Treatment Retention Among Patients Participating in Coordinated Specialty Care for First-Episode Psychosis: a Mixed-Methods Analysis

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Abstract

Young adults experiencing first-episode psychosis have historically been difficult to retain in mental health treatment. Communities across the United States are implementing Coordinated

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Specialty Care to improve outcomes for individuals experiencing first-episode psychosis. This mixed-methods research study examined the relationship between program services and treatment retention, operationalized as the likelihood of remaining in the program for 9 months or more. In the adjusted analysis, male gender and participation in home-based cognitive behavioral therapy were associated with an increased likelihood of remaining in treatment. The key informant interview findings suggest the shared decision-making process and the breadth, flexibility, and focus on functional recovery of the home-based cognitive behavioral therapy intervention may have positively influenced treatment retention. These findings suggest the use of shared decision-making and improved access to home-based cognitive behavioral therapy for first-episode psychosis patients may improve outcomes for this vulnerable population.

Introduction

Approximately 100,000 adolescents and young adults in the United States (U.S.) experience first-episode psychosis (FEP) each year.[1,2] Early intervention with evidence-based treatment is recommended for clinical and functional recovery for individuals with FEP.[3,4] Research supports the effectiveness of FEP interventions that include low doses of atypical antipsychotic medications,[5,6] cognitive behavioral therapy (CBT),[7–10] family education and support,[11–13] and supported employment and education.[14,15] Two elements of early intervention in FEP that are distinct from standard mental health care include early detection and phase-specific treatment.[16] The implementation of effective early interventions for FEP can potentially improve patient outcomes and reduce the burden of illness associated with psychotic disorders. Coordinated Specialty Care (CSC) is a recovery-oriented treatment program for individuals experiencing FEP.[1]

Young adults experiencing FEP have historically been difficult to engage and retain in ongoing mental health treatment.[17] Approximately one third of young adults experiencing FEP delay treatment for 1 to 3 years.[18] Once in treatment, the majority of FEP patients drop out within the first year of care.[18] Causes for this alarmingly high rate of early disengagement from treatment include poor therapeutic alliance, mistrust of the system, and poor insight into the need for treatment.[17] Treatment disengagement has been shown to result in poor clinical outcomes including symptom relapse and psychiatric hospitalization.[17] Thus, FEP interventions seeking to improve treatment engagement and retention have the potential to improve clinical outcomes for this vulnerable group. Research suggests that specialized FEP programs are more successful in engaging young people in mental health services compared to routine care.[19] Additionally, FEP patients participating in specialized FEP clinics remain in treatment longer compared to those in standard community clinics.[20] To engage and retain FEP patients in treatment, CSC utilizes a team-based approach and offers a continuum of evidence-based services within a framework of collaborative treatment planning[21] and shared decision-making.[1,22] The CSC program aims to personalize treatment for patients to meet recovery-oriented goals focused on developmental milestones.[1]

In 2015, a CSC pilot program was implemented at a community mental health clinic in a large urban area. An evaluation of the pilot program found that the majority of patients who participated in the CSC pilot project ($n = 129$) were retained in mental health treatment for 9 months or more, compared to 72 days on average for patients participating in standard treatment at another safety-net clinic within the same mental health system. Compared to the continuum of services CSC patients participated in, standard treatment patients only participated in psychiatric medication management and case management services. To compare treatment lengths of stay, treatment as usual patients were randomly identified from a clinic sample ($n = 1503$ eligible controls) and matched with CSC patients for age, gender, and psychotic symptom severity. Because the relationship between CSC service participation and treatment retention remains underexplored, the

current study expands upon prior research by examining treatment retention operationalized as the likelihood of remaining in the CSC program for 9 months or more.

Methods

Study design

This mixed-methods study examined utilization data for continuously admitted CSC patients and interview data from interviews conducted with CSC providers after the program was fully implemented. This study was approved by the University of Texas Health Science Center Houston Institutional Review Board (IRB) by expedited review and approval.

Setting and population

The study data were obtained as part of the program evaluation of the CSC program implemented at a safety-net psychiatric outpatient clinic in a large urban area. The following eligibility criteria were established for participation in the CSC program:

- Received a qualifying diagnosis (or initiated psychiatric treatment) for a psychotic disorder within the previous 2 years: schizophrenia spectrum diagnosis, major depressive disorder with psychotic features, or bipolar disorder with psychotic features;
- Be between the ages of 15–30;
- Be uninsured (cannot be enrolled in Medicaid or commercial insurance); and
- Agree to participate in 7 h per month of CSC services.

Coordinated Specialty Care

The CSC program in the current study was implemented as a comprehensive wrap-around program designed to meet the individualized needs of patients experiencing FEP. [23] The program incorporated the core concepts of the Prevention and Recovery in Early Psychosis (PREP(®)) program including a focus on early, evidence-based, person-centered, phase-specific, integrated, continuous, and comprehensive care).[24] Clinic-based CSC services included pharmacotherapy with a psychiatrist trained in FEP treatment. Home-based services included CBT, supported employment and education, case management, and peer support.

Pharmacotherapy Each patient enrolled in the CSC pilot program was followed by a psychiatrist specializing in early psychosis recovery. Pharmacotherapy included the use of lower medication dosages, establishment of medication adherence practices, monitoring for evolving or changing psychopathology, emphasis on patient functioning, development of healthy lifestyle habits, and ensuring optimal metabolic and cardiovascular health through regular primary care services in coordination with the patient's psychiatric care.[25] Shared decision-making was used to guide interactions between the CSC psychiatrist and patient.[26]

Home-Based Cognitive Behavioral Therapy Home-based CBT was delivered by a licensed master's level psychotherapist with current Texas certification in CBT. The CBT intervention provided within the CSC program targeted the following domains: illness management, medication adherence, residual symptoms, trauma, substance use, life skills, and social/occupational/educational functioning.

Supported Employment and Education Home-based supported employment and education services were delivered by an employment and education specialist utilizing a manualized intervention to assist patients with reentering the workforce or enrolling in school.

Case Management Home-based case management services were provided by a rehabilitation clinician who assisted patients in accessing community resources and supports and to navigate the criminal justice system. Specific linkages to medical and social services included primary care coordination, food stamp application assistance, and housing program application assistance.

Peer Support A FEP-trained peer support specialist participated as a CSC team member and provided ongoing support to CSC patients. Using shared decision-making, peer specialists worked with CSC patients to identify treatment options and to explore treatment preferences.

Patient Assessments Each CSC patient was assessed at program admission and every 90 days during treatment by a CSC clinician who completed a functional assessment, the Adult Needs and Strengths Assessment (ANSA).[27,28] As part of the ANSA, patient functional improvement and the severity of each patient's psychosis/thought disturbance were assessed by a psychotherapist for each CSC patient to plan for ongoing behavioral health needs. To tailor CBT interventions, two validated measures of psychotic symptoms, the Positive and Negative Syndrome Scale (PANSS)[29] and the Brief Psychiatric Rating Scale (BPRS),[30] were administered at intake and after 9 months of service participation. To improve program implementation fidelity, the study investigators conducted ten onsite PANSS and BPRS assessment trainings with the psychotherapists from June 2015 through January 2016. Inter-rater reliability was established during four trainings and ranged from 70 to 85%.

Study protocol, measurements, and outcome measures

To systematically examine predictors of treatment retention for CSC patients, Andersen's Behavioral Model of Health Services Use was used to select study variables and to organize the study findings. The Andersen model conceptual framework includes factors shown in a number of studies to explain variation in health service use among vulnerable populations.[31,32] In adapting the framework for the study, the association of factors of these types with remaining in the CSC program for 9 or more months was examined. Treatment retention for 9 months or more was established as the outcome measure as this time point allowed for three completed ANSA functional assessments by CSC providers. The research questions for the study were:

1. Do predisposing factors including the patient's age, gender, or race/ethnicity differentially predict treatment retention for FEP patients?
2. Do enabling factors including the type of mental health or social support services differentially predict treatment retention for FEP patients?
3. Do need factors including the patient's primary psychiatric diagnosis and psychotic symptom severity differentially predict treatment retention for FEP patients?

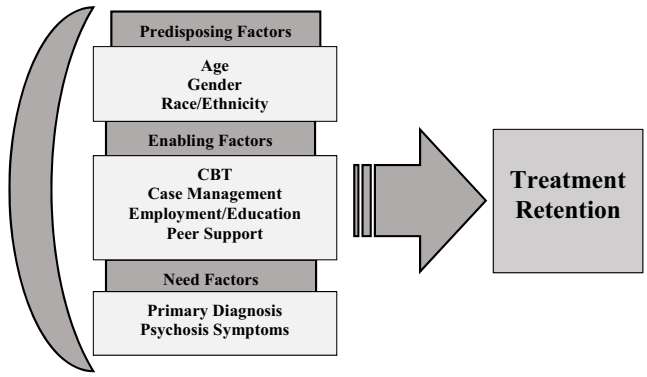
Predisposing, enabling, and need factors identified in prior research as being associated with the utilization of mental health services and treatment retention were included as predictors in the multivariate analysis. In the Andersen model, predisposing (characteristics of the individual, i.e., age, sex, race/ethnicity), enabling (system or structural factors that make health service resources

available to the individual), and need (clinical) factors are posited to act independently or together to influence patterns of healthcare utilization and outcomes for individuals with SMI.[32,33] The predisposing factors examined included age,[33–38] sex,[36,37]and racial/ethnic minority status.[38–42] The enabling factors examined included CSC service components (home-based CBT, supported employment and education, case management, and peer support).[5–15] The need factors examined included primary psychiatric diagnosis and psychotic symptom severity. [37,42–46] The conceptual model for the study shown in Fig. 1 was adapted from prior research using the Andersen framework. [47–50]

Data analysis

Quantitative Treatment retention was examined for all continuously admitted CSC patients between November 1, 2014, and June 30, 2016. Chi-square tests of homogeneity and independent *t* tests were calculated to determine whether differences in predisposing, enabling, and need factors between remaining in CSC treatment for 9 months or more or discontinuing treatment were statistically significant ($p < 0.05$; $p < 0.001$) for categorical and continuous variables, respectively. To examine the influence of the factors in the Andersen model on treatment retention, logistic regression analysis was used for predictive modeling. Treatment retention was dichotomized as a binary outcome variable: discontinuing treatment/remaining in treatment. Unadjusted analyses were conducted to examine the relationship between each predictor variable and treatment retention. To estimate the odds of treatment retention, a logistic regression model was fitted using block-wise entry of variables. Block-wise entry of variables enabled the contribution of predisposing, enabling, and need variables to be examined separately as blocks as done in prior research using the Andersen model to examine psychiatric service utilization.[48–50] Prior to conducting the multivariate analysis, the appropriate diagnostic checks were completed to ensure the model fits sufficiently well and to check for influential observations impacting the estimates of the coefficients. Age was moderately positively skewed, and a square root transformation was undertaken.[51,52] The sample was examined for data entry mistakes and for missing data. All data were complete and no data entry mistakes were identified; therefore, data for all 129 patients were included in the analyses. The multivariate model was examined for multicollinearity by examining

Figure 1
Andersen Behavioral Model of Health Services Use



the variance inflation factors (VIFs) for all the variables in the model. All VIFs were less than 2.0, indicating multicollinearity did not affect the variance of the model.[53] The fit of the logistic model was examined using the Omnibus tests of model coefficients, the classification table, the Hosmer-Lemeshow goodness-of-fit test, and the Cox/Snell and Nagelkerke pseudo *r*-squared (R^2). Due to the small sample size ($n = 129$) and the number of predictors included in the multivariate model ($n = 9$), bootstrapping with random sampling with replacement was utilized to validate the model. Bootstrapping, a Monte Carlo simulation technique, allows assigning measures of accuracy to sample estimates.[54,55]

Qualitative To supplement the quantitative analysis findings, nine key informant interviews were conducted with CSC providers who had first-hand knowledge of CSC program services and patients. Interview participants included two CSC clinical team leads, one psychiatrist, three CSC psychotherapists, one supported employment and education specialist, one rehab clinician, and one peer support specialist. Grounded theory was utilized as a conceptual framework for identifying themes and generating a theoretical explanation for treatment retention within the CSC program.[56,57] The key informant interviews were designed to obtain detailed information across four domains including (1) CSC program characteristics and resources; (2) CSC program implementation successes and barriers; (3) patient engagement, utilization, and medication adherence; and (4) factors affecting patient clinical and functional outcomes. All key informant interviews were conducted using a semi-structured interview instrument (Table 1). The key informant interviews were conducted in person by the study principal investigator (PI). A research assistant assisted with the key informant interviews by observing the interviews, taking notes, and asking additional questions to ensure interview data quality. The only participant not interviewed in person was the peer support specialist, who was on bereavement leave and participated in a telephone interview with the PI. Prior to beginning each interview, informed consent was obtained for each participant, who was informed that anything they said during the interview would be held in the strictest confidence and they would not be quoted directly. Participants were told if they chose not to participate in the interview, their decision not to participate would not be disclosed to their employer. Participants were given the opportunity to ask any questions or voice any concerns prior to being asked the first interview question. All interviews were recorded and transcribed. The interview data was aggregated, and a coding rubric was developed to code interviews. Two of the investigators (J.H. and D.W.) used an iterative, open-coding approach to identify major themes in the key informant interview data.[58] Each investigator worked independently when coding the interview data and was blinded to the coding used by the other investigator until the coding process was completed. The inter-coder agreement for two coders using Krippendorff's alpha was 90% (−0.039) for $n = 40$ cases (36 agreements, four disagreements).[59] Disagreements in coding were resolved through negotiated consensus, refining, and finalizing the coding structure. During the indexing process, the coders documented how many times a particular response to an interview question was made by an interviewee to identify themes and underlying theoretical constructs. The final indexed text providing a listing and frequency of the codes mentioned in the interview text (overall, within each interview, and across interviews) is presented in Table 2. Across interviews, if a particular comment was made only once, then the comment was not included. If a response was made by two interviewees, then it was reported as an issue raised by a few interviewees. If a response was made by three interviewees, then it was reported as an issue raised by several interviewees. If an issue was raised by five or more interviewees, then it was reported as an issue raised by the majority of interviewees.[60] Using grounded theory to guide the termination of the data analysis, saturation was defined as the point at which no new codes were occurring in the data[61] and as the point at which a complete range of theoretical constructs was fully represented by the data.[62] Member checking was conducted to improve the quality of the interpretation and to

Table 1

Semi-structured interview instrument

Domain One: *CSC Program Characteristics, Resources and Services*

1) What program services and/or characteristics do you think were most effective in contributing to patient success?
2) What aspects of the program, if any, had less impact on patient success?
3) Which program resources were most helpful in achieving program success and why?
4) Were there resources you needed that weren't available? Yes/No
5) If yes, how could we improve access to resources?
6) Do you think all the needed services were offered to patients? Yes/No
7) If not, are there any additional services that you would recommend?

Domain Two: *Challenges and Benefits of Implementing the CSC*

8) What are the factors that led to beneficial outcomes of the program? Please comment on each outcome below.
a. Patient clinical improvement
b. Patient functional improvement
c. Treatment Adherence/Engagement
d. Reduced hospitalizations
e. Obtaining Employment
f. Maintaining Employment
g. Education
h. Housing
i. Primary Care Coordination

9) What were the main challenges you faced implementing CSC?
10) What resources would help in resolving challenges to implementing CSC?
11) Please describe factors that contributed to patient discontinuation of services/unplanned discharges?

Domain Three: *Patient Engagement, Utilization, and Treatment Adherence*

12) Please describe how patient engagement in CSC services was successful.
13) What are ways that you would recommend to improve patient engagement?
14) What contributed to low SES scores (poor engagement) in each of the following domains:
a. Engagement
b. Collaboration
c. Help-seeking
d. Treatment adherence

15) To what extent were barriers to engagement due to each of the following and how could they be addressed:
a. Clinical factors (e.g. clinical symptoms/cognitive functioning)
b. Social factors (e.g. poverty, unemployment, lack of other resources)
c. Program characteristics (e.g. program design)
d. System features (e.g. health insurance policy such as patients obtaining Medicaid or commercial insurance)

16) Overall, how would you describe your patients' consistency with attending scheduled appointments?
17) What do you believe are the most prominent reasons for patient drop-out?
**18) What services are patients missing out on upon being discharged due to enrollment in Medicaid or commercial insurance? **

Domain Four: *Factors Affecting Patient Clinical and Functional Outcomes*

19) What have been challenges regarding each outcome below?

a. Patient clinical improvement
b. Patient functional improvement
c. Treatment Adherence/Engagement
d. Reduced hospitalizations
e. Employment
f. Education
g. Housing
h. Primary Care Coordination

20) Do you have any patient stories you can share where the patient's course of illness worsened after being discharged from CSC due to obtaining Medicaid or commercial insurance?

validate the qualitative analysis findings.[63] To protect participant confidentiality, aggregated interview data was provided to participants for the purpose of verifying the plausibility of and for obtaining feedback on the findings. [64,65] The researchers triangulated emerging insights with patient interview data obtained from two semi-structured interviews conducted as part of the CSC program evaluation.[66] The major themes that emerged from the analysis of the key informant responses are described in the "Results" section.

Results

Sample characteristics

During the study period, 129 patients were enrolled in CSC services, and 76 (58.9%) were retained in treatment for 9 or more months. The majority of CSC patients were male (58.9%) and African American (53.9%). While the CSC program was developed for patients diagnosed with emerging schizophrenia, a substantial proportion of the patients served within the CSC program were diagnosed with major depressive disorder with psychotic features (25.6%) or bipolar disorder with psychotic features (20.9%). While all CSC patients were followed by the CSC psychiatrist, additional CSC services were offered to patients through a shared decision-making process. Most patients chose to participate in case management (79.8%) and home-based CBT (57.4%); however, less chose to participate in supported employment and education (33.3%), and peer support services (22.5%). A full listing of sample characteristics is included in Table 3.

Statistical analysis

To test the hypothesis that predisposing, enabling, and need factors differentially predicted treatment retention, a logistic regression model with block-wise entry was conducted. The final adjusted analysis included all 129 continuously admitted patients. On adjusted analysis, among predisposing factors, male gender became significantly associated with the odds of being retained in CSC services for 9 or more months. Compared to females, males were three times more likely to be retained in treatment (adjusted odds ratio [aOR] = 2.989, 95% confidence interval [CI] = 1.154 to 7.742, $p = 0.024$). Among enabling factors, participating in home-based CBT remained significantly associated with the odds of treatment retention. Compared to patients who did not participate in home-based CBT, patients who participated in home-based CBT were 7.3 times more likely to be retained in treatment (aOR 7.278, CI 2.803 to 18.900, $p < 0.001$). The explained variance of the total model containing all significant predictor variables by Cox/Snell and Nagelkerke pseudo R^2 was 0.293 and 0.395, respectively. The Hosmer and Lemeshow goodness-

Table 2

Listing and frequency of the codes mentioned in the interview text

Code frequency within semi-structured interview data

Code	Mentioned overall	Mentioned within same interview	Number of interviews mentioned
Multidisciplinary team approach			
Multidisciplinary teamwork	26	6	7
Offering multiple layers of support (wrap-around services)	7	2	5
Collectively reinforcing treatment engagement and medication adherence	14	3	8
Working together to provide educational and vocational support	10	4	5
Weekly treatment team meetings	2	–	2
Improved staff awareness of patient clinical issues and engagement problems	3	2	2
Emphasizing patient functioning	4	–	4
Collectively reinforcing life skills	7	–	7
Reinforcing trust and connection between patients and other providers (therapeutic alliance)	9	2	7
Provider flexibility			
Small caseloads	3	–	3
Same-day appointments for patients in crisis	5	2	3
Creative therapy methods to improve engagement	8	3	5
Providing opportunities to re-engage	2	–	2
Working evening and weekend hours	4	–	4
Overwhelmed with multiple providers and services (team-based services)	5	–	5
Taking on responsibilities beyond traditional roles	8	2	6
Adapting the CBT curriculum for CSC	11	3	5
Addressing patient engagement barriers	10	2	9
Providing psychoeducation	8	4	5
Teaching life skills	7	2	6
Shared decision-making			
Program philosophy	3	–	3
Patients choosing services and providers	5	–	5
Peer support	2	–	2
Patient communication about	3	–	3

Table 2
(continued)

Code frequency within semi-structured interview data			
Code	**Mentioned overall**	**Mentioned within same interview**	**Number of interviews mentioned**
values and preferences			
Patient-centered and individualized (meeting patients where they are at)	12	3	3
Readiness for program participation	7	5	4
Patient engagement barriers			
Negative symptoms of psychosis	4	2	3
Prior trauma	3	–	3
Stigma	4	–	4
Lacking insight	7	2	5
Substance use	12	5	6
Criminal justice issues	2	–	2
Low intellectual functioning	3	–	3
Family conflict and lack of support	13	3	4
Limited social support	17	4	4
Poverty/lack of basic resources	9	2	7
Change in insurance status	15	14	6
Change in employment status	3	2	2
Housing instability/homelessness	6	5	5
Medication non-adherence	21	6	8

of-fit test indicates a good model fit ($\chi^2 = 7.256$, degrees of freedom [df] = 8, $p = 0.509$). The Omnibus test of model coefficients was highly significant, also indicating that the full model as a whole fits significantly better than the null model and the independent variables predicted the dependent variable well ($\chi^2 = 44.738$, df = 9, $p < 0.001$). The classification table was examined for each block in the logistic regression model. The overall percentage of cases for which the dependent variables were correctly predicted was 58.9% in the null model and 76.7% in the full model. Both male sex (beta [β] = 1.095, CI 0.177 to 2.420, $p = 0.020$) and participation in home-based CBT ($\beta = 1.985$, CI 1.098 to 3.595, $p = 0.001$) were significantly associated with treatment retention in the bootstrap analysis. Thus, the significant findings for these predictor variables in the multivariate model were validated in the bootstrap analysis. While not a significant predictor in the multivariate analysis, African American race became a marginally significant predictor in the bootstrap analysis ($\beta = -1.285$, CI −3.115 to 0.015, $p = 0.047$). Among predisposing, enabling, and need factors, in the adjusted analysis, the largest change in pseudo R^2 occurred with the addition of the second block of enabling factors (R^2 increase = 0.312) followed by the first block of predisposing factors (R^2 increase = 0.054). The smallest change in pseudo R^2 occurred with the addition of the third block of need factors (R^2 increase = 0.029). A full listing of the results of the unadjusted, adjusted, and bootstrap analyses is presented in Table 4.

Table 3
CSC sample characteristics

Characteristic	Total *N* (%)	Treatment retention ≥ 9 months *N* (%)	Chi-square (df)	*p* value
Sex			3.612 (1)	0.057
Male	76 (58.9)	50 (65.8)		
Female	53 (41.1)	26 (49.1)		
Age (years)			–	0.922
Age mean (SD)	23.14 (3.35)	23.12 (3.32)	–	
Race/ethnicity			7.527 (2)	0.023*
Non-Hispanic White	55 (42.6)	33 (60.0)		
African American	69 (53.5)	43 (62.3)		
Other race/ethnicity	5 (3.9)	0		
Primary diagnosis			4.962 (2)	0.084
Schizophrenia spectrum	69 (53.5)	40 (58.0)		
Bipolar disorder with psychotic features	27 (20.9)	12 (44.4)		
Major depressive disorder with psychotic features	33 (25.6)	24 (72.7)		
Intervention component				
Home-based CBT	74 (57.4)	58 (78.4)	27.164 (1)	0.000**
Case management with a rehab clinician	103 (79.8)	67 (65.0)	7.943 (1)	0.005*
Supported employment and education	43 (33.3)	30 (69.8)	3.139 (1)	0.076
Peer support	29 (22.5)	23 (79.3)	6.429 (1)	0.011*

*$p < 0.05$
**$p < 0.001$

Grounded theory

Four major themes were drawn from the key informant interviews: (1) multidisciplinary team approach, (2) provider flexibility, (3) shared decision-making, and (4) patient engagement barriers.

Multidisciplinary Team Approach Across program services, providers reported that the multidisciplinary team approach within CSC enabled them to offer multiple layers of support to patients. According to a CSC provider, "working as a multidisciplinary team, we are able to reinforce trust and connection between patients and other providers on the treatment team." Multiple providers reported using the team-based approach to address patient medication adherence and improve functioning. A few providers identified weekly treatment team meetings as beneficial in increasing their awareness of patient clinical issues and engagement problems. A theme emerged among providers that the emphasis on patient functioning was a strength of the CSC program, and through multidisciplinary teamwork, they could collectively reinforce life skills to improve patient functioning. One patient reported that the CSC program helped her "see other options and gain independence." Working with her CSC treatment team, she reported reaching her psychotherapy goals to reduce hopelessness and suicidal thoughts and finding a medication regimen that worked.

Table 4
Predictors of CSC treatment retention

Predictors	Unadjusted OR	95% CI	*p* value	Adjusted OR	95% CI	*p* value	Bootstrap beta	95% CI	*p* value
Predisposing ($R^2 = 0.054$)									
Age at admission (Sqrt)	0.771	0.278–2.138	0.618	0.855	0.232–3.146	0.814	−0.157	−1.715–1.397	0.820
Sex (male)	1.997	0.975–4.092	0.059	2.989	1.154–7.742	0.024*	1.095	0.177–2.420	0.020*
African American race	0.475	0.201–1.121	0.089	0.277	0.073–1.052	0.059	−1.285	−3.115–0.015	0.047
Enabling ($R^2 = 0.366$)									
Home-based CBT	7.451	3.383–16.413	0.000**	7.278	2.803–18.900	0.000**	1.985	1.098–3.595	0.001**
Case management	3.515	1.424–8.679	0.006*	1.631	0.528–5.043	0.396	0.489	−0.682–1.812	0.375
Supported employment/education	2.007	0.923–4.363	0.079	1.007	0.384–2.643	0.989	0.007	−1.299–1.164	0.987
Peer support	3.399	1.275–9.062	0.014	2.897	0.877–9.571	0.081	1.064	−0.154–2.723	0.076
Need ($R^2 = 0.395$)									
Schizophrenia	0.920	0.455–1.859	0.815	0.419	0.138–1.271	0.124	−0.870	−2.313–0.302	0.134
Psychosis symptoms	1.853	0.911–3.768	0.089	1.865	0.758–4.588	0.175	0.623	−0.364–1.785	0.180
Constant	–	–	–	0.465	–	0.818	−0.765	−8.958–7.307	0.830

*$p < 0.05$
**$p < 0.001$

Provider Flexibility The majority of CSC providers reported that provider flexibility was critical to engaging and retaining FEP patients in CSC services. Across CSC services, providers reported that their small caseloads enabled them to focus on engaging CSC patients in treatment. To help patients avoid psychiatric hospitalization, several providers reported scheduling same-day appointments with patients in crisis. Multiple providers reported using creative methods including art therapy, role-playing, and outside activities to engage CSC patients. For patients who were not engaging, providers reported "trying to give patients the opportunity to re-engage." During the interviews, several providers reported calling patients at night and on weekends to check in with them to faciliate re-engagement. To keep patients engaged after their functioning improved, providers reported working evening and weekend hours to accommodate patient work schedules. For patients who were overwhelmed working with multiple CSC providers, the psychotherapists provided case management and vocational support in addition to psychotherapy to reduce the number of providers working with the patient. One provider reported "we all do case management." A theme emerged among providers that they would take on responsibilities beyond their traditional roles to meet patient needs. When asked what CSC program characteristics were less helpful, the psychotherapists described difficulties working with patients with elevated negative symptoms of psychosis and explained how more flexibility was needed when working with CSC patients than was provided in the CBT curriculum they were using. Additionally, the majority of CSC providers raised concerns that patients with substance use issues, who were lower functioning intellectually, or who had families who were unsupportive seemed to do less well in the CSC program overall. Both patients reported that the flexibility of their psychotherapists helped them remain in treatment during housing and job transitions. Additionally, they reported that setting goals and problem solving with their psychotherapist helped them get better. One patient reported that before participating in psychotherapy, "I was having a difficult time opening up to people, and now I am able to think more positively and be a better parent." The other patient reported that the CSC team "makes me feel I am not forgotten…everybody on the team is really flexible, meets me where I am at, helps me to get connected, and live independently."

Shared Decision-Making A perception emerged among providers that the shared decision-making philosophy of the program increased program retention because patients could choose which program services to participate in and which providers to work with. A few providers discussed how peer support specialists, who had personal experiences with mental illness and recovery, were instrumental in engaging CSC patients in shared decision-making. One provider reported that the shared decision-making philosophy of the CSC program "allowed patients to have a say and gave them options on choosing what services they wanted." Another provider reported that shared decision-making enabled "patients to be honest and up front with what they want to do from the start." One patient reported that within the CSC program, "I am the driver of my treatment…I am more open now… I am able to talk a lot now." While the majority of providers described the shared decision-making model within the CSC program as "patient-centered and individualized," the majority of providers also reported that some patients were "not ready" for involvement in treatment decisions and were "too acute" for the CSC program.

Patient Engagement Barriers Providers identified multiple reasons for patient disengagement from the CSC program including substance use, criminal justice issues, obtaining commercial insurance or Medicaid, obtaining social security disability, obtaining a job, or moving out of the area. When asked about factors contributing to poor engagement, a few providers reported that prior traumatic experiences and stigma surrounding mental illness impeded help-seeking among some patients. Multiple providers reported that CSC patients lacked insight into their mental illness

and benefitted from psychoeducation. Several providers reported that some CSC patients were living with family members who were not supportive of their recovery and were in denial of their mental health conditions. A few providers suggested an intervention targeting family members was needed to improve patient engagement and medication adherence. Several additional factors were identified as contributing to patient disengagement. One provider reported "some patients have significant environmental stressors…they lose jobs and relationships and they get evicted from their homes." Another provider reported "patients can be stable for months and then stop taking their medications." While the patients acknowledged experiencing family conflict and significant environmental stressors prior to CSC program participation, they discussed how CSC program services enabled them to obtain employment, improve relationships with family members, and feel better about their lives.

Discussion

In the study, the majority of CSC patients (59%) were retained in treatment for 9 or more months, which contrasts previous research findings.[18] The study findings are particularly salient given the challenges of treatment retention among FEP patients. In the adjusted analysis, male gender and participation in home-based CBT were associated with an increased likelihood of treatment retention. The finding that males were more likely to be retained in treatment is interesting, as prior research has consistently associated male gender with treatment discontinuation.[34,36,67–69] In the CSC program, 59% of CSC patients were male. While one of the psychotherapists was male and many of the male patients were referred to him for psychotherapy, prior research has not found gender matching in counseling settings to improve retention rates.[70]

The block of enabling factors explained more of the variation in treatment retention than predisposing or need factors. The finding that patients participating in home-based CBT were approximately seven times more likely to be retained in CSC treatment for 9 or more months is encouraging as FEP patients have been shown to obtain both clinical and psychosocial benefits from CBT.[71] Among the domains targeted within the CBT intervention, the majority of CSC providers reported that medication adherence was critical to retaining patients in the CSC program. CSC providers discussed strategies for improving medication adherence during weekly treatment team meetings that each provider could reinforce separately with the same patient. Working as a team, the psychiatrist and psychotherapists reinforced medication adherence strategies used by the CSC case manager with patients including the use of medication fill boxes for organizing medications. Additionally, the psychotherapists reported addressing medication adherence through discussion of residual symptoms of psychosis. The study findings raise the question as to why case management, supported employment and education, and peer support were not significantly associated with being retained in treatment in the adjusted analysis. As suggested in prior research reviews,[71] three characteristics of the CSC home-based CBT intervention, including its focus on breadth, functional recovery, and flexibility, may have been particularly helpful in retaining patients in the CSC program. First, the focus of the CBT intervention on multiple domains may have been especially beneficial for CSC patients. Research has found CBT approaches for the FEP population that only emphasize one area of concern such as psychotic symptoms have the greatest benefit in the short term (within 90 days).[72,73] Second, the focus of the CSC CBT intervention on functional recovery may have improved the longer-term prognosis of the patients participating in the CBT intervention compared to patients who did not participate in CBT.[70,73–75] Because individuals experiencing FEP are at risk for lagging behind their peers in reaching developmental milestones, CBT interventions that emphasize improvements in social/occupational/educational functioning are recognized as important components of FEP interventions.[76,77] Finally, the flexibility of the individually tailored CBT intervention provided within the CSC program is consistent with FEP best practices, given the heterogeneity of early psychosis.[78] In particular, CSC psychotherapists

reported that case consultations during FEP training were beneficial in tailoring CBT interventions for patients who needed more flexibility. It is also possible that the provision of CBT in patient homes positively influenced the impact of this service component on treatment retention by increasing access to evidence-based psychotherapy for a difficult to engage population. Because past studies examining the effectiveness of CBT with FEP patients have been primarily conducted as randomized trials in clinical settings,[79] additional effectiveness studies are needed to examine the impact of home-based CBT on FEP outcomes.

During the study period, 18 CSC patients (14%) were admitted to a psychiatric hospital while participating in CSC services. The providers identified several factors during the key informant interviews that could be related to the low rate of psychiatric hospitalization including the scheduling of same-day appointments for patients in crisis and calling patients at night and on weekends to check in with them to facilitate re-engagement. While CSC patients who participated in case management were 3.5 times more likely to be retained in treatment in the unadjusted analysis, the relationship disappeared when adjusting for other factors in the multivariate model. Due to the high level of needs within the CSC patient population, providers from other CSC program services were also providing case management to CSC patients. Accordingly, the impact of case management on treatment retention may be more difficult to elucidate. While participation in supported employment and education was not significantly associated with treatment retention in the unadjusted or adjusted analyses, 43 patients (33.3%) obtained employment while participating in CSC and 27 patients (20.9%) enrolled in school. During the key informant interviews, the CSC psychotherapists reported discussing life goals and conducting mock interviews during CBT sessions. In cases where a patient discontinued services because of employment, dropout from the program may be an indicator of a successful outcome and warrants further exploration. Interestingly, peer support was not significantly associated with treatment retention in the unadjusted or adjusted analysis. While not a part of the original RAISE model, peer support models are becoming increasingly popular with both patients and providers.[80] The key informant interview findings suggest peer support services were popular with other CSC providers and were perceived as beneficial in improving patient outcomes.

Among individuals with FEP, shared decision-making is increasingly promoted as a preferred approach for providing person-centered care.[17,80,81] The use of shared decision-making within the CSC program may have positively influenced treatment retention. According to the shared decision-making model, a provider's role is to educate patients about available treatments, to acknowledge and help clarify their preferences and values, and to empower them to take an active role in the decision-making process.[80] While each CSC patient participated in 7 h of services per month, the types of services (CBT, case management, supported employment and education, peer support) varied according to the preferences and treatment goals of the individual patient. To help clarify values and preferences, a peer specialist met with each CSC patient during program enrollment to share personal experiences with mental illness, provide patient education, and elicit any concerns about participation in the CSC program. Thus, the study findings may indicate a need for further development and testing of best practices in the use of shared decision-making by peer support specialists to identify effective approaches within this service delivery component.

The strengths of the study include the diverse sample of patients continuously admitted to an evidence-based program implemented in a real-world setting. Additionally, while the CSC program was developed in the northeastern U.S., the current study was conducted in a large urban area in the southern U.S. Accordingly, the study findings increase the generalizability of the effectiveness of the CSC program in additional U.S. regions. Another strength of this study is the inclusion of patients in the CSC program who were diagnosed with bipolar disorder with psychotic features or major depression with psychotic features, which expands generalizability to individuals with affective psychoses.

Study limitations include limited patient interview data. Due to patient transportation barriers and work schedules, only two key informant interviews with patients were conducted for the

program evaluation. Additionally, both of the patients interviewed were treated by the same psychotherapist, who transported her patients to the interviews. Another limitation included only obtaining interview data for female patients, even though male patients were more likely to be retained in treatment for 9 months or more. Because a different semi-structured interview instrument was used to conduct the patient interviews, the data were included in the qualitative analysis for triangulation but were not included in the initial indexing process. Accordingly, member checking with CSC providers was conducted to validate the qualitative analysis findings. Limitations of the study also include the implementation of the CSC program at only one clinic. Hence, the study findings may be unique to provider practices at the clinic and/or to the FEP population served by the clinic. However, because the patients served within the CSC program were referred across the region served by the public mental health system, the patients are representative of FEP patients served within a safety-net system. To increase generalizability at the system level, future effectiveness research on the CSC program should be conducted within larger systems of care. Another study limitation includes limiting CSC enrollment to uninsured patients, which limits generalizability to this population. The requirement that CSC patients be uninsured was a result of Texas public policy. This policy requirement was recently changed, and individuals with Medicaid and commercial insurance are now able to participate in the CSC program in Texas.

Conclusion

This study is novel in examining treatment retention among FEP patients participating in the CSC program in a real-world setting within a public mental health system. The block of enabling factors was the strongest predictor of treatment retention compared to predisposing and need factors. The findings provide preliminary evidence of the benefits of participating in home-based CBT for improving treatment retention for FEP patients. Among predisposing factors, male gender was associated with an increased likelihood of treatment retention, which contrasts with previous research findings. The addition of a male therapist to the treatment team may have increased patient engagement for some FEP male patients. Additionally, the use of the shared decision-making along with the high overall treatment retention rate has important implications for FEP treatment.

Implications for Behavioral Health

The use of shared decision-making and improved access to home-based CBT for FEP patients, a population at high risk for treatment dropout, may be needed to improve outcomes for this vulnerable population. Future studies can investigate the necessity of the home-based context for CBT delivery, perhaps making it more impactful or simply enhancing accessibility, or whether CBT administered in a more traditional outpatient setting could be equally effective. Findings from such investigations would inform decisions regarding the setting of CBT, including considerations of impact on the time and budget required. The presence of male therapists on the CSC treatment team as well as the use of several innovative strategies (shared decision-making and peer support) suggests opportunities for adapting interventions for FEP patients to increase treatment retention. Additionally, the emphasis on patient functioning is a strength of the CSC program as individuals experiencing FEP are at risk for lagging behind their peers in reaching developmental milestones.

Compliance with Ethical Standards

This study was approved by the University of Texas Health Science Center Houston Institutional Review Board (IRB) by expedited review and approval.

Conflict of Interest The authors declare that they have no conflict of interest.

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