group participants ($t=2.41$, $P<.001$). Between-group differences were not significant for either mastery or self-esteem, with ratings for both groups on these measures remaining stable over time.

Service Use

Service use data are presented in Table 2. The summary statistic used here is not the ADB (the absence of this set of variables from the baseline interview precluded using the ADB) but rather the percentage of individuals using the service at least once in a given 6-month follow-up period, averaged over all available follow-ups. Experimental subjects were much more likely to attend a day program, attending at twice the rate of control subjects ($t=4.39$, $P<.01$). This difference largely reflects attendance at the Choices Center. Although

between-group differences in the use of other services did not reach statistical significance, absolute rates of service use were generally higher for the experimental group.

Discussion

In the aggregate, these results indicate that the experimental program was more successful in serving and housing individuals with severe mental illness who lived on the streets than was the standard treatment system in Manhattan. At a minimum, the results indicate that with an appropriate service model, it is possible to engage disaffiliated populations, expand their use of human services, and improve their housing conditions, quality of life, and mental health status.

This project may have important implications for the design of human services, particularly as we continue to debate health care reform strategies and consider their implications for the most vulnerable and disaffiliated populations. Perhaps most important is the need to systematically assess barriers to the receipt of needed services for populations that choose

TABLE 2—Use of Services Among Street-Dwelling People as a Percentage of Subjects Receiving the Service at Least Once During a 6-Month Follow-Up Period: New York City, 1991–1994

Measure	% Receiving Service				t	P ^a
	Experimental Group (n=91)		Control Group (n=77)			
	Mean	SD	Mean	SD		
Service						
Any help	74.01	28.11	72.07	33.52	0.37	.710
Cash entitlement	46.69	31.75	33.72	32.91	2.44	.016
Health insurance	34.18	30.29	21.34	28.56	2.65	.009
Alcohol/drug	27.25	31.95	16.08	24.83	2.41	.017
Emergency department	21.97	30.47	24.63	31.89	0.52	.606
Psychiatric medications	43.80	43.70	26.19	37.90	2.52	.013
Outpatient care	35.86	32.75	27.33	33.01	1.58	.118
Inpatient care	20.26	27.50	17.38	30.86	0.59	.554
Day program	52.73	37.62	27.30	33.32	4.39	.001*
Outreach	45.41	36.33	40.87	38.55	0.73	.465
Self-help	31.29	33.50	21.16	32.12	1.88	.062
Inpatient alcohol/drug	6.31	15.43	3.62	14.92	1.08	.283
Outpatient alcohol/drug	6.03	15.62	4.07	14.61	0.79	.431
Dentist	15.47	26.22	9.02	20.18	1.71	.089
Police contact	26.78	28.44	41.02	38.85	2.49	.014
Jail	7.43	17.23	7.77	21.65	1.10	.918
Court	19.48	28.08	15.50	24.88	0.92	.360
Other help	36.70	35.34	31.69	36.91	0.84	.403

Note. All means reflect the percentage of subjects using the service at least once in a 6-month period.

^aP value was significant after the modified Bonferroni adjustment was applied.

not to or are unable to gain access to services through usual channels. Not surprisingly, given the Boston University philosophy and technology in which the Choices staff had been trained, several participants reported that the Choices program was unlike any other they had encountered because the staff genuinely attempted to help them realize their own self-defined goals.¹² Choices clients reported that most other programs would prescribe both the appropriate goal (e.g., psychiatric treatment, sobriety) and the required steps to achieve it.

Our analysis of the standard treatment condition was consistent with their reports.¹⁴ While such programs are surely well-intentioned, the prescription of both means and ends and restriction of services and resources to clients who are compliant with these prescriptions may frustrate access for underserved populations. It is important to underscore that such provider practices usually are not grounded on systematic investigations of service effectiveness but more typically on scattered data from self-selecting caseloads as well as beliefs derived from dominant treatment paradigms.

It is interesting to note that Choices participants did not use general medical or mental health treatment resources (Table 1) at any greater rate than control group participants. It was our observation that most of the generic services and supports available in the community were not used by clients in the experi-

mental group at any greater rate than by clients in the control group. In fact, we noted that both experimental and control participants used emergency and inpatient services at approximately equivalent rates, which we may not have expected because programs like Choices are often associated with decreased inpatient and emergency use.¹⁷ We found that, even with strong advocacy, individuals in the Choices program preferred to receive most services solely through Choices.

Access to housing resources, even specialty housing for homeless persons, proved very difficult to obtain. To gain access to needed housing for this street-dwelling population, we developed close relations with a supported apartment program and ultimately were forced to initiate our own supported apartment program.^{40,41} We therefore found it necessary to control the full spectrum of resources to meet the needs of our clientele. It would have been preferable to gain better access to generic resources, thereby integrating Choices clients into the surrounding community rather than continuing to segregate them.

These results raise further empirical questions. What is the most effective program model for providing services to homeless individuals who have severe psychiatric disabilities and comorbid substance abuse and physical health problems? Is it a model that strives to simulate an integrated system through advocacy and referrals to various providers, or is it a model in which a multidisciplinary team provides services directly?

The study also has several important limitations. First, although we have ethnographically¹² and quantitatively described important characteristics of the experimental program and standard treatment control,¹⁴ the design does not permit us to rigorously test the varying components of the experimental model to determine its most important elements. We also have not explicated the characteristics of individuals for whom the intervention may be particularly effective; instead, we have restricted our analyses to “intent to treat.” While we could not identify any important differences between individuals whom we successfully followed and those who were lost to follow-up, attrition is always an important consideration in generalizing these results to the overall population of homeless persons. Similarly, persons who refused to participate in the research may also represent an important component of the homeless population with mental illness to whom we cannot generalize. Finally, individuals who were not competent to give informed consent could not participate in the research. Although very few individuals consistently were judged to be incompetent, a few gravely ill individuals could not participate in the trial.

Conclusion

As we continue to debate the structure and functions of a more efficient mental health

care system, it is critically important to assess systematically the assumptions upon which such a system is designed. In this project, we purposely selected a population of individuals who were not being well served by the existing system. These individuals in effect provided a window through which we observed the functioning of that system. By carefully following this cohort, we documented both the effectiveness of a psychiatric rehabilitation approach and some of the assumptions and operating procedures of the existing "standard treatment" system that may underlie poorer client outcomes. It is only by conducting such careful examination, documenting both processes and outcomes of system structure and functioning, that we will be successful in developing a health care system that works even for those most disaffiliated. □

Contributors

D. L. Shern was the principal investigator of the project; he oversaw all aspects of the research. S. Tsemberis was a coprincipal investigator of the research and directed the experimental program. W. Anthony was a coprincipal investigator of the project; along with J. Winarski and M. Cohen, he oversaw the development and implementation of the experimental rehabilitation program. A. M. Lovell was the research director; along with L. Richmond, she oversaw all aspects of the data collection, including supervision of the field staff and collection of the qualitative data. C. J. Felton was the principal data analyst for the project; he managed all of the data files and completed the statistical analyses presented in the paper.

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