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Reducing Emergency Medical Service Use in Patients with Chronic Psychotic Disorders: Results from the FAST Intervention Study

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Abstract

Patients with schizophrenia have disproportionately high rates of emergency medical service use, likely contributing to the high cost this illness places on society. The aim of this study was to examine the impact of a theory-based, behavioral intervention on immediate and long-term use of emergency medical services. Older patients with schizophrenia (N=240) were randomized to receive either a behavioral, skills-building intervention known as Functional Adaptation and Skills Training (FAST) or to a time equivalent attention-control condition (AC). Logistic regression analyses indicated that AC participants were nearly twice as likely to use emergency medical services in general (OR = 2.54; p = 0.02) and emergency psychiatric services in particular (OR = 3.69; p = .05) during the active intervention phase of the study. However, there were no differences between the interventions in terms of emergency service use during the long-term follow-up phase of the study (i.e., 6-months to 18-months post-baseline). The FAST intervention appears efficacious for reducing short-term risk of using emergency medical services. However, the long-term efficacy of the FAST intervention appears less clear. Future studies may want to provide more powerful maintenance sessions to encourage continued use of skills in patients' real-world settings.

Keywords

Schizophrenia; Treatment; Behavior Therapy; Social Cognitive Theory; Efficacy

Introduction

Persons with schizophrenia or other psychotic disorders have relatively high rates of emergency psychiatric and non-psychiatric medical service use (Carr et al., 2003; Ellison, Blum, & Barsky, 1986) and suicide (Radomsky, Haas, Mann, & Sweeney, 1999). For example, although the lifetime prevalence of schizophrenia and schizophrenic disorders in the population is only about 0.5%–1.5% (American Psychiatric Association, 2000; Goldner, Hsu, Waraich, & Somers, 2002), patients with schizophrenia average more than twice the number of visits to general practitioners as those without a mental disorder (Carr et al., 2003). Approximately 28%

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of “high users” of acute psychiatric inpatient services carry a schizophrenia diagnosis (Surber et al., 1987). Almost half of all patients with schizophrenia are admitted to an inpatient psychiatric facility in any given 12-month period, and use of emergency medical services among those with schizophrenia exceeds that of other mental illnesses (Carr et al., 2003). These factors likely contribute to the disproportionate cost that schizophrenia places on society (Wyatt, Henter, Leary, & Taylor, 1995). Medical care designed to reduce utilization of these services is needed, not just for economic reasons but to improve well-being and promote recovery in those with psychotic illnesses. One means of preventing excessive service use is to provide psychosocial interventions that teach skills necessary to manage life tasks.

Examination of the impact of psychosocial treatments on relapse and emergency service use is not new. Perhaps the most researched treatment modality for emergency service use has been Assertiveness Community Treatment (ACT). Relative to treatment as usual, ACT has been noted to significantly reduce patient risk for hospital admissions and length of stay, but evidence that ACT significantly improves other important areas of functioning, including social and everyday functioning and cost of care, appears lacking (Ziguras & Stuart, 2000). Therefore, it appears that interventions which significantly improve everyday functional skills might simultaneously reduce emergency service use. In turn, achieving both of these outcomes would be highly desirable for patients and families, healthcare providers, and society in terms of quality of well-being and cost.

Between 1990 and 2020, the number of people 45 years of age or over in the USA will have increased by 73% compared to only 11% by individuals under 45 years (Cheeseman, 1996). One common misconception is that various psychiatric illnesses including schizophrenia are much less common in older than in younger adults. However, a national consensus statement concluded that the number of older psychiatric patients are not only much higher than is generally believed but also are going to increase to a greater extent than the aging population at large (Jeste et al., 1999). One explanation for this aging trend is that expected improvements in treatments for this population will result in increased longevity. However, without concerted efforts to enhance the use of evidence-based interventions and to ensure adequate access to quality care for middle-aged and older patients, this increased longevity may not result in improved quality of life or reduced disability.

Despite the emergence of an aging trend, nearly 90% of manuscripts published on schizophrenia have excluded elderly participants (Jeste & Nasrallah, 2003). This is relevant given important differences between younger and older individuals with schizophrenia. For example, compared to their younger counterparts, a greater proportion of middle-aged and elderly persons with schizophrenia are female and have ever been married and employed (Jeste et al., 1995). Older patients are also likely to have a higher prevalence of depressive symptoms (Zisook et al., 1999). In sum, the combined impact of an aging trend and unique demographic and health characteristics highlight the importance of investigating interventions specific to this population.

We previously reported on the efficacy of a behavioral skills training intervention, known as Functional Adaptation and Skills Training (FAST), for improving functional skills in middle-aged and older patients with schizophrenia (Patterson et al., 2006). In our previous report, patients in the FAST intervention showed significant improvements in social skills and everyday functional skills relative to an attention-control (AC) condition. Through promoting every day living skills, patients were also expected to have reduced need for emergency medical services, thereby minimizing burden on health care systems. The purpose of the present manuscript was to investigate the efficacy of the FAST intervention for reducing risk for emergency service use. We hypothesized that participants randomized to the FAST condition

would be less likely to utilize emergency services both during the 6-month intervention and the 1-year following the intervention.

Methods

Participants

Two hundred forty middle-aged and older patients with a chart diagnosis of schizophrenia or schizoaffective disorder were recruited into this study. All participants in the FAST study were well-managed on psychotropic medication(s). Participants were recruited from Board and Care (B&C) facilities, community-based clinics specializing in treatment of serious mental illness, and other residential care facilities (e.g., client-run clubhouses) in San Diego County, CA. Participants were paid $10 for completing each of the four assessments. More information about participants and recruitment can be found in our primary outcome paper (Patterson et al., 2006). The FAST project was approved by the UCSD Institutional Review Board (IRB) and all participants provided written informed consent.

Measures

All participants were administered the Cornell Service Index (CSI) (Sirey et al., 2005), which assesses patient utilization of a number of different health services (e.g., outpatient medical, intensive services). For each service, frequency and duration of use over the past 90 days was recorded, as was the reason for the service being used (e.g., physical problem, mental health problem). Previous literature indicates that persons with schizophrenia can provide reliable information about their use of health services, even up to 6-month recall (Goldberg, Seybolt, & Lehman, 2002). Because the present study focused on “emergency” service utilization, the following 4 items from the *Intensive Services* subscale were used: a) emergency room visit, b) crisis team visit, c) partial hospitalization program, and d) inpatient hospitalization. Because use of multiple services and repeated use was rare in this study, a dummy coded variable was created (0 = “No”, 1 = “Yes”) to indicate whether or not patients had used any of these services over the previous 90 days.

Symptoms of psychosis were assessed using the Positive and Negative Syndrome Scale (PANSS) (Kay, Fiszbein, & Opler, 1987), depressive symptoms were assessed using the 17-item Hamilton Rating Scale for Depression (HRSD) (Hamilton, 1969), and overall cognitive performance was assessed using Mattis’ Dementia Rating Scale (DRS) (Mattis, 1973).

Intervention Conditions

Descriptions of our FAST and AC conditions are described in greater detail elsewhere (Patterson et al., 2006; Patterson et al., 2003). Briefly, the FAST intervention was 24 weekly group-based sessions. Each class lasted 120 minutes, and participants were taught everyday functional skills (e.g., medication management, social skills). Each group was co-led by two master’s or bachelor’s level counselors.

The AC condition was time-equivalent, group-based, and was co-led by 2 counselors with similar training as those providing the FAST intervention. The structure of the group was similar to that of community-based support groups, in which participants openly discussed problems that were important to them, and other group members offered suggestions and support in managing these issues. Counselors facilitated discussion but did not offer suggestions on managing problems, except in the case of a crisis. The AC condition also received 24 weekly group sessions followed by 6 monthly booster sessions.

Procedure

Participants were assessed 4 times over the course of the 18-month study period. The first assessment occurred prior to participating in the intervention. Following the baseline assessment, participants were randomized to receive either the FAST or the AC condition. Randomization followed a three-step process. First, care facilities were identified and we randomly selected the order in which facilities were approached. Second, we screened and identified patients who meet basic study criteria. Third, once 8 eligible and interested participants were identified, they were randomly assigned to receive treatment (FAST) or control (Support). Randomization to treatment or control was conducted using a table of random numbers by a statistician who was "blind" to all other patient variables and who was not involved in treatment or data collection.

The intensive phase of the intervention occurred over a 6-month period, after which participants completed their first follow-up assessment (henceforth called 6-month). Following this intensive intervention phase, participants in both intervention conditions received monthly booster sessions (n = 6) which emphasized continued practice and application of material learned during the active intervention phase. Following boosters, all participants received a 12-month post-baseline assessment. The final assessment occurred at 18-months post-baseline.

Data Analysis

Our analytic plan was to assess whether participants in the FAST intervention were less likely than AC participants to utilize emergency services: a) during the active intervention phase (i.e., baseline to 6-months), and b) during the 12 months following the active intervention (i.e., 6-months to 18-months post-baseline). To assess the efficacy of the FAST intervention for reducing the use of emergency service during the active intervention phase, we conducted a logistic regression analysis with post-treatment (6-month) service use (1=yes, 0=no) as our outcome and intervention condition as our primary independent variable.

Extant literature suggests that ethnicity (Husaini et al., 2002), gender (Grossman, Harrow, Rosen, & Faull, 2006), high levels of psychiatric symptoms (Clarke et al., 2000), depression (Johnson, 1988), increased cognitive impairment (Lysaker, Bell, Bioty, & Zito, 1996), and younger age (Jin et al., 2003) may be associated with emergency service use. Baseline values for these factors were therefore entered into the model. Baseline service use (1=yes, 0 = no) was also entered as a covariate because participants with service use prior to the intervention are potentially more likely to continue using these services. All linear predictor variables were centered at their means and all binary variables were contrast coded as +0.5 and −0.5 (Kraemer & Blasey, 2004). Finally, we report odds ratios (OR) to facilitate interpretation of our results.

To examine the maintenance of gains made during the intervention, we conducted a second logistic regression analysis. In this analysis, any use of emergency services during the 12-months following the intervention was our dependent variable. We used the same independent variables as our first analysis, except that values were from the 6-month assessment rather than baseline values. Our primary variable of interest was intervention condition.

We first analyzed data using intent-to-treat principals (i.e., last observation carried forward) and conducted a second analysis using only available data. Further, following our initial logistic regressions, we conducted two additional logistic regressions predicting use of emergency services for psychiatric/mental health reasons and those for other (non-psychiatric) medical reasons. As with our primary analysis, intervention condition (i.e., FAST vs. AC) was our main predictor variable, and all covariates listed above were entered into the model.

Results

Case Dropouts

Participant flow through the study is presented in Figure 1. Of the 240 total participants, 12 failed to adequately complete all baseline measures and were therefore excluded from this study. Five of these 12 participants (41.7%) were from the FAST intervention and 7 (58.3%) were from the Control condition ($\chi^2 = 0.51$, df = 1, p = .48). The 12 participants who failed to complete baseline measures were significantly more likely to be male ($\chi^2 = 3.95$, df = 1, p = .047) than the remaining 228 participants. However, no other significant differences were observed on any other available demographic or health characteristics (all p-values > .37).

Of the 228 remaining participants, 119 were in the FAST intervention and 109 were in the AC condition. No baseline demographic or health differences were observed between those in the FAST and Control conditions (see Table 1). Average sessions attended for the FAST (mean = 12.23 ± 8.63) and AC conditions (mean = 11.72 ± 7.50) were not significantly different (t = 0.48, df = 226, p = .635).

A total of 27 participants (11.8%) dropped out of the study during the active intervention phase. Seventeen (63%) of these were from the FAST condition and 10 (37%) were from the Control condition ($\chi^2 = 1.42$, df = 1, p = .23). Those who dropped out of the study were significantly younger (M = 49.9 ± 7.0) than those who did not (M = 53.0 ± 7.5), but did not significantly differ on any other variables (all p-values > .05). An additional 6 participants (FAST = 3; Control = 3) were missing 6-month data on their use of emergency services (but did not drop out of the study). These participants did not differ on any demographic or clinical characteristics (all p-values > .05), suggesting these data were missing at random.

Of the 201 active participants at the 6-month (post-intervention) assessment, 31 (15.4%) dropped out of the study during the 1-year post-intervention follow-up phase. The 31 participants who dropped out during the follow-up phase were not significantly different than those who remained in the study on any demographic characteristics (all p-values > .05). However, dropouts had significantly more 6-month (i.e., post-intervention) symptoms of psychosis than non-dropouts (t = 3.65, df = 194; p < .001).

Predictors of Any Emergency Service Use – Intensive Treatment Phase

Using intent-to-treat principals (i.e., last observation carried forward), a total of 42 participants were classified as having used any emergency medical service during the active treatment phase (FAST = 14, AC = 28). Logistic regression indicated that AC participants were significantly more likely to have used emergency medical services than FAST participants (B = 0.89 ± 0.39, df = 1; p = .02). AC participants were over twice as likely to use emergency services as FAST participants (OR = 2.43). Baseline emergency service use was the only significant covariate in the model (B = 1.54 ± 0.42, df = 1; p < .001).

Our secondary analysis used all available data—By this criteria, a total of 37 participants utilized emergency services (FAST = 12, AC = 25) during the active intervention phase (i.e., baseline to post-intervention). Table 2 shows odds ratios (OR) and 95% confidence intervals (CI) for each predictor of 6-month (post-intervention) emergency service use. As predicted, relative to FAST participants, those randomized to the AC condition were significantly more likely to use any emergency service during the active phase of the intervention (B = 0.93 ± 0.41, df = 1, p = .02; OR = 2.54). Participants who used services in the 90 days prior to enrollment were significantly more likely to use emergency services during the study (B = 0.93 ± 0.46, df = 1; p = .04). No other variables in the model were significant.

Predictors of Emergency Services – Follow-up (Maintenance) Phase

Our second set of analyses examined intervention differences in emergency service use during the year following the active intervention. In our intent-to-treat analysis, a total of 78 participants (FAST = 37, AC = 41) used emergency services during the maintenance phase. No significant difference was observed in service use between FAST and AC participants (B = −0.19 ± 0.33, df = 1, p = .561). Using only available data, a total of 66 participants (FAST = 33, AC = 33) used emergency services during the maintenance phase, with results similar to those of the intent-to-treat model (B = −0.05 ± 0.37, df = 1, p = .888). In the overall model age (B = −0.08 ± 0.03, df = 1, p = .005), Caucasian ethnicity (B = 0.89 ± 0.37, df = 1, p = .016), and 6-month service use (B = 1.28 ± 0.49, df = 1, p = .010) (data presented are from the model using available participants) emerged as significant predictors of follow-up emergency service use.

Secondary Analyses

Our next analysis examined likelihood that participants in the AC condition used emergency services for psychiatric reasons relative to those in the FAST intervention. In our intent-to-treat analysis, 20 participants (FAST = 6, AC = 14) were considered users of emergency psychiatric services during the active treatment phase. Intervention condition was not a significant predictor of use of emergency psychiatric services (B = 0.92 ± 0.56, df = 1, p = .098). The odds ratio (95% CI) for intervention condition was 2.51 (0.84–7.48). With the exception of baseline emergency service use (OR = 8.09, 95% CI = 2.58–25.34), no other covariates were significant.

In our analysis of all available participants, 17 (FAST = 4, AC = 13) used emergency psychiatric services by the 6-month assessment. Results of our logistic regression indicated that AC participants were significantly more likely to use emergency psychiatric services relative to FAST participants (B = 1.31 ± 0.65, df = 1, p = .05) (see Table 3). Participants who used emergency psychiatric services prior to the intervention were also more likely to use them during the intervention (B = 1.39 ± 0.66, df = 1, p = .04; OR = 3.69). Interestingly, age was significantly associated with likelihood of using emergency psychiatric services (B = −0.10 ± 0.05, df = 1, p = .04). No other variables were significantly associated with immediate post-intervention emergency psychiatric service use.

During the long-term follow-up phase, 29 participants (FAST = 14, AC = 15) used emergency psychiatric services. No significant differences were observed for intervention condition (B = −0.43 ± 0.49, df = 1, p = .377). Age (B = −0.11 ± 0.04, df = 1, p = .006) and 6-month emergency psychiatric service use (B = 2.42 ± 0.64, df = 1, p < .001) also predicted emergency psychiatric service use during the year following the intervention.

Finally, we examined the use of emergency services for non-psychiatric reasons. Overall, 20 participants (FAST = 8, AC = 12) used non-psychiatric emergency services during the active intervention phase. No service use differences were observed between the FAST and AC conditions (B = 0.60 ± 0.51, df = 1, p = .238), and no other predictors in the model were significant.

Discussion

This study demonstrates the short-term efficacy of a behavioral skills training intervention for reducing emergency service use in patients with schizophrenia. Specifically, during the active intervention phase of this study, the probability that AC patients used emergency medical services was approximately twice that of FAST participants. These findings complement the existing evidence that the FAST intervention can successfully increase functioning in this

population; most notably by demonstrating that the intervention had meaningful results on "real-world" outcomes such as emergency service utilization.

Reduced service utilization does not necessarily indicate reduced *need* for services, and we therefore urge caution in interpreting these results as such. For example, some patients may genuinely need emergency services but choose not to use them. Under these circumstances, lower service utilization would be considered undesirable. However, there is no reason to believe that the FAST intervention would inhibit patient motivation to use emergency services relative to AC intervention. Furthermore, the conclusion that the FAST intervention reduced genuine service need is bolstered by the fact that all patients in our study were in monitored and stable living situations (e.g., B&C facility, with someone in a house or apartment), in which a confidant could monitor patient health and psychiatric functioning and therefore help ensure a person received emergency care when it was deemed necessary.

Participants in this study were asked to report their use of emergency services over the previous 90 days (approximately 3 months). Although literature suggests patients with schizophrenia can reliably report their use of health services, including 6-month recall (Goldberg et al., 2002), this 90-day period was half the length of our intervention (6-months). Thus, it is not clear how many participants from the FAST and control conditions used emergency services during the first 3-months of the intervention. However, information on service use during the latter 90 days of the intervention is arguably more valuable because the intervention, particularly a skills-based intervention like FAST, is likely to require an adequate "dose" for patients to acquire and master the requisite skills before an effect is observed. Nonetheless, more research on the effect of this intervention on service use over the entire 6-month intervention period is needed.

We did not see long-term benefits favoring the FAST intervention. There may be several reasons for this lack of significant findings. First, although participants in the FAST intervention showed significant improvement in functional capacity relative to control participants (Patterson et al., 2006), they may not have continued using their skills once the intervention was completed. During the active intervention phase, FAST participants were required to practice skills learned in the group and report on their experiences during the following group sessions. Accountability therefore typically came from group leaders and other patients within the group. Although participants received boosters following the active intervention, these occurred only once per month, and this may not be enough to ensure adequate maintenance and practice of skills. Therefore, greater frequency of booster sessions (e.g., twice monthly or greater) may be required to ensure maintained practice and mastery of skills beyond the active intervention phase. However, full-length, face-to-face booster sessions may not be required. Rather, clinicians may wish to use telephone contacts: 1) to reinforce knowledge of skills and continued practice of skills outside of the classroom setting, 2) to problem-solve barriers to continued practice of skills, and 3) to offer support and answer questions relevant to the patient. If efficacious, the use of telephone rather than face-to-face boosters may provide an added financial benefit in terms of reduced travel time and reduced session time (e.g., 10–15 minutes). Researchers should also work to develop more frequent or better follow-up (booster) sessions, or should examine the impact of greater accountability during the post-intervention follow-up phase.

Another limitation was that we did not include health economic analyses with regard to service utilization data. These data would help bolster the impact of the FAST intervention to include financial benefit to the patients' communities. However, as mentioned above, most of our participants were residing in communities with adequate access to care (e.g., board and cares in San Diego, CA), which strengthens the argument that patients could have used the services if it was necessary. Nevertheless, the financial benefit of the FAST intervention may be

negligible in populations not well monitored (e.g., homeless) or in communities that lack access to services. Therefore, we strongly encourage future studies to include health economic analyses and to examine the generalizability of these effects to other populations and communities.

Our study did not include assessment of alcohol or other substance abuse, which is known to predict re-hospitalization and emergency service use in this population (Olfson et al., 1999; Osher et al., 1994). While randomization to conditions suggests this factor should not influence group differences, future studies should consider alcohol and substance use as potential modifying factors.

Overall, we found that a behavioral skills-building intervention was associated with significant short-term reductions in overall emergency service use in a sample of middle-aged and older patients with schizophrenia. The intervention's effect was particularly strong in reducing emergency psychiatric service use. However, long-term benefits of the intervention for this outcome appeared weaker, possibly due to infrequent (i.e., monthly) booster sessions, which may have contributed to participants' failure to continue practicing and using skills in their natural environments. More research is needed examining stronger, more powerful methods of patient follow-up, particularly after the active intervention phase.

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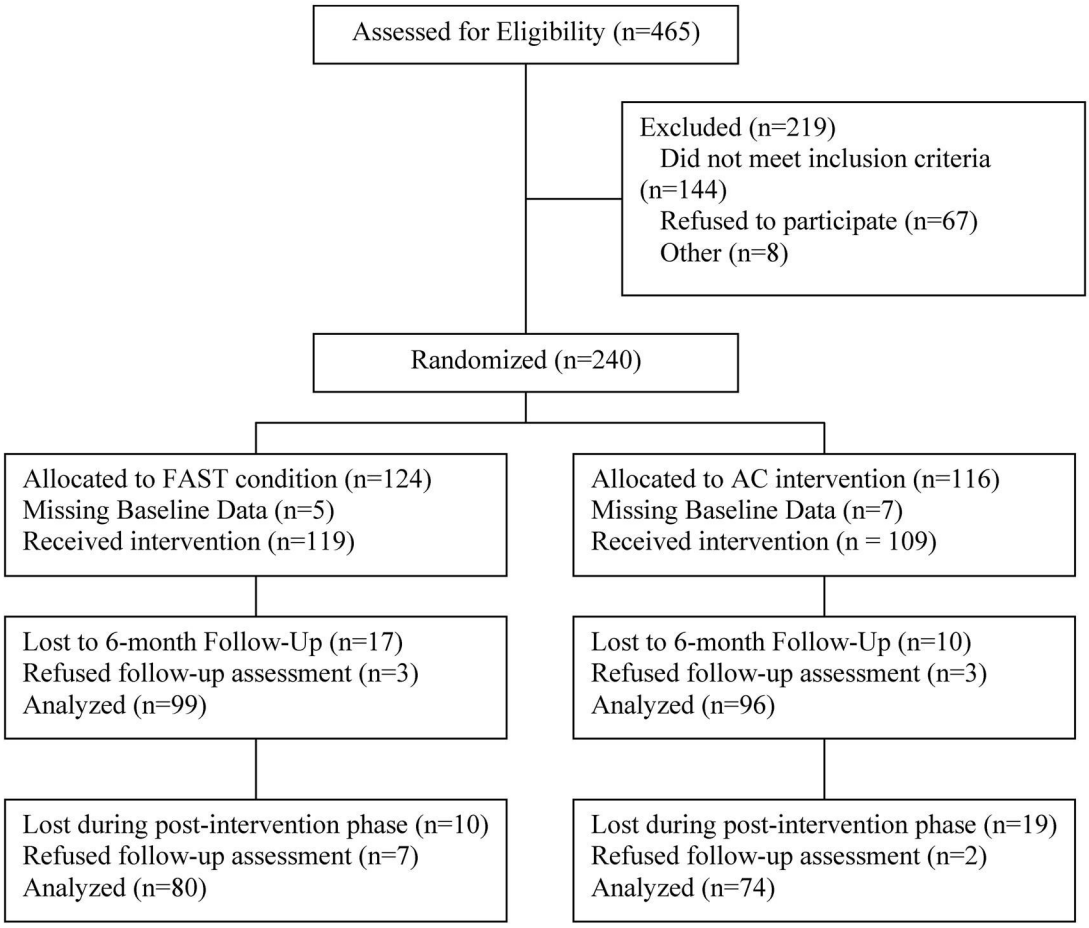

Figure 1.
Participant flow through the study.

Table 1

Demographic and health characteristics of intervention conditions

Variable	FAST Intervention (n = 119)	Control Intervention (n = 109)	t-test	χ^2	p-value
Age, M (SD)	53.0 (7.8)	52.2 (7.1)	0.79		.43
Education (years), M (SD)	11.6 (2.8)	11.7 (2.6)	−0.09		.93
Female, n (%)	47 (39.5)	36 (33.0)		1.03	.31
Caucasian, n (%)	61 (51.3)	59 (54.1)		0.19	.67
Schizoaffective, n (%)*	23 (19.3)	20 (18.5)		0.02	.88
Daily neuroleptic dose[a], M (SD)	462.3 (497.2)	424.7 (394.6)	0.59		.56
Any emergency service use, n (%)	18 (15.1)	20 (18.3)		0.43	.51
Emergency Psychiatric use*, n (%)	11 (9.3)	13 (11.9)		0.41	.52
PANSS Total, M (SD)	58.4 (15.3)	62.3 (17.2)	−1.85		.07
HAMD Total, M (SD)	10.3 (7.4)	10.4 (6.8)	−0.08		.94
DRS Total, M (SD)	125.2 (13.0)	125.4 (15.0)	−0.09		.93

*n = 227.

[a]Daily Neuroleptic Dose (n = 206) is reported as mg chlorpromazine equivalent (Jeste & Wyatt, 1982; Woods, 2003).

Table 2

Risk ratio and 95% CI for using any emergency service at 6-month assessment

Variable	OR	95% CI	Wald	p-value
Age	0.99	0.93 – 1.04	0.27	.61
Caucasian	0.93	0.43 – 2.03	0.03	.86
Female	1.16	0.52 – 2.59	0.13	.72
DRS Total	0.99	0.97 – 1.02	0.26	.61
HAMD	1.02	0.95 – 1.09	0.23	.63
PANSS Total	1.03	0.99 – 1.06	2.25	.13
Baseline Emergency	2.54	1.02 – 6.30	4.05	.04
Control Condition	2.54	1.14 – 5.66	5.22	.02

Note. OR = Odds Ratio; DRS = Dementia Rating Scale; HAMD = Hamilton Depression Rating Scale; PANSS = Positive and Negative Syndrome Scale; IMED = Interim Medical History; FAST = Functional Adaptation and Skills Training.

Table 3

Risk ratio and 95% CI for using any emergency psychiatric service at 6-month assessment

Variable	OR	95% CI	Wald	p-value
Age	0.91	0.83 – 0.99	4.41	.04
Caucasian	0.65	0.21 – 2.01	0.57	.45
Female	1.44	0.45 – 4.57	0.37	.54
DRS Total	1.01	0.97 – 1.05	0.11	.75
HAMD	0.95	0.84 – 1.06	0.90	.34
PANSS Total	1.05	1.00 – 1.10	3.42	.06
Baseline Emergency	3.99	1.09 – 14.63	4.37	.04
Control Condition	3.69	1.03 – 13.24	4.02	.05

Note. OR = Odds Ratio; CI = Confidence Interval; DRS = Dementia Rating Scale; HAMD = Hamilton Depression Rating Scale; PANSS = Positive and Negative Syndrome Scale; IMED = Interim Medical History; FAST = Functional Adaptation and Skills Training.