An Evaluation of a Hybrid Occupational Therapy and Supported Employment Program in Japan for Persons With Schizophrenia

Masao Oka, Kensei Otsuka, Nuburo Yokoyama, Jim Mintz, Kenyo Hoshino, Shin-Ichi Niwa, Robert Paul Liberman

OBJECTIVE. A vocational rehabilitation program (occupational therapy and supported employment) for promoting the return to the community of long-stay persons with schizophrenia was established at a psychiatric hospital in Japan. The purpose of the study was to evaluate the program in terms of hospitalization rates, community tenure, and social functioning with each individual serving as his or her control.

METHODS. Fifty-two participants, averaging 8.9 years of hospitalization, participated in the vocational rehabilitation program consisting of 2 to 6 hours of in-hospital occupational therapy for 6 days per week and a post-discharge supported employment component. Seventeen years after the program was established, a retrospective study was conducted to evaluate the impact of the program on hospitalizations, community tenure, and social functioning after participants' discharge from hospital, using an interrupted time-series analysis. The postdischarge period was compared with the period from onset of illness to the index discharge on the three outcome variables.

RESULTS. After discharge from the hospital, the length of time spent by participants out of the hospital increased, social functioning improved, and risk of hospitalization diminished by 50%. Female participants and those with supportive families spent more time out of the hospital than participants who were male or came from nonsupportive families.

CONCLUSION. A combined program of occupational therapy and supported employment was successful in a Japanese psychiatric hospital when implemented with the continuing involvement of a clinical team. Interventions that improve the emotional and housing supports provided to persons with schizophrenia by their families are likely to enhance the outcome of vocational services.

Vocational rehabilitation has been shown to enhance vocational, social, and quality of life outcomes in persons with schizophrenia (Bond, 1992; Lehman, 1995; Rebeiro, Day, Semeniuk, O’Brien, & Wilson, 2001). A meta-analytic review showed an association of vocational interventions with reduced hospital admission (Bond). Other improvements associated with vocational rehabilitation include an increased likelihood of medication adherence (Kulda & Dirks, 1977) and an improvement in social participation and family role performance (Wolkon, Karmen, & Tanaka, 1971). Vocational rehabilitation has also been related to improvements in work-related outcomes such as rates of paid employment, duration of employment, higher wages, and more job starts (Bond). However, no studies have reported long-term effects on therapeutic outcomes after vocational rehabilitation (Bond; Lehman, 1995).

Follow-up studies have been a useful tool for evaluating the natural course of schizophrenia and long-term outcomes of psychiatric treatment (Fenton & McGlashan, 1991; Harding, Brooks, Takama, Strauss, & Breier, 1987; McGlashan, 1984; Ogawa et al., 1987). Despite their methodological limitations,
such as lack of randomization and experimental designs, long-term follow-up studies may provide information regarding the course of treatment and rehabilitation that can generate hypotheses for guiding future controlled research. In the follow-up study reported here, a hybrid model of vocational rehabilitation, consisting of occupational therapy and supported employment, was developed and evaluated at a psychiatric hospital in Japan. Hospitalization rates, community tenure and social adjustment, and community tenure and employment up to 17 years after discharge were assessed and compared with the same variables rated for the period from onset of illness to the point of discharge.

Methods
Hospital Setting

The psychiatric hospital that sponsored the vocational rehabilitation program and this research was located in Fukushima Prefecture, a semirural farming area of Honshu island in Japan, 150 miles north of Tokyo. The hospital was affiliated with Fukushima Medical University for training of medical students but was staffed with nonacademic professionals organized into multidisciplinary teams. Inpatient units had teams that included psychiatrists, nurses, occupational therapists, social workers, psychologists, and psychiatric technicians. After discharge from the hospital, individuals continued to receive their aftercare through the hospital’s outpatient clinic that offered medication, supportive therapy, crisis intervention, and outreach services such as home visits. As the sole public mental hospital in the region, individuals were readmitted for appropriate clinical indications.

Participants

Chart reviews and surveys were completed for 52 persons diagnosed with schizophrenia (36 men and 16 women), with a mean age of 51 years at the time of follow-up, who were consecutively discharged from the hospital between 1976 and 1990. Their first discharge from the hospital after beginning their participation in the occupational therapy component of the vocational rehabilitation program was considered the index discharge that divided the two study periods into pre- and postdischarge. Their mean age at onset of schizophrenia was 23 and their mean duration of hospitalization was 8.9 years with a range of 1–22 years. It should be noted that, in contrast to the relatively brief hospitalizations in the United States, persons with schizophrenia are typically hospitalized for many years in Japan. Long hospital stays are a result of the payment contingencies for mental health services by Japan’s national health insurance that favors hospital care, limited availability of community-based services, and the great stigma placed on schizophrenia in Japanese culture. All participants in this study were diagnosed with schizophrenia using DSM-IIIR (American Psychiatric Association, 1989) criteria.

Vocational Rehabilitation Program

The hospital’s vocational rehabilitation program began in 1976 with a combination of hospital-based occupational therapy and postdischarge-supported employment available to all participants. At the time of discharge, individuals were placed into paid, supported employment positions in the community. After discharge, participants in the study were followed in the community by a clinical team for a minimum of 3 years. Occupational therapy and supported employment were conducted primarily by occupational therapists who provided their services in designated locations throughout the hospital and in the community. Occupational therapists were assisted by licensed nurses who received instruction and supervision from the therapists.

Occupational therapy for persons with serious mental illness in this hospital, as throughout Japan, was based on conceptual models and methods of assessment and intervention that have informed psychosocial occupational therapy in the United States (Barrows, 1996; Brown, Moore, Hemman, & Yunek, 1996; Fidler & Fidler, 1994; Holm, Santangelo, Brown, & Walter, 2000; Kielhofner, 1985; MacCrae, 1997; Rebeiro et al., 2001). Specific modes of assessment and intervention were influenced by the following conceptual frameworks: Model of Human Occupation, human development, sensory integration, and behavior therapy (Corrigan & Liberman, 1994; Kielhofner; King, 1975, 1978; Reilly, 1966; Sieg, 1974). Overall goals of the occupational therapy component of the rehabilitation program included improvements in daily living skills; attendance, promptness, and sustained participation in activities; reduced supervision required for program participation; improvements in decision making and problem solving during activities; improvements in attentiveness and comprehension during task involvement; and improved quality of performance and social interactions with staff and other patients.

Participants in this study began their involvement in hospital-based occupational therapy with a functional assessment of their activities of daily living, interpersonal and verbal skills, cognitive functioning, degree of supervision required for task involvement, cooperativeness, and volition in ward routines and past and present participation.
in vocational activities (Asher, 1989; Brollier, Watts, Bauer, & Schmidt, 1988; Fidler, 1963; Vaccaro, Pitts, & Wallace, 1992). The functional assessment was anchored in the participants’ vocational interests and personally relevant goals (Rogers, Weinstein, & Figone, 1978). Personal goals of each participant were integrated with the results of the functional assessment for developing individualized treatment plans for enhancing occupational capacities (Smith, 1990). The functional assessments and treatment plans for improving vocational performance were conducted by occupational therapists and were updated every 4 months. Once involved in the work activities used in occupational therapy, participants were assessed regularly for their judgment, decision making, distractibility, and persistence and pace in the activities.

While hospitalized, participants were scheduled for occupational therapy 6 days per week for 2 to 6 hours each day, depending upon their work tolerance, clinical status, ward behavior, and cognitive functioning. Based on the initial and ongoing functional assessments, occupational therapists used motivational techniques to engage, encourage, and reinforce participation in work-related activities (Riopel, Kielhofner, & Watts, 1986). These individualized interventions were particularly important since most of the participants had long periods of hospitalization and suffered from institutionalism. Therapy activities included gardening, agriculture work (pig, cow, and vegetable farming), handicrafts (Japanese paper art, knitting), and making paper products such as gift bags and envelopes. These activities and the social and physical environments in which they were held were adapted to meet the participants’ cognitive and functional levels so that incremental success and positive reinforcement were maximized (Barris, 1982; Kiernat, 1982).

The summaries of progress in the therapeutic goals every 4 months were used by the occupational therapists to reevaluate individual participant’s treatment plans and make changes as needed in short-term goals and modes of intervention. Monthly interdisciplinary team conferences were organized and led by occupational therapists with the participation of psychiatrists, nurses, and social workers. Clinical and observational information was exchanged during these conferences with each discipline contributing its assessments of participants and recommendations for modifying and fine-tuning treatment plans.

As participants approached discharge, occupational therapists involved them in supported employment. Job placement and on-site coaching were integrated by occupational therapists who regularly communicated with colleagues providing mental health services, medications, case management, and supportive therapy. Occupational therapists worked with local businesses, coordinated by a Vocational Helper Liaison Council, to find employment for participants that fit their preferences, strengths, and deficits. Vocational helpers, who were regular employees at the worksite, oriented, trained, and supervised participants.

After being placed in a job, participants were discharged from the hospital to live in company-owned housing, a community residential home, or to live independently in a house or apartment. Despite the company housing and the residential homes, some participants who were placed in jobs could not obtain housing. In these situations, the participants would go to work in the day and return to the hospital at night to live until other residential arrangements could be found.

After discharge, participants in supported employment were expected to visit the hospital’s aftercare clinic at least twice monthly for review of their medication with a psychiatrist and supportive group therapy sessions with a social worker and a psychologist. Also, participants were visited at their workplace one to four times a month by occupational therapists, who consulted with the employer and vocational helper for problem solving and provided job coaching as needed. All companies offered normalized employment environments where participants and non-mentally ill employees worked side-by-side. One exception was a clothing manufacturer who predominantly hired disabled workers.

Study Design

Starting from the time that sufficient information in the chart permitted evaluation of participants’ social functioning, community living, and hospitalizations, investigators reviewed consecutive 30-day periods for all clinically relevant information. The starting time for these 30-day periods varied, but usually began at the time of the participant’s onset of illness. The 30-day periods continued through the time of index discharge to the final follow-up assessment. The minimum follow-up period after discharge was 3 years.

The study design centered on the evaluation of each patient’s 30-day periods of chart information before and after the index discharge from hospital. The number of 30-day periods available for evaluation before discharge varied across participants because of differences among participants in the length of their illnesses, their duration of hospitalization prior to the index discharge, and the duration of their postdischarge periods. In other words, some participants were discharged from the hospital earlier in the 1976–1990 interval thereby having longer postdischarge durations and more follow-up assessments than other participants. The postdischarge durations available for evaluation varied from 3 to 17 years.
Sources of Information in the Medical Record

Chart information used for the retrospective reviews and ratings included present illness, past psychiatric history including each hospitalization and its duration from onset of illness, time spent living in the community, developmental history, social-educational-vocational history, family history, information provided by families and prior psychiatrists, records from prior hospitalizations in other facilities, detailed mental status interviews conducted when the participant first entered the hospital and thereafter, and patient and outpatient progress notes written by psychiatrists, social workers, and occupational therapists. Also included in the case reviews were reports filed by occupational therapists and social workers after visiting participants at their job sites and community residences respectively. It should be noted that, in contrast to practices in mental hospitals of the United States where information is often skimpy regarding psychiatric history and treatment progress, Japanese medical records are unusually thorough, detailed, and rich in descriptions of individuals’ illness histories and course of treatment.

Methods for Case Reviews in Rating 30-Day Intervals

Five psychiatrists and four occupational therapists reviewed each of the 52 participants medical records, using 30-day intervals. Prior to making the ratings, the nine clinicians developed, by consensus, the procedures for evaluating the three outcome measures: social adjustment, number of hospitalizations, and community tenure. These procedures are described below. A 10% sample of ratings for the 30-day intervals that were completed independently by the clinicians showed interrater agreement on all three criteria in excess of 90%.

Social Adjustment. Each participant’s social adjustment was rated for each 30-day period using the Eguma Social Adjustment Scale that has been shown to have psychometrically adequate reliability and validity (Eguma, 1962; Ogawa et al., 1987). The Scale was applied to the chart information available from each 30-day interval for each participant. The Eguma Scale reflects five levels or states of social adjustment ranging from self-supporting to hospitalized. This scale with its operationalized levels of social adjustment is shown in Table 1.

Hospitalizations and Community Tenure. Each hospitalization and its duration for the 52 participants, from onset of illness to the final follow-up point in this study, were rated by the clinicians for the two periods—from onset of illness prior to index discharge and after index discharge from the study hospital. In a like manner, the 30-day intervals were rated for duration of time spent living in the community outside of hospitals, both before and after each participant’s index discharge.

Moderating Variables. Retrospective chart reviews conducted by the research staff yielded information related to age of onset of the schizophrenia, length of time from onset of illness to inception of participant’s enrollment in the hospital’s occupational therapy services, and social adjustment prior to onset of the disorder (i.e., premorbid social functioning). For rating premorbid adjustment, the Premorbid Social Adjustment Scale was employed because of its excellent reliability and predictive validity (Cannon-Spoor, Potkin, Wyatt, 1982).

Attitudes of the family toward the participant, a proxy for family support, were assessed for the period 1 year prior to discharge from hospital. These attitudes were rated dichotomously as “good” if (a) the family visited the partic-

---

Table 1. Eguma Social Adjustment Scale. Decisions for placing a participant in a particular level of social adjustment are based on the individual meeting one or more of the operationalized criteria for that level

<table>
<thead>
<tr>
<th>Level of Social Adjustment</th>
<th>Criteria for Each Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Supportive</td>
<td>Has returned to level of social functioning similar to that prior to onset of illness.</td>
</tr>
<tr>
<td></td>
<td>Maintains independent living and social activities with or without asking for advice from professionals, family, or friends.</td>
</tr>
<tr>
<td></td>
<td>Maintains cordial relations with family members.</td>
</tr>
<tr>
<td>Semi-Self-Supportive</td>
<td>Employed with only occasional lapses and stress at work.</td>
</tr>
<tr>
<td></td>
<td>Maintains a positive attitude toward work with good attendance but requires supervision, guidance, and encouragement.</td>
</tr>
<tr>
<td></td>
<td>Functioning well at home or in supervised residence as reflected by acceptable social interactions, cooperation with others, and maintenance of self-care, personal hygiene, and household duties.</td>
</tr>
<tr>
<td>Socially Adjusted</td>
<td>Works when encouraged with continuous community or family supervision and support.</td>
</tr>
<tr>
<td>Maladjusted</td>
<td>Functions in work, family life, social relations, and community activities when tasks and expectations are limited and simple.</td>
</tr>
<tr>
<td>Hospitalized</td>
<td>Self-care and personal hygiene require frequent prompting and supervision.</td>
</tr>
<tr>
<td></td>
<td>Socially withdrawn and may occasionally display bizarre or inappropriate behavior.</td>
</tr>
<tr>
<td></td>
<td>Not working except intermittently in supervised volunteer or sheltered work.</td>
</tr>
<tr>
<td></td>
<td>Residing in psychiatric hospital requiring frequent or continuous supervision for basic life skills.</td>
</tr>
<tr>
<td></td>
<td>Not engaged in productive occupational therapy.</td>
</tr>
</tbody>
</table>

Eguma, 1962.
participant in the hospital three times or more during the year and (b) assisted the participant personally or financially in moving into his or her new residence or both. If either of these criteria were not met, the family support was rated as "poor."

Less than 5% of the 30-day intervals for all 52 participants lacked sufficient data for making ratings using the Eguma Social Adjustment Scale. Data on all 52 participants were available for the study period. Because the data collected were: (a) retrospective, ending in 1993, (b) used for program evaluation and quality improvement purposes, and (c) coded to maintain confidentiality, the Human Subject Protection Committee waived the need to obtain informed consent.

**Research Hypotheses**

The following hypotheses were developed for the study:

1. The participants’ postdischarge trajectories of social functioning, number of hospitalizations, and periods of community living would be more favorable than those for the predischarge period. This hypothesis reflected the view that completion of the combined (occupational therapy and supported employment) or hybrid vocational rehabilitation program would improve participants’ functioning and protect them from relapses in comparison to the period between onset of illness and discharge into supported employment.

2. Participants who benefited from supportive families would show better outcomes than those with nonsupportive families. This was based on the extensive literature documenting the importance of family relationships and positive involvement on treatment outcome (Falloon, Held, Coverdale, Rocone, & Laidlaw, 1999).

3. Female participants would show better outcomes than males, based on the fact that the onset of schizophrenia among women is, on average, several years later than men. With the symptoms and disability of schizophrenia starting later, women would be expected to have achieved more in educational and social spheres of life which, in turn, provides an advantage in postdischarge adjustment.

4. Poor premorbid social adjustment and longer durations of time between onset of illness and entry into occupational therapy would be negatively related to community tenure.

**Data Analysis**

The *index discharge from the hospital*, which served as the critical transition point for the study design and data analysis, was the first discharge for each participant from his or her initial entry into the study hospital between 1976–1990. Data were analyzed to determine whether completion of occupational therapy and involvement in supported employment yielded significantly greater improvement in social adjustment and reductions in number of days hospitalized during the postdischarge versus predischarge periods. A general multilevel linear trend analysis was applied to the interrupted time–series design to determine whether significant differences were present in outcome variables between the periods of time before and after participants’ discharge into supported employment (Cook & Campbell, 1979; Reise & Duan, 2003).

**Social Adjustment**

Analyses were conducted to determine whether the cumulative effects of hospital-based occupational therapy and community-based supported employment had a greater effect on the social adjustment of participants during the postdischarge period than during their predischarge periods. This was accomplished by applying the linear trend analysis for identifying the average trajectories of change during the two study periods for the 52 participants in the three domains of outcome. In other words, the average trend or trajectory of improvement in the three outcome variables prior to the index discharge was extrapolated into the postdischarge period and compared with the trajectory of improvement in the three variables that actually occurred.

To address the question, “Did the social adjustment of participants improve significantly during the period prior to index discharge from hospital?” the linear trend of social adjustment scores for the 52 participants was computed for the predischarge period using a simple linear correlation; that is, ratings of social adjustment correlated with time. By then calculating the average slope of the 52 trend lines, a judgment could be made as to whether the average participant’s social functioning was improving, diminishing, or remaining the same as a result of hospital-based occupational therapy. The test for this analysis was a simple nonparametric rank sign test (Dixon & Massey, 1983).

By projecting the linear trend from the predischarge period into the postdischarge period, it was possible to compare the *actual* levels of social adjustment for the 52 participants during the postdischarge period with the *expected* levels based on the extrapolation of the linear trend from the predischarge period. This analysis permitted a determination of whether the participants’ social adjustment after being involved in supported employment plus occupational therapy was different from the levels of social adjustment prior to discharge during which time only occupational therapy was available.
The analytic method for detecting time trends was derived from statistical methods developed for field studies (Cook & Campbell, 1979). The analysis was strengthened by virtue of the data having been generated from individuals whose pre- and postdischarge periods occurred at different times, thereby ruling out the possibility that the results were due to some single external event or set of circumstances. As stated by Cook and Campbell (pp. 195–196), “One way to predict the improvement that would occur in the absence of a treatment effect is to measure performance over a number of time periods prior to the start of the treat ment and then extrapolate the observed pattern of improvement into the future. This is the logic behind the interrupted time-series designs. In the simplest such strategy, the pretest scores are regressed onto its time scale and this regression is used to predict the mean posttest response in the absence of a treatment effect.”

The improvement in social adjustment subsequent to discharge and entry into supported employment was further tested by examining the transitions in stages of social adjustment as rated by the Eguma Social Adjustment Scale. As described above and delineated in Table 1, the Eguma Scale has five, graded levels of adjustment ranging from “self-supporting” to “hospitalized.” Separate transition scores were rated for the pre- and postdischarge periods. A transition or change in level or state of social adjustment from one 30-day interval to the immediately following 30-day interval was defined as a shift by one or more levels of the Eguma Scale, either in a positive or negative direction. Ratings were made of transitions for each individual and these were summed to produce the number and type of transitions for the predischarge and postdischarge periods. Using the five levels of social adjustment in the Eguma Scale, a transition matrix was constructed for changes in level for successive 30-day periods before and after each participant’s index discharge. By subtracting the matrix obtained during the predischarge phase from that obtained during the postdischarge phase, a matrix was computed to determine the percent differences in amount and direction of transitions in the respective phases.

Community Tenure and Hospitalized Days

Because the length of time varied for each participant’s periods before and after the index discharge, community tenure was evaluated by comparing each person’s percentage of time spent out of the hospital after the index discharge versus that prior to discharge. Trends in percent of time in any hospitalization before and after participants’ index discharge were compared using methods similar to those described above for social adjustment. Differences in the hospital days between pre- and postdischarge epochs were tested for significance using a general linear mixed-model (DeShon & Morris, 2002). A simple t test for correlated means was used for determining whether number of preversus postdischarge hospital days differed between groups based on the gender of participants and on supportive versus nonsupportive families (Dixon & Massey, 1983).

The risk of rehospitalization was calculated using a fixed effects, partial likelihood method by comparing the time to rehospitalization before and after participants’ index discharge (Allison, 1995). The fixed effects partial likelihood method is a survival analysis for repeated events, such as time spent out of the hospital. This statistical method controls for covariates and is preferred for analyzing nonexperimental data.

Results

The impact of the hybrid occupational therapy and supported employment program was assessed in terms of changes in social adjustment, rehospitalization rates, and community tenure.

Improvements in Social Adjustment

While the linear trend analysis of social adjustment revealed an improving trajectory during the hospital period prior to participants beginning their postdischarge supported employment (p = 0.039), there was a significantly greater improvement in trajectory during the postdischarge period after supported employment was instituted (p = 0.017). That is, the actual trend of improvement in social adjustment after index discharge was significantly greater than that predicted by the extrapolation of the expected improvement based on the average predischarge trend.

In a descriptive analysis of transitions from one level of social adjustment to another, there were 237 state changes (levels) for the two study periods combined. Sixty-one percent of the transitions were favorable; that is, in a positive direction. Matrices were constructed to graphically represent the types and frequencies of transitions for the predischarge and postdischarge periods respectively. Each matrix was formed by five rows and five columns reflecting the five levels of the Eguma Scale. In the matrices, each cell contained the number of transitions from one state to another as determined by the rows and columns. The absolute numbers were converted to percentages of transitions in that cell compared to all transitions in the entire matrix.

When the predischarge matrix is subtracted from the postdischarge matrix, positive differences in percentages to the left of the diagonal indicate a greater number of favorable transitions in the postdischarge period. Negative differences in percentages to the right of the diagonal represent
Table 2. Matrix of Transitions in Social Adjustment (Eguma, 1962). The rows consist of the states or levels of social adjustment that the participant is transitioning from and the columns are the levels of social adjustment that the participant is transitioning to. The matrix is computed by subtracting the predischarge matrix from the postdischarge matrix and yields the differences in social adjustment between the two study periods.

<table>
<thead>
<tr>
<th></th>
<th>Self-Supportive</th>
<th>Semi-Self-Supportive</th>
<th>Socially Adjusted</th>
<th>Maladaptive</th>
<th>Hospitalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Supportive</td>
<td>0</td>
<td>+40.00 %</td>
<td>0</td>
<td>-33.33 %</td>
<td>-06.67 %</td>
</tr>
<tr>
<td>Semi-Self-Supportive</td>
<td>+27.03 %</td>
<td></td>
<td>-03.00 %</td>
<td>-08.71 %</td>
<td>-15.32 %</td>
</tr>
<tr>
<td>Socially Adjusted</td>
<td>+01.85</td>
<td>+24.04 %</td>
<td>-00.15 %</td>
<td>-25.72 %</td>
<td>-25.00 %</td>
</tr>
<tr>
<td>Maladaptive</td>
<td>0</td>
<td>+10.71 %</td>
<td>+14.29 %</td>
<td>-25.00 %</td>
<td>-25.00 %</td>
</tr>
<tr>
<td>Hospitalized</td>
<td>+00.89 %</td>
<td>+24.84 %</td>
<td>+08.33 %</td>
<td>-34.07 %</td>
<td>-25.00 %</td>
</tr>
</tbody>
</table>

a greater number of unfavorable transitions in the predischarge period. As shown in Table 2, if percentage differences of 10% or greater are viewed as significant, 11 of the possible 20 reveal more favorable transitions in the postdischarge versus predischarge periods with only one of 20 favoring the predischarge period. If a threshold of 5% or more in difference scores is used, 13 of 20 possible transitions favor the postdischarge period and only one favors the predischarge period.

Rehospitalizations

The fixed effects partial likelihood, survival analysis revealed that the time to rehospitalization was longer in the postdischarge phase, reducing the risk of rehospitalization by 50.7% compared to the period of time from onset of illness to the index discharge \([\chi^2 (1) = 16.4, p = 0.0001]\). The mean number of hospitalizations before the index discharge was 3.19 \((SD = 1.67)\) and after discharge, 1.48 \((SD = 1.61)\). Nineteen of the 52 participants, or 36.7%, were not rehospitalized during their participation in supported employment subsequent to the index discharge. The remaining 33 participants were rehospitalized a total of 77 times, or an average of 2.33 per participant, during the postdischarge phase. For these 33 participants, the time between discharge into supported employment and first rehospitalization ranged from 3 months to 12 years, averaging 2.94 years.

Community Tenure

Community tenure, or the percentage of time spent outside the hospital, increased significantly after index discharge. For example, the time that participants spent out of the hospital increased from 54.4% during the predischarge period to 67.9% in the postdischarge phase \([F(1, 48) = 4.57, p = 0.038]\). Female gender and supportive family attitudes were associated with more time spent out of the hospital subsequent to index discharge and entry into supported employment. Thus, after job placement, women spent an average of 91% \((SD = 0.16)\) of their time out of the hospital in the community, compared to 57% \((SD = 0.40)\) for men \([t(50) = -4.35, p = 0.001]\). When these data were analyzed, controlling for family attitudes and time spent out of the hospital before the index discharge, the gender effects were significant \((p = 0.0001)\).

Participants whose family members were rated as having positive and supportive attitudes toward their mentally ill relative spent more time in the community \((Mean = 89.6%, SD = 9.5\%\) than participants whose families were rated as nonsupportive \((M = 61.4\%, SD = 6.2\%)\), differences that were statistically significant \([t(50) = 3.33, p = 0.002]\). When these data were analyzed controlling for gender and time spent out of the hospital in the period prior to index discharge, the beneficial value of supportive families was even more statistically significant \((p = .0001)\).

Two other variables that were hypothesized to moderate community tenure were premorbid social adjustment and duration of time from illness onset to entry into the occupational therapy component of the rehabilitation program. Each of the three variables was split at the median and a chi-square test was performed to determine the significance of the various relationships. The length of time from the onset of illness to the beginning of occupational therapy was inversely related to community tenure at a statistically significant level \([\chi^2 (df = 1) p = 0.028]\). That is, the longer individuals’ disorders lasted before entering occupational therapy in the hospital, the shorter was their subsequent community tenure. Similarly, higher levels of premorbid social adjustment predicted longer periods of living in the community \([\chi^2 (df = 1) p = 0.011]\).

Case Report

Specific examples of how the vocational rehabilitation program affected individual participants can give another type of validation to the impact of the program. Although statistics provide a quantitative measure of a program’s impact, they are limited by virtue of using means and standard deviations of the entire sample. Treatment and rehabilitation programs customarily have differential effects based on variations among individuals; thus, case examples can supple-
This case report shows that involvement in occupational therapy prepared Mr. I. for competitive employment which, in turn, provided motivation and income to move into the community. His two subsequent relapses and rehospitalizations were brief and the continuing contacts and support from his occupational therapist enabled him to return to his job.

Discussion

In this evaluation of a hybrid vocational rehabilitation program, refined in stages over a period of years by occupational therapists, an unselected group of persons with schizophrenia showed significant improvement in social adjustment and community tenure after participating in both hospital-based occupational therapy and community-based supported employment. Participants served as their own controls in a design that replicated, with each of the 52 participants, their before and after experiences relative to their index discharge. It should be understood that the trajectory of improvements after index discharge reflected the combined impact of hospital-based occupational therapy and postdischarge supported employment. Because combined rehabilitation modalities are the rule rather than the exception, the evaluation can be viewed as more closely reflecting the exigencies of customary rehabilitation services provided to unselected participants in nonresearch settings. In contradistinction, a highly controlled, time-limited, experimental efficacy study in which participants are highly selected and the intervention is carried out by specially trained research workers has less generalizability to real-world, clinical settings.

On the other hand, without a more controlled, experimental design it is not possible to identify which of the components of the participants’ treatment and rehabilitation were the active ingredients responsible for beneficial outcomes. The case study suggests that adherence to antipsychotic medication may be important in promoting favorable social, vocational, and community functioning. However, it is possible that consistent use of medication was mediated by duration of participation in occupational therapy prior to discharge from the hospital, positive family attitudes toward the use of medication, and education of participants about the benefits of medication provided by their psychiatrists. Recent studies, including those from Japan and China, suggest that organized and systematic training of persons with schizophrenia and their family members in medication self-management skills results in improved medication compliance, reduced relapse, and better social functioning (Anzai et al., 2002; Falloon et al., 1999; Kopelowicz, Zarate, Smith, Mintz, & Liberman, 1999; Kopelowicz, Zarate, Smith, Mintz, & Liberman,
Conclusion

Although the results of this study provide evidence for the value of a multicomponent vocational rehabilitation program at a hospital in Japan, more conclusive cause and effect relationships between the interventions and participants’ outcomes must await the completion of controlled, randomized, and proactive research designs. However, the results of this study point to the importance of an interdisciplinary and sustained effort in vocational rehabilitation and continuity of care from the hospital to community in promoting favorable, long-term clinical benefits for participants with schizophrenia. The key role of cooperation among occupational therapists and other disciplines in the psychiatric treatment team, community-based employers, supportive families, and the participants themselves demonstrates the potentially empowering impact of work on rehabilitative outcomes.

References


---

**eLetters**

AJOT now publishes Letters to the Editor online only. This new feature called eLetters can be accessed through AJOT online by going to the AOTA Web site at www.aota.org, and clicking AJOT Online, then eLetters on the AJOT home page.

See the July/August AJOT online issue for Letters to the Editor in response to the Oka et al. article in this issue and the Koziatek and Powell article in the May/June 2003 issue.