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The Impact of Critical Time Intervention in Reducing Psychiatric Re-Hospitalization Following Hospital Discharge

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Abstract

Objectives—This study examines the impact of Critical Time Intervention (CTI) in reducing re-hospitalization among formerly homeless individuals with severe mental illness following discharge from inpatient psychiatric treatment.

Methods—CTI is a nine-month care coordination intervention designed to support persons with severe mental illness in the transition from institutions to community living. Following discharge from inpatient psychiatric treatment, 150 previously homeless men and women were randomly assigned to receive either usual services only or CTI in addition to usual services. Study participants were assessed every six weeks for 18 months after entering the community.

Results—At the end of the follow-up period, psychiatric re-hospitalization was significantly lower for the group assigned to CTI compared with the usual services group (OR=.11, 95% CI=.01–.96).

Conclusion—This study demonstrates that CTI, primarily designed to prevent recurrent homelessness, also reduces the occurrence of re-hospitalization following discharge.

Re-hospitalization following hospital discharge is a common and troubling outcome for persons with severe mental illness (1,2) including those with a history of homelessness (3). One cause is thought to be the difficulty in accessing needed treatment and support during post-discharge period, a problem exacerbated by complex and fragmented systems of community care (4). This transition period is often stressful, especially for formerly homeless persons seeking to establish residential stability in addition to meaningful connections to sources of treatment and support in the community. Critical Time Intervention (CTI) is a time-limited care coordination intervention, shown to reduce recurrent homelessness in this population following discharge from shelters (5) and psychiatric hospitals (6). This study examines the impact of CTI on occurrences of psychiatric re-hospitalization among 150 previously homeless individuals with severe

Disclosures

The authors report no competing interests.

mental illness following discharge from inpatient treatment at two large state-operated hospitals.

Methods

This study utilizes data from a randomized controlled trial (6) that assessed the efficacy of CTI in preventing homelessness following hospital discharge. Participants were recruited between 2002 and 2006 from transitional residences located at two state operated psychiatric hospitals in the New York City area to which most inpatients with housing difficulties were referred pending discharge to the community. The inclusion criteria of the study were the following: DSM-IV diagnosis of psychotic disorder, history of homelessness, living in a transitional residence between 2002 and 2006 and planned residency in NYC following discharge from transitional residences. The exclusion criteria were individuals who did not speak English, did not stay in a transitional residence for more than three week nights and were unable to provide informed consent. Participants who met criteria were provided with a complete description of the study and written informed consent was obtained. Of the 150 participants, 73 participants (49%) were randomly assigned to receive usual services only while 77 participants (51%) were assigned to receive CTI in addition to usual services. Further details regarding randomization and study attrition are described in the main study (6). The Columbia University IRB approved the study.

All participants received access to psychiatric treatment and discharge planning services prior to leaving transitional residences. Post-discharge housing arrangements varied from structured residences to independent housing, with some participants refusing housing assistance and returning to streets or shelters. CTI workers were not involved in the determination of initial housing arrangements. Following discharge, those assigned to the usual services only group received access to various community-based services while participants assigned to the experimental condition received these services plus CTI.

CTI aims to prevent recurrent homelessness and other adverse outcomes by strengthening the individual's long-term ties to services, family, and friends and by providing direct emotional and practical support via a CTI worker during the transition period. Contact between the CTI worker and the service recipient is time-limited, gradually decreasing in a planned way over time. This is intended to mobilize resources in the participant's support network and encourage eventual transfer of responsibility for providing long-term support to community resources. CTI was delivered by a trained social service worker who aimed to establish a relationship with the participant before the participant left the transitional residence. The intervention was delivered for nine months post-discharge. Further details of the model are described in previous publications (5,6,7).

Psychiatric re-hospitalization was assessed via participant self-report in follow-up interviews conducted every six weeks over 18 months by research interviewers blind to treatment condition. Psychiatric hospitalization was defined as an overnight stay in either a psychiatric unit in a general hospital, psychiatric hospital or psychiatric emergency room. As in our previous report (6), we focused on the last three observation intervals to assess the enduring

effect of the intervention. Prior to discharge from the transitional residence, we collected baseline data including demographics, diagnosis, and past psychiatric hospital admissions.

We used random effects logistic regression to assess the intent-to-treat effect of CTI, testing between-groups difference in the occurrence of psychiatric hospitalization during the last three follow-up intervals. We adjusted for baseline covariates (gender, age, race, mental illness diagnosis, marital status, education, substance use disorder, number of children, and total psychiatric hospitalization nights 90 days before the index hospital admission) and housing stability. We included housing stability in the model as a potential confounder (operationalized as the number of days out of the 24-week period between end of the intervention and the beginning of the final three observation intervals that the participant resided in his or her own home, apartment or rooming house) because previous research shows that it is associated with re-hospitalization risk (8). A dichotomous measure of psychiatric re-hospitalization was used due to its highly skewed distribution. We also tested for group differences in the proportion of participants who experienced at least one night of psychiatric re-hospitalization and the median number of nights hospitalized during the same period, using a *k*-sample equality-of-medians test (9). The data were analyzed using STATA version 11.

Results

107 (71%) of participants were male and the mean $\pm$ SD age was 37.5 $\pm$ 9.5 years. There were 93 African-Americans (62%). 92 (61%) participants had a lifetime diagnosis of schizophrenia and 52 (35%) had diagnoses of schizoaffective disorder. 135 (90%) participants met criteria for either substance use or dependence.

Assignment to CTI was significantly associated with a reduced odds of re-hospitalization during the final three observation intervals (OR=.11, 95% CI=.01–.96). The usual services and CTI groups had a total of 1508 and 1183 psychiatric re-hospitalization nights respectively during the final three intervals, with both the proportion (27% vs. 18%, $z = 2.09$, $p < .05$) and frequency of re-hospitalization nights above median (49 vs. 31, $\chi^2 = 3.95$, $df = 1$, $p < .05$) significantly higher for the usual services group. Psychiatric re-hospitalization was more frequent in the usual services group during all intervals except one (Figure 1).

Housing stability was associated with a reduced odds of re-hospitalization (OR=.96, 95% CI=.92–.99), the only covariate that was significant in the logistic model.

Discussion

Consistent with our previously reported results on the impact of CTI on homelessness, assignment to the intervention was strongly and significantly associated with a reduced occurrence of re-hospitalization during the final three follow-up intervals of the study. That this impact was evident well after CTI ended provides further support that a time-limited intervention delivered during a critical period can have enduring positive effects. The results also point to the relationship between housing stability and reduced psychiatric re-hospitalization, highlighting the importance of interventions that enhance housing tenure

following hospital discharge (10). Since the positive impact of the intervention remained evident after controlling for housing stability, it appears that the effect was not entirely explained by increased housing stability. Other possible mechanisms include direct emotional and practical support provided by the CTI worker, enhanced access to treatment services and community supports, as well as reduced psychiatric symptoms (11). Increased adherence to psychotropic medications may also have contributed to reducing the risk of re-hospitalization, however we lacked a reliable measure of medication use, which is a limitation of the study.

Conclusion

Time-limited care coordination interventions that link vulnerable individuals with sources of ongoing support during critical transition points appear to have an enduring positive impact in reducing re-hospitalization and other adverse outcomes. Further studies are needed to assess the long-term impact of the model and to further explore a variety of possible mechanisms through which CTI may operate.

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Figure 1. Proportion of participants in the experimental and control groups who experienced at least one night of psychiatric hospitalization in each interval over the 18-month follow-up period.