Collaborative Care for Low-Income Patients From Racial-Ethnic Minority Groups in Primary Care: Engagement and Clinical Outcomes

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Objective: To assess model impact and opportunities for improvement, this study examined collaborative care model (CoCM) engagement and clinical outcomes among low-income patients from racial-ethnic minority groups with depression and anxiety.

Methods: Starting in 2015, the CoCM was implemented in seven primary care practices of an urban academic medical center serving patients from racial-ethnic minority backgrounds, predominantly Medicaid beneficiaries. Eligible individuals scored positive for depressive or anxiety symptoms (or both) on the Patient Health Questionnaire–2 (PHQ-2) and PHQ-9 and the Generalized Anxiety Disorder Scale–2 (GAD-2) and GAD-7 during systematic screening in primary care settings. Screening rates and yield, patient characteristics, and CoCM engagement and outcomes were examined. Clinical improvement was measured by the difference in PHQ-9 and GAD-7 scores at baseline and at 10-to-14-week follow-up.

Results: High rates of screening (87%, N=88,236 of 101,091) and identification of individuals with depression or anxiety (13%, N=11,886) were observed, and 58% of 3,957 patients who engaged in minimally adequate CoCM treatment had significant clinical improvement. Nevertheless, only 56% of eligible patients engaged in the model, and 25% of those individuals did not return for at least one follow-up appointment. Being female with clinically significant comorbid anxiety and depressive symptoms and having Medicaid or commercial insurance increased the likelihood of CoCM engagement.

Conclusions: CoCM can help engage vulnerable patients in behavioral health care and improve clinical symptoms. However, significant opportunity exists to advance the model's impact in treating depressive and anxiety disorders and decreasing health disparities by addressing engagement barriers.

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Advances in integrated models of care that address both general medical and behavioral health needs may offer a more holistic population health strategy to improve care quality and clinical outcomes and reduce health care disparities. The team-based, patient-centered collaborative care model (CoCM) is frequently cited as the integrated care approach with the most evidence-based support (1–3). Key model elements include a care manager assisting in systematic measurement-informed care facilitated by a patient registry, treating to target with stepped care (e.g., problem-solving therapy, behavioral activation, and medication management), and psychiatric case review and consultation. Improving the engagement of vulnerable patients in integrated models such as the CoCM can enhance receptivity and access to behavioral health treatment, representing key steps toward addressing health care inequity and increasing population impact.

HIGHLIGHTS

- The collaborative care model (CoCM) provides an important opportunity to improve access to and engagement in depression and anxiety treatment in primary care for vulnerable populations at risk for health disparities.

- Implemented in clinics from an urban academic medical center serving low-income patients from racial-ethnic minority groups, the CoCM yielded high screening rates and identified individuals with depression and anxiety, with 58% of patients who received at least minimally adequate CoCM showing significant clinical improvement.

- Increasing engagement in CoCM treatment is a priority to expand its population impact, given high attrition rates in this study, with only 56% of eligible patients initially engaging in the model.

One strength of CoCMs is to increase access to behavioral health care for at-risk patients (e.g., patients who are older, from racial-ethnic minority groups, or socioeconomically challenged) with standardized screening to improve identification of patients in need (4–7). This CoCM feature is particularly relevant because significant investments of state and federal funds encourage behavioral health integration in primary care, including the Medicare Shared Savings Program (8), Comprehensive Primary Care Plus (9), and Medicaid 1115 Waiver programs (10). Billing codes made available in 2018 also support CoCMs and improve feasibility of model implementation and sustainability pathways. Increased examination of CoCM's real-world population impact and target areas for improvement—particularly related to increasing engagement of low-income people from racial-ethnic minority groups and medically underserved communities—is essential to informing decisions on future model investments.

Research to date indicates that multiple factors can influence patient engagement in behavioral health treatments, such as age and gender (11, 12), socioeconomic factors (13, 14), race and ethnicity (15–17), clinical severity (12), and presence of comorbid behavioral health diagnoses (18). Gender is one factor, for instance, with male patients being less likely to initially engage in behavioral health treatments, including the CoCM, than are female patients (19). Underserved patients from racial-ethnic minority groups also show less engagement and higher attrition rates than White patients (20), although greater engagement has been observed for patients from racial-ethnic minority groups in CoCM treatments compared with usual depression care or enhanced referrals (5, 21). Greater clinical symptom severity may also be associated with lower rates of initiation and engagement in the CoCM (22). Of note, several studies indicate that only 42%−46% of patients who receive integrated treatment have more than one visit (5, 23).

CoCM outcomes are likely also affected by symptom severity and other patient characteristics. For example, patients with greater depressive and anxiety symptom severity have been less likely to achieve adequate clinical improvement in CoCM treatment than those with lower symptom severity (24–26). Improvement rates for individuals with co-occurring behavioral health conditions may also be lower than among those without these comorbid conditions (27, 28). Similar CoCM clinical outcomes, however, have been reported across male and female patients (19) and when comparing patients from racial-ethnic minority and nonminority populations (29, 30). Some research indicated better health outcomes for patients from racial-ethnic minority groups compared with outcomes for White patients (25, 31), including when minor sociocultural adjustments were incorporated into the model (32). A better understanding of the factors influencing CoCM engagement and outcomes in vulnerable patients may inform model modifications that improve population impact.

In this study, we examined the impact of the CoCM in seven primary care practices serving low-income patients from racial-ethnic minority groups with depressive and anxiety disorders. Unlike most other large-scale CoCM research published to date, which includes primarily patients from nonminority populations and a focus on depression outcomes (33–36), our model implementation included a supermajority of patients from racial-ethnic minority groups (77%) and reported on both depression and anxiety outcomes. We describe the screening rate and yield and examine the impact of patient demographic variables and clinical symptom severity on engagement and outcomes.

METHODS

Setting

The analysis in this study was conducted as part of a demonstration project funded by the Center for Medicare and Medicaid Health Care Innovation Awards. Funding supported CoCM implementation in an urban academic medical center serving predominantly low-income patients from racial-ethnic minority groups. The CoCM sites included seven of the medical center's largest primary care practices in separate and distinct locations in the Bronx and lower Westchester counties of New York State starting in 2015. All practices had level-3 patient-centered medical home designations, and three also had federally qualified health center designations and served as family and general internal medicine teaching sites. The project and analysis were approved by the Einstein Institutional Review Board.

Participants

From 2015 through 2018, eligible patients (≥18 years old) were identified at their primary care appointments with systematic screening for depressive and anxiety symptoms, by using the Patient Health Questionnaire–2 (PHQ-2) and PHQ-9 (37) and the Generalized Anxiety Disorder Scale–2 (GAD-2) and GAD-7 (38), respectively. Before the CoCM, workflows encouraged at least annual depression screens, but they were not performed consistently. Systematic screening was implemented across CoCM sites with administration of the PHQ-2 and PHQ-9 and the GAD-2 and GAD-7, which were completed at visit check-in. Patients were offered treatment if they met the clinical threshold for depressive and anxiety symptoms (i.e., scored ≥10 points on the PHQ-9 or GAD-7) or if they were identified by a primary care physician (PCP) as needing treatment. Higher scores on the PHQ-9 (score range 0–27) or GAD-7 (score range 0–21) indicated greater symptom severity. Patients were excluded from CoCM treatment for depression or anxiety if they had a diagnosis of dementia, cognitive impairment, bipolar disorder, schizophrenia, or any psychotic symptoms.

Intervention

The CoCM intervention used was a variation of the Improving Mood-Promoting Access to Collaborative Treatment (also known as IMPACT) model (39), tailored to better address the health and social service needs of the

predominantly Medicaid population served by including a behavioral health clinician on the team (mainly licensed social workers). The clinician provided assessment and short-term psychotherapy as needed (e.g., problem-solving and cognitive-behavioral therapy) and helped address common concrete social service needs such as housing instability, food insecurity, and assistance with legal challenges. As part of the standard protocols in CoCMs, the PCPs provided initial depressive and anxiety disorder diagnoses and basic psychotropic medication management, if indicated. Consulting psychiatrists provided case reviews by using electronic health records and offered treatment recommendations when needed. They also performed in-person consultations for patients with medically or behaviorally complex conditions or for those whose conditions were not adequately improving. Using a patient registry, the onsite behavioral health care manager facilitated collaboration among team members, identified stepped care opportunities for patients whose conditions were not improving, and provided "between-visit" patient self-management support with systematic follow-up and behavioral activation coaching.

Outcome Measures and Data Analyses

Screening rates and yield, patient demographic characteristics and symptom severity, intervention engagement and attrition rates, and reasons for dropping out were collected to better understand the CoCM's potential population impact. The primary clinical outcome was reduction in depressive and anxiety symptoms as measured by the difference between the baseline PHQ-9 and GAD-7 scores and the last score recorded at a 10-to-14-week follow-up. If a patient did not complete the PHQ-9 or GAD-7 at this follow-up, the last follow-up score obtained was carried forward to the 14-week threshold in a modified intent-to-treat analysis. Adequate treatment response was defined by either a 50% improvement in the PHQ-9 or GAD-7 score from baseline or a score <10 points (indicating normal-to-mild symptoms). Remission was defined as a PHQ-9 or GAD-7 score <5 points (37, 40). Patients with a threshold severity of both depressive and anxiety symptoms at baseline had to have either or both of the PHQ-9 or GAD-7 scores meet improvement or remission criteria.

Individuals who met clinical severity thresholds on the respective scales and had at least one follow-up score were included in the improvement and remission analyses. Logistic regression was used to determine the hypothesized factors associated with improvement. Improvement status (improved vs. not improved) was coded as a dummy variable and served as the outcome variable in the predictive-descriptive model.

The regression model included demographic, clinical, system-level, and patient behavior characteristics. Specific variables were as follows: age, sex, insurance type (commercial, Medicaid, or Medicare), clinical site type (teaching or not), baseline PHQ-9 or GAD-7 score, whether the patient met the baseline clinical thresholds on the PHQ-9 and GAD-7 (comorbid depression and anxiety), and number of days between baseline assessment and first follow-up. The model was used to describe the relationship between

these characteristics and PHQ-9 or GAD-7 score improvement at 10–14 weeks. Variables with $p \leq 0.05$ were considered statistically significant factors affecting the likelihood of improvement.

Patient satisfaction was measured on a six-item, self-reported experience survey on integrated care (41). The survey assessed patients' understanding of their providers' collaborative work, patient health knowledge and patients' perception of the impact of behavioral health on general medical health, and whether health care experiences improved because of the program. Total scores ranged from 0 to 30, with higher scores in each domain indicating a more positive experience and greater health knowledge.

RESULTS

Baseline Screening for Depression and Anxiety

In total, 87% of patients (N=88,236 of 101,091) attending a primary care visit were administered the PHQ-2 and PHQ-9 and the GAD-2 and GAD-7, with 13% (N=11,886) screening positive for clinically significant depressive or anxiety symptoms. (A flow diagram outlining the impact of CoCM on screening rate and yield, engagement, and clinical outcomes is available as an online supplement to this article.) Overall, 8% (N=6,849) had clinically significant comorbid anxiety and depression. Of those screening positive, 12% (N=1,393) were already engaged in behavioral health care, and another 10% (N=1,196) were not eligible for the CoCM because of our exclusion criteria (i.e., severe mental illness or cognitive impairment) and were referred for traditional behavioral health care.

Engagement in the CoCM

Of the 9,297 eligible individuals, 56% (N=5,247) engaged in CoCM treatment during the study period. Engagement was defined as a patient completing an initial assessment with a preliminary diagnosis and agreeing to start treatment. Overall, 63% (N=3,293) of these patients had both significant depressive and anxiety symptoms at baseline, 22% (N=1,153) had clinically significant depressive symptoms only, and 15% (N=801) had only clinically significant anxiety symptoms. Mean scores were in the moderately severe range for both conditions. Patients who initially engaged in treatment (i.e., agreed to CoCM and completed the initial assessment) had significantly higher PHQ-9 and GAD-7 scores than those who did not engage (15.6 vs. 14.5 and 14.5 vs. 13.8, respectively, p<0.001). For those who did not engage in the CoCM (N=4,050), 77% (N=3,137) were lost to follow-up after a positive screen, and 23% (N=913) declined behavioral health services.

No significant differences in age, sex, or insurance type were observed between those who engaged and those who did not engage in treatment. However, predictive modeling with logistic regression indicated that being female, having clinically significant comorbid anxiety-depressive symptoms, and having Medicaid or commercial insurance increased the likelihood of initial engagement in the CoCM.

Clinical Contacts and Treatment Outcomes

For those who initially engaged in the CoCM (N=5,247), 75% (N=3,957) had one or more follow-up contacts during which a PHQ-9 or GAD-7 was administered, indicating a minimally adequate "dose" of the CoCM (Tables 1 and 2). The mean±SD for number of weeks in treatment was 16.3±11.5, and 50% (N=1,979) of the patients receiving the minimally adequate CoCM dose were discharged within 13 weeks. In total, 85% of patients saw the behavioral health clinician (clinical social worker or psychologist); 69% had contact with the care manager; and 60% had a psychiatric chart review, in-person consultation, or both (Table 2). No significant differences were observed in PHQ-9 or GAD-7 symptom severity, age, sex, or insurance type between patients who initially engaged in the CoCM but did not return for follow-up and those with one or more follow-ups (i.e., received a minimally adequate CoCM dose).

For patients with at least one follow-up by 10–14 weeks (N=3,957), 58% (N=2,287) had improved scores on the PHQ-9, GAD-7, or both. Of these patients, 49% (N=1,120) had significantly improved scores on the PHQ-9, with 19% (N=435) having remission, and 50% (N=1,143) had improved scores on the GAD-7, with 20% (N=457) having remission. Two logistic regressions were used to determine factors significantly associated with improvement on the PHQ-9 and GAD-7 scores. Patients with Medicaid were less likely to have improved scores on the PHQ-9 at 10–14 weeks (p=0.001), but this lack of improvement was not statistically significant for those with threshold-level anxiety symptoms. Self-insured patients were less likely to have improved scores on the GAD-7 at 10–14 weeks (p<0.001), but this lack of improvement was not statistically significant for those with threshold-level depressive symptoms.

Patient Satisfaction

A subset of the study population (N=428), selected on the basis of convenience sampling, completed at least four of the six questions on the self-reported patient experience survey to assess treatment satisfaction and health knowledge. Overall, 74% (N=317) rated their experience positively, as "agree" or "strongly agree" on most questions. Items that scored highest (mean=82%−83%) related to patient knowledge about how behavioral health affects general medical health, how to be more responsible for health care, and patient belief that the care team valued their opinion.

DISCUSSION

This study is one of the first that has assessed the impact of a large real-world clinical CoCM implementation, examining engagement rates and outcomes for low-income patients from a racial-ethnic minority population with clinically significant depressive and anxiety symptoms. Our screening rate was higher than or comparable to rates for similar large-scale CoCMs (33, 42–44), with 87% of patients who attended primary care visits receiving a validated depressive and anxiety symptom screen. Although our program fell short of

TABLE 1. Characteristics of patients treated at primary care sites with a minimally adequate dose of the collaborative care model with one or more follow-ups

Variable	N (N=3,957)	%
Age in years (M±SD)	46±16	
Female	3,147	80
Race-ethnicity		
Hispanic	1,939	49
Non-Hispanic Black	1,068	27
Not available	356	9
Other	317	8
Non-Hispanic White	237	6
Asian	40	1
Insurance payer		
Medicaid	2,097	53
Commercial	1,029	26
Medicare	554	14
None or unknown	277	7
Diagnosis		
Major depressive disorders only	820	21
Anxiety disorders only	645	16
Comorbid depression and anxiety[a]	2,492	63
PHQ-9 score (M±SD)[b]		
Baseline	15.6±4.1	
10- to 14-week follow-up	10.5±6.2	
GAD-7 score (M±SD)[c]		
Baseline	14.5±3.2	
10- to 14-week follow-up	9.8±5.7	

[a] Comorbidity refers to patients with positive scores on both the Patient Health Questionnaire–9 (PHQ-9) and the Generalized Anxiety Disorder Scale–7 (GAD-7) at baseline.
[b] The PHQ-9 measures presence and severity of depressive symptoms. Possible scores range from 0 to 27, with higher scores indicating more severe depressive symptoms. The standard positive cutoff is a score of 10.
[c] The GAD-7 measures presence and severity of anxiety symptoms. Possible scores range from 0 to 21, with higher scores indicating more severe anxiety symptoms. The standard positive cutoff is a score of 10.

its 95% screening rate goal, systematic screening helped identify potential behavioral health needs for a large majority of patients who may not have otherwise been assessed. Further, the program's yield of 13% of patients screening positive for clinically significant depressive or anxiety symptoms was notably higher than the average 6%−7% national prevalence of these disorders (45), with most patients (63%) having comorbid depressive and anxiety symptoms warranting treatment. The screening approach used primarily patients' self-reports on the PHQ-2 and PHQ-9 and on the GAD-2 and GAD-7, as opposed to clinician interview, which may have improved detection. These findings suggest high prevalence rates in this vulnerable population with most patients on Medicaid or commercial insurance.

Of those patients with clinical threshold symptoms at baseline, 68% received some treatment (56% engaged in CoCM, and 12% were already engaged in other behavioral health treatment). Patients who received a minimally adequate dose of CoCM (75% of those who initially engaged in the model) averaged six contacts with CoCM) averaged six contacts with CoCM team members during treatment (see Table 2), even

TABLE 2. Care contacts of patients treated at primary care sites with a minimally adequate dose of the collaborative care model (CoCM) with one or more follow-ups

Variable	N (N=3,957)	%	M±SD
Primary care after CoCM engagement	2,136	54	1.9±1.6
Psychiatrist (in person and chart review)	2,374	60	2.2±1.6
Psychiatrist (in person only)	396	10	1.0±.7
Clinical social worker or psychologist (in person only)	3,363	85	3.8±3.2
Care manager (in-person and phone contacts)	2,730	69	2.2±1.5
All	3,957	100	5.7±5.0

with the typically higher no-show follow-up rates in this population. Psychiatric chart reviews or consultations, typically reserved for clinically complex cases or those not responding to treatment, were conducted on most (60%) of these CoCM patients.

Of note, clinical outcomes in this real-world implementation were comparable to those in previous large-scale CoCM studies (26, 35, 39, 46), with 58% of patients meeting the clinical symptom improvement threshold when receiving minimally adequate CoCM treatment, including 19% and 20% remission rates for depressive and anxiety symptoms, respectively. These improvement rates may not account for possible patient outcomes related to enhanced functional status (e.g., decreased impairment in work or school, social relationships, or activities of daily living) or outcomes for those who dropped out and may have improved, because measures for these data were not included in the study. Interestingly, the improvement rates and remission responses observed in this study were achieved in a shorter, 3- to 4-month average treatment duration, compared with the more typical ≥6 months reported in previous CoCM research (3, 35, 39).

Taking a more conservative population-level perspective, we note that only 43% of patients who were initially eligible for the CoCM received a minimally adequate treatment dose (i.e., one or more follow-ups with administration of a PHQ-9 or GAD-7). Considerable patient attrition also occurred after initial treatment engagement, with 25% of patients not returning to complete a follow-up contact, although this rate was better than the >50% attrition rate after one visit reported in other studies (5, 23). Retention rates were relatively low, even with the availability of our CoCM behavioral health clinician, who met with most patients early in treatment to assess psychotherapy and concrete service needs, and with the care manager's flexibility to engage patients between office visits. These findings are sobering and indicate that even with the CoCM, considered a gold-standard behavioral health integration model in primary care, more work is needed to identify and overcome barriers to engaging vulnerable patients and advance the model's impact.

Several clinical and demographic factors appeared to significantly affect CoCM engagement. Interestingly, although previous research suggested that greater symptom severity is correlated with lower CoCM engagement (23), our findings indicated the opposite, with patients who reported more severe baseline depressive and anxiety symptoms being more likely to initially engage in the model. This observation is in line with our clinical observations that patients with greater symptom severity seemed more willing to work with the CoCM care manager. Flexible contact options for the care manager and patient (e.g., by telephone, in person, or patient preference for contact frequency) may have increased engagement by reducing the burden of scheduling and attending in-person visits. CoCM engagement also increased when patients were female, had clinically significant comorbid depressive and anxiety symptoms, and had Medicaid or commercial insurance.

This program's engagement results inform potential target areas for CoCM modifications and improvements. For instance, decreasing attrition early in treatment might involve identifying and addressing potential barriers to engagement, starting at the initial contact, especially for at-risk patient groups. Our CoCM teams often reported that cultural and socioeconomic concerns, such as perceived stigma and biases toward behavioral health (particularly among male patients), copay burden, transportation, and appointments imposing on family and employment responsibilities, frequently impeded engagement. These barriers to patient engagement also are supported by previous research (47, 48). Improving efficiency of the model and access to the CoCM team through technology integration (e.g., smartphone applications and patient-facing portals) also may reduce engagement barriers (49). With the current rise of billable telehealth services, which accelerated during the COVID-19 pandemic, use of technology is now more practically and financially feasible.

Focusing on timely follow-up after initial assessment and improving time-sensitive and assertive stepped care may be particularly important target areas for vulnerable patient populations from racial-ethnic minority groups. Given that these groups often have greater clinical severity due to unmet needs and less buy-in of behavioral health treatment than White patients, lengthier times to follow-up or needed treatment adjustments may require particular attention when trying to improve minority groups' engagement in CoCM. For instance, our clinical observations suggest that PCPs were highly variable in making timely adjustments to medications, and it often fell to the psychiatrist to make the adjustments after the care manager or behavioral health clinician reported delays in needed medication changes. These overdue adjustments may have delayed treatment responses among some patients and decreased already tenuous buy-in of behavioral health treatments, leading to nonadherence and premature CoCM treatment dropout.

CONCLUSIONS

We are unaware of other CoCM implementation studies—especially studies on both depressive and anxiety symptom

outcomes in a low-income, medically underserved population with diverse racial-ethnic minority groups—that have analyzed patient characteristics, engagement and attrition rates, and outcomes data in similar detail as done in this study. Our findings support the potential population-health impact of CoCM, given the improved access and outcomes observed in the at-risk, vulnerable patients who engaged in this model. However, our findings also highlighted a significant need for targeted CoCM modifications to improve initial and ongoing patient engagement for this patient population. Generalizability of this program's results to other settings and populations may be limited, given that the CoCM was conducted with health clinics from an urban academic medical center. The analyses also did not allow investigators to collect data on several factors that may have contributed to patient engagement (or lack thereof). A broader, more impactful application of the model will require research on factors affecting receptivity and engagement in CoCM and may inform improvements of implementation strategies for diverse populations.

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