Correlates of Emergency Department Use by Individuals With Bipolar Disorder Enrolled in a Collaborative Care Implementation Study

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Objective: The study assessed correlates of emergency department use among participants in a collaborative care program for bipolar disorder.

Methods: Community-based clinics from two states implemented Life Goals–Collaborative Care (LG-CC), an evidence-based model that includes self-management sessions and care management contacts. Logistic regression determined participant factors associated with emergency department use between six and 12 months after LG-CC implementation.

Results: Of 219 participants with baseline and 12-month data, 24% reported at least one emergency department visit. Participants with a recent homelessness history (odds ratio [OR]=3.76, p=.01) or five or more care management contacts (OR=2.62, p=.05) had a higher probability of visiting an emergency department, after the analyses were adjusted for demographic and clinical factors, including physical health score and hospitalization history.

Conclusions: Participants in a collaborative care program who had a history of homelessness were more likely to use the emergency department, suggesting a greater need for more intensive care coordination.

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It is well documented that persons with serious mental illness, such as schizophrenia and bipolar disorder, have substantial health care costs and poor outcomes (1,2). Collaborative care models (CCMs) have been shown to improve general medical and psychiatric outcomes for persons with serious mental illness (3). CCMs are typically implemented by a clinical nurse or social worker (care manager), who provides individual self-management support, coordinates care between providers (care management), completes outcomes assessments, and works collaboratively with the individual's physician to link the patient to medical specialists.

Because of limited research on the value of CCMs, especially their impact on preventable critical service encounters such as emergency room use, they have not been widely implemented for persons with serious mental illness. Cost-effectiveness of CCMs may not be realized in the short term (less than one year) (4). Moreover, CCMs might need to be further enhanced for persons with serious mental illness, especially given the propensity for these individuals to experience greater clinical severity and lower socioeconomic status compared with the general population (1). Bipolar disorder, which is associated with wide variations in functioning and substantial individual and societal health care costs (5), is an appropriate index condition in which to better understand the key drivers of critical service encounters. This study assessed factors associated with increased emergency department use among patients with bipolar disorder at community-based practices who received a CCM program in a multisite implementation study.

METHODS

This study involved a secondary outcome analysis of the Recovery-Oriented Collaborative Care (ROCC) study, a cluster-randomized controlled implementation trial from 2009–2014 involving five community-based clinics from Michigan or Colorado that was designed to improve the uptake of a CCM for bipolar disorder called Life Goals–Collaborative Care (LG-CC). The study received approval from local institutional review boards. Details regarding ROCC are available elsewhere (6,7). In brief, the study compared implementation strategies provided at sites that offered LG-CC to patients who were diagnosed as having bipolar disorder and who were able and willing to provide informed consent to complete assessments.

LG-CC is an evidence-based CCM (8) that includes four weekly self-management sessions during the first month that focus on managing depressive and bipolar symptoms and ongoing telephone-based care management contacts for up to six months after patient enrollment. Care management contacts are implemented by clinical social workers or master's-level mental health clinicians at each site. Providers from participating clinics received an LG-CC toolkit and training, but they were randomly assigned at the clinic level to receive additional, regular coaching and active technical assistance on a proactive basis to address barriers to LG-CC uptake (9) or as-needed technical support.

Participants gave informed consent prior to attending LG-CC sessions and completed baseline, six-, and 12-month assessments. The primary outcome was self-reported emergency department visits occurring between six and 12 months after the end of the LG-CC intervention period. Because many of the clinics lacked comprehensive medical record data, self-reported data were used in order to capture consistent information across all sites.

Factors thought to influence emergency department visits were also ascertained from the baseline survey and were included in the analyses as covariates, including age, gender, race (white and nonwhite), education (high school or more and less than high school), employment (unemployed and employed or retired), recent (past month) history of homelessness, clinically significant depressive symptoms (score ≥10 on the Patient Health Questionnaire–9 [PHQ-9]) (10), presence of panic symptoms (yes-or-no response to the question "In the past year, did you ever have a spell or an attack when all of a sudden you felt frightened, anxious, or very uneasy?") (11), alcohol use (Alcohol Use Disorders Identification Test [AUDIT-C] three-item survey score, with possible scores ranging from 0 to 12 and higher scores indicating greater alcohol use) (12), illicit substance use, current smoking status, prior hospitalization history, number of self-reported medical conditions, overall general medical health (physical component summary [PCS] score on the 12-item Short-Form Health Survey, with possible scores ranging from 0 to 100 and higher scores indicating greater physical health–related quality of life [PCS-12]) (13), and sites indicator (mental health vs. primary care). Finally, number of LG-CC care management contacts during the six-month intervention was ascertained from provider record reviews. Participants were categorized by number of care management contacts (≥5 or <5) on the basis of previous analyses describing variations in LG-CC completion during the first six months (6).

Descriptive statistics were calculated to summarize the baseline characteristics of the sample and their associations with the outcome variable. Multiple logistic regression analysis (SAS, version 9.3) was used to determine participant factors associated with probability of having an emergency department visit during the six- to 12-month period after the end of the LG-CC intervention period, adjusting for the aforementioned demographic and clinical variables from the survey. Sensitivity analyses were conducted to determine whether additional organizational factors, such as clinic type (primary or mental health care), influenced probability of emergency department use, resulting in virtually identical results.

RESULTS

Of the 385 study participants with complete baseline surveys, 139 did not complete the 12-month survey. Of those who completed both surveys, 27 had either missing outcome or covariate data. The final analytical sample included 219 participants (57% retention). The 166 participants excluded from the analysis were not significantly different from participants in the analytical sample in any of the characteristics surveyed at baseline, except homelessness history. Persons with a history of homelessness had higher odds of dropping out of the study compared with persons without such a history (odds ratio [OR]=2.16, 95% confidence interval [CI]=1.30–3.58, p=.003). Baseline homelessness history was included as a covariate in the analyses.

Overall 24% (N=53) of the sample reported at least one emergency department visit during the six to 12 months after the end of the LG-CC intervention period. At baseline, the mean±SD age of the analytical sample was 42.6±11.0, 32% (N=71) were male, 72% (N=158) were white, 88% (N=193) had a high school education or less, 73% (N=160) were unemployed, 47% (N=102) were current smokers, 15% (N=33) had a recent history of homelessness, 39% (N=85) had PHQ-9 scores ≥10, 85% (N=185) had moderate anxiety symptoms, 29% (N=64) reported substance abuse, and 24% (N=53) had a history of recent hospitalization. The mean PCS-12 score was 36.3±7.3, the mean AUDIT-C score was 1.2±2.1, and the mean number of comorbidities was 1.6±1.2.

After adjustment for participant demographic and clinical factors and site, the analyses found that participants with a recent history of homelessness at baseline (OR=3.76, p=.01) or five or more care management contacts (OR=2.62, p=.05) at six-month follow-up had a higher probability of an emergency department visit during the six-month period after the intervention ended (Table 1). In addition, patients with a higher PCS-12 score at baseline (indicating better physical health) had lower probability of having an emergency department visit (OR=.94, p=.05).

DISCUSSION

This study determined participant factors associated with probability of emergency department use after the implementation of a CCM (LG-CC) for bipolar disorder in community practices. We found that participants with a recent history of homelessness were more likely to have an emergency department visit compared with participants without such a history, after the analyses adjusted for other clinical and sociodemographic factors. Because homelessness history was associated with missing data or attrition, it is possible that

participants with a history of homelessness who needed to be seen in the emergency department were more likely to participate in the 12-month survey compared with homeless participants who did not need emergency department visits. In prior research, bipolar disorder was associated with increased emergency department use and inpatient hospitalization, the latter representing 60% to 70% of the total direct health care costs for these individuals (14), and much of the increased critical service encounters was associated with instability from homelessness and poverty (1).

This study also found that participants who completed five or more care management contacts had a greater probability of an emergency department visit. Perhaps these individuals had more unmet health services needs that were not observed in the study assessments compared with participants with fewer care management contacts. Most of the individuals enrolled in the study, although primarily recruited from community mental health programs, were not eligible for more intensive case management services, such as assertive community treatment; hence, a subset of the sample, for example, persons with homelessness history, might have required more case management than provided in the relatively brief LG-CC intervention. Perhaps CCMs that emphasize psychoeducation and health care coordination may not fully address social determinants of health, notably homelessness or lack of employment, and for this study population, different types of services, such as social services, housing, or other support systems, might be needed.

There were limitations of this study that warrant discussion. The primary utilization measure was based on participant self-report and was not verifiable with actual utilization data from electronic medical records or claims. However, evidence suggests that patients are more accurate in reporting low-frequency events, such as emergency room visits, than high-frequency events, such as office visits (15). Because LG-CC was implemented for individuals between their baseline and six-month assessments, this study assessed medical care utilization between six and 12 months after receiving LGCC. Finally, there was limited information on the types of care management services provided.

TABLE 1. Probability of emergency department use at 12-month follow-up among patients with bipolar disorder enrolled in Life Goals–Collaborative Care (LG-CC) in community-based clinics, by baseline characteristic

Independent variable	OR	95% CI	p
Age (years)	.99	.95–1.03	.70
Male (reference: female)	.84	.36–1.94	.69
White (reference: nonwhite)	2.39	.96–5.92	.06
High school (HS) education or greater (reference: less than HS)	.95	.31–2.91	.93
Unemployed (reference: employed or retired)	1.50	.58–3.89	.40
Current smoker (reference: nonsmoker)	1.46	.66–3.26	.35
Recent history of homelessness (reference: no recent history)	3.76	1.39–10.20	.01
Patient Health Questionnaire–9 score ≥10 (reference: <10)	1.85	.87–3.94	.11
Panic symptoms in past year (reference: no)	2.09	.59–7.4	.25
N of medical comorbidities	.95	.67–1.33	.75
Alcohol use (AUDIT-C score)[a]	1.10	.91–1.33	.31
Substance abuse (reference: no)	.67	.27–1.65	.38
≥5 LG-CC care management contacts (reference: <5)[b]	2.62	1.00–6.95	.05
PCS-12 score[c]	.94	.89–1.00	.05
Hospitalization history (reference: no history of prior hospitalization)	1.59	.68–3.68	.28
Site (reference: site 5 [MH])[d]			
Site 1 (MH)	.24	.07–.81	.02
Site 2 (MH)	.80	.25–2.54	.71
Site 3 (PC)	.19	.04–.97	.05
Site 4 (MH)	.27	.07–1.14	.08

[a] Alcohol Use Disorders Identification Test 3-item screen
[b] Measured at six-month follow-up
[c] Physical component summary (PCS) score from the 12-item Short-Form Health Survey
[d] MH, community mental health; PC, primary care

CONCLUSIONS

The increased need among health care payers to promote more efficient care has led to a growing interest to implement more proactive models of care to better manage services for patients with chronic general medical and mental health conditions. At the same time, these models of care may not be adequate, especially given that they do not address the socioeconomic determinants of health that exist beyond the practice setting, such as poverty and homelessness. In this study we found a greater likelihood of emergency department use in a patient population with bipolar disorder among those a history of homelessness compared with those without a history of homelessness, despite enrollment in a CCM-based program. These individuals may have unmet service needs that require additional management beyond standard care management. Health care systems deploying CCM-based programs should invest in more resources that address these social determinants of health, which are important predictors of emergency department utilization. Future studies may also require the further intensification of evidence-based CCMs for individuals with serious mental illness in order to potentially mitigate critical service encounters and improve outcomes.

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REFERENCES

1. Insel TR: Assessing the economic costs of serious mental illness. American Journal of Psychiatry 165:663–665, 2008
2. Slade EP, Dixon LB, Semmel S: Trends in the duration of emergency department visits, 2001–2006. Psychiatric Services 61: 878–884, 2010
3. Woltmann E, Grogan-Kaylor A, Perron B, et al: Comparative effectiveness of collaborative chronic care models for mental health conditions across primary, specialty, and behavioral health care settings: systematic review and meta-analysis. American Journal of Psychiatry 169:790–804, 2012
4. Katon W, Russo J, Lin EH, et al: Cost-effectiveness of a multicondition collaborative care intervention: a randomized controlled trial. Archives of General Psychiatry 69:506–514, 2012
5. Bryant-Comstock L, Stender M, Devercelli G: Health care utilization and costs among privately insured patients with bipolar I disorder. Bipolar Disorders 4:398–405, 2002
6. Waxmonsky J, Kilbourne AM, Goodrich DE, et al: Enhanced fidelity to treatment for bipolar disorder: results from a randomized controlled implementation trial. Psychiatric Services 65:81–90, 2014
7. Kilbourne AM, Goodrich DE, Nord KM, et al: Long-term clinical outcomes from a randomized controlled trial of two implementation strategies to promote collaborative care attendance in community practices. Administration and Policy in Mental Health and Mental Health Services Research 42:642–653, 2015
8. Simon GE, Ludman EJ, Bauer MS, et al: Long-term effectiveness and cost of a systematic care program for bipolar disorder. Archives of General Psychiatry 63:500–508, 2006
9. Kirchner JE, Ritchie MJ, Pitcock JA, et al: Outcomes of a partnered facilitation strategy to implement primary care–mental health. Journal of General Internal Medicine 29(suppl 4):904–912, 2014
10. Spitzer RL, Kroenke K, Williams JB: Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. JAMA 282:1737–1744, 1999
11. Spitzer RL, Williams JB, Kroenke K, et al: Utility of a new procedure for diagnosing mental disorders in primary care: the PRIME-MD 1,000 study. JAMA 272:1749–1756, 1994
12. Dawson DA, Grant BF, Stinson FS: The AUDIT-C: screening for alcohol use disorders and risk drinking in the presence of other psychiatric disorders. Comprehensive Psychiatry 46:405–416, 2005
13. Ware J Jr, Kosinski M, Keller SD: A 12-item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. Medical Care 34:220–233, 1996
14. Dean B, Gerner D, Gerner R: A systematic review evaluating health-related quality of life, work impairment, and healthcare costs and utilization in bipolar disorder. Current Medical Research and Opinion 20:139–154, 2004
15. Bhandari A, Wagner T: Self-reported utilization of health care services: improving measurement and accuracy. Medical Care Research and Review 63:217–235, 2006