Medicaid Costs and Utilization of Collaborative Versus Colocation Care for Patients With Depression

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Objective: The authors examined cost and utilization metrics for racially diverse Medicaid primary care patients with depression receiving care through either a collaborative care model (CoCM) of integration or the standard colocation model.

Methods: Data from a retrospective cohort of Medicaid patients screening positive for clinically significant depression during January 2016–December 2017 were analyzed to assess health care costs and selected utilization measures. Seven primary care clinics providing CoCM were compared with 16 clinics providing colocated behavioral health care. Data for the first year and second year after a patient received an initial Patient Health Questionnaire–9 score ≥10 were analyzed.

Results: In the first year, compared with patients receiving colocated care (N=3,061), CoCM patients (N=4,315) had significantly lower odds of emergency department (ED) visits (OR=0.95) and medical specialty office visits (OR=0.92), with slightly higher odds of primary care provider (PCP) visits (OR=1.03) and behavioral health office visits (OR=1.03). In year 2, CoCM patients (N=2,623) had significantly lower odds of inpatient medical admissions (OR=0.87), ED visits (OR=0.84), medical specialty office visits (OR=0.89), and PCP visits (OR=0.94) than the colocated care patients (N=1,838). The two groups did not significantly differ in total cost in both years.

Conclusions: Access to CoCM treatment in primary care for racially diverse Medicaid patients with depression was associated with more positive health care utilization outcomes than for those accessing colocated treatment. As organizations continue to seek opportunities to integrate behavioral health care into primary care, consideration of health care costs and utilization may be helpful in the selection and implementation of integration models.

Psychiatric Services in Advance (doi: 10.1176/appi.ps.20220604)

Access to behavioral health services in primary care has expanded over recent years through the implementation of the collaborative care model (CoCM) (1–5). The CoCM has garnered support at both federal and state levels as an integration strategy to improve outcomes and reduce health disparities for individuals with common behavioral health conditions (6–8). As the CoCM gains traction in primary care, understanding the model's impact on Medicaid costs and care utilization has become important (9).

The CoCM significantly improves clinical outcomes for individuals with depression or anxiety, including those with comorbid medical conditions (6, 10–12). The fidelity of CoCM implementation and patient engagement and satisfaction are additional factors that affect health care utilization metrics, clinical outcomes, and cost-effectiveness (2, 13, 14). Compared with usual care, CoCM improves outcomes and reduces inappropriate care utilization (15, 16). Studies of the CoCM, compared with usual care, for patients with depression have reported a significant reduction in overall health care costs, although these studies had limited samples of low-income and racially diverse patients (17–20). There is also some evidence that certain colocation-type models, such as the primary care behavioral health model, may reduce costs and improve appropriate care utilization (21–23).

HIGHLIGHTS

- Integration of behavioral health into primary care is a national priority for addressing disparities in behavioral health care; the collaborative care model (CoCM) has been promoted as a promising model that has Medicare payment support.
- For Medicaid patients with depression, the CoCM was associated with decreased emergency department visits and inpatient admissions and with more appropriate outpatient care utilization compared with the colocation model.
- The CoCM and the colocation model did not significantly differ in cost.
- This is the first comparative study to analyze health care costs and utilization among Medicaid patients in CoCM and colocation models.

Investments supporting the implementation of integrated care have emerged, including the availability of collaborative care and general integration billing codes, e-consult billing codes, and supplemental payments from some state Medicaid agencies and in alternative payment models (4, 5, 24).

To our knowledge, no studies are available that have analyzed health care costs and utilization by comparing the CoCM with the colocation model of behavioral health integration in primary care. Therefore, we undertook this comparative analysis of low-income, racially diverse Medicaid patients with clinically significant depression symptoms treated at CoCM or colocation sites.

METHODS

In an urban health system serving primarily (>80%) Medicare and Medicaid recipients with significant racial and ethnic diversity (>75% African American and Latino/Latina), the CoCM was implemented at seven clinics serving approximately 100,000 patients annually. Descriptions of CoCM implementation, a prospective subset comparison of clinical outcomes between the CoCM and colocation cohorts, and CoCM main findings have been detailed in two previous studies (7, 10). This study was approved by the institutional review board of the Albert Einstein College of Medicine.

Before the implementation of the CoCM, all 23 primary care sites of the health system maintained a level 3 status with the patient-centered medical home recognition program of the National Committee for Quality Assurance (NCQA) and offered colocated behavioral health care that included standard depression screening and embedded licensed social workers for behavioral health evaluations and short-term psychotherapy with access to psychiatrist consultations (25). Subsequently, seven of these sites implemented the CoCM with care manager support, routine psychiatric case review and consultation, measurement-informed care, stepped care, and registries for tracking patients.

Individuals ages 18–64 years were eligible for inclusion if they sought care at any of the primary care sites, screened positive for clinically significant depressive symptoms by scoring ≥10 on the Patient Health Questionnaire–9 (PHQ-9, available in English and Spanish versions) during the January 2016–December 2017 period, and were enrolled in Medicaid for at least 9 months of the year for 1 year before and up to 2 years after the positive PHQ-9 screen (26, 27). The analysis was limited to Medicaid because complete access to claims was available for the period analyzed. Individuals with cognitive impairment, bipolar disorder, schizophrenia, or any psychotic disorder were excluded.

In the analysis, we attempted to adjust for independent variables such as age, sex, comorbid anxiety, medical diagnoses, and whether clinics had teaching activities that could influence outcomes. Symptomatic comorbid anxiety was considered present if a patient scored >3 on the two-item Generalized Anxiety Disorder (GAD) scale or >8 on the seven-item GAD scale at baseline (28). Comorbid medical conditions were assessed with Charlson Comorbidity Index (CCI) scores, which were calculated by using claims data for all medical diagnoses during the 12 months after the patient's initial positive depression screen (29, 30). A clinic was considered a teaching site on the basis of the presence of medical students and residents performing clinical activities.

The first analysis was a cohort-level (CoCM or colocation) longitudinal model comparing differences in cost and utilization by site in the first year after the patient's initial positive depression screen on the PHQ-9 instrument. The second analysis was conducted with a subgroup of patients for whom a second year of claims was available for analysis. Analyses were conducted with administrative claims data from New York State's Medicaid Data Warehouse through a research data use agreement.

The 1-year follow-up cost variable was the difference in cost per member per year (PMPY) between the year before and the year after a patient's clinically significant PHQ-9 score. The 2-year follow-up cost variable was the difference in PMPY cost between the year before and the second year after the patient's initial positive depression screen on the PHQ-9. Taking the difference in cost from year to year helped normalize the data and reduced the effect of outliers, leading to better model fit. Costs were modeled by using multivariable linear regression, with cohort as the main exposure (CoCM vs. colocation), and these analyses were adjusted for baseline PHQ-9 score, comorbid anxiety, CCI score, age, sex, and teaching site. The following types of utilization were assessed: inpatient medical admissions, inpatient admissions for ambulatory care–sensitive conditions, inpatient behavioral health admissions, emergency department (ED) visits, ED visits for ambulatory care–sensitive conditions, primary care visits, specialty office visits, and behavioral health office visits (31). Utilization outcomes were modeled with Poisson regression with cohort as the main exposure, and the model was also adjusted for baseline PHQ-9 score, comorbid medical conditions, age, sex, teaching site, comorbid anxiety, and costs. All analyses were conducted with RStudio, version 1.0.44. For all significance tests, alpha was set to 0.05.

RESULTS

The descriptive statistics of the two patient cohorts in this study are shown in Table 1. For the year 1 analyses, 4,315 patients were in the CoCM cohort and 3,061 in the colocation cohort. For the year 2 analyses, 2,623 patients were in the CoCM cohort and 1,838 in the colocation cohort. Compared with the sites for the colocation cohort, the CoCM sites had a slightly but statistically significantly older patient population, higher rates of comorbid anxiety symptoms, and a higher proportion of patients seen at teaching sites. We could not reliably determine the proportions of the race classification of patients because of a significant amount of missing data in the claims database, and if the data were present, we could not ascertain how race classifications were

TABLE 1. Comparative descriptive characteristics of the collaborative care model (CoCM) and colocation cohorts

Characteristic	CoCM cohort		Colocation cohort		p
	N	%	N	%	
Year 1					
N of patients	4,315	100	3,061	100	
PHQ-9 score (mean±SD)[a]	15.6±4.3		15.7±4.1		.763
Age (mean±SD years)	41.1±14.0		40.1±15.2		.004
CCI score (mean±SD)[b]	1.9±2.5		1.9±2.5		.579
Comorbid anxiety	3,155	73	1,826	60	<.001
Teaching site	2,539	59	1,137	37	<.001
Sex					.614
Male	1,031	24	715	23	
Female	3,284	76	2,346	77	
Year 2					
N of patients	2,623	100	1,838	100	
PHQ-9 score (mean±SD)[a]	15.7±4.4		15.7±4.1		.777
Age (mean±SD years)	42.0±13.9		40.9±14.9		.007
CCI score (mean±SD)[b]	2.0±2.5		1.9±2.4		.336
Comorbid anxiety	1,896	72	1,075	58	<.001
Teaching site	1,620	62	617	34	<.001
Sex					.546
Male	595	23	402	22	
Female	2,028	77	1,436	78	

[a] PHQ-9, Patient Health Questionnaire–9; scores range from 0 to 27, with higher scores indicating more severe depression.
[b] CCI, Charlson Comorbidity Index; scores range from 0 to 24, with higher scores indicating more severe comorbid conditions.

collected. Nevertheless, we estimate that the racial-ethnic diversity mix was similar to that based on patient self-reported racial-ethnic categorizations in our previous analysis of a slightly larger cohort of patients with depression served in primary care in this health system; approximately 75% of the patients were African American or Latino/Latina, 6% were White, and 19% were other or unclassified race-ethnicity (10).

Table 2 presents the cost estimates and ORs for the CoCM cohort (with the colocation cohort as the reference) for the outcomes tested. We did not detect significant differences in cost between the two groups for either year. However, in year 1, patients at the CoCM sites had significantly lower odds of medical specialty office (0.92, $p<0.001$) and ED (OR=0.95, $p=0.030$) visits and greater odds of primary care (1.03, $p=0.004$) and behavioral health provider (1.03, $p<0.001$) visits compared with those at the colocation sites.

In the year 2 analysis, patients receiving CoCM treatment had lower odds of ED visits (OR=0.84 $p<0.001$), inpatient medical admissions (OR=0.87, $p=0.033$), medical specialty office visits (OR=0.89, $p<0.001$), and primary care visits (OR=0.94, $p<0.001$) than the patients at colocation sites. Patients receiving CoCM treatment tended to have slightly lower odds of behavioral health visits, but this difference was not statistically significant.

DISCUSSION

In this study, we found some support for significant differences in health care utilization between the two care integration models examined. Patients who received CoCM treatment for depression had lower odds of ED and medical specialty office visits in both years 1 and 2 and greater odds of having primary care provider (PCP) and behavioral office visits in year 1 after a depression diagnosis, compared with patients in the colocation model. One can view this finding as more appropriate care utilization for patients with depression who were in CoCM treatment, given the decrease of some higher-cost services and increased PCP and behavioral health visits during which depression treatment was available. Moreover, in the year 2 subgroup, besides the continued findings of lower odds of ED admissions and medical specialty visits, the CoCM cohort had lower odds of medical inpatient admissions, possibly indicating greater health stability and potential cost savings in later years. Supporting this interpretation is our finding in a previously published prospective comparison study of depression outcomes indicating that patients receiving CoCM treatment had a significant 33% greater reduction in PHQ-9 scores at 12 weeks compared with those in the colocation model (7).

Despite the positive findings regarding care utilization, we did not observe significant differences in costs between the two models in years 1 and 2. However, we note that the CIs were large in the cost analyses, suggesting that larger samples would have been needed for any cost differences to reach statistical significance. This result may not be surprising because both the IMPACT (CoCM) and Intermountain (similar to the CoCM in terms of the use of care managers, symptom measurement, and registries) studies found cost differences between CoCM and usual care at 4 years after treatment (17, 20). Additionally, neither study had meaningful numbers of Medicaid patients (<10%) or racial-ethnic minority patients (<10%), and patients were on average 10–15 years older than patients in our analysis, which may have allowed for greater opportunities for cost savings in the previous studies.

We found no peer-reviewed cost and utilization studies that compared the CoCM with colocation models for treating Medicaid patients with depression. This comparison is important because colocation models of integration are prevalent in clinical settings, with one national analysis indicating that 44% of PCPs were colocated with behavioral health providers (32). Anecdotal experience with one state's Medicaid 1115 waiver, which encouraged PCP practices to implement behavioral health integration, showed that 70% of interested practices chose to implement colocation instead of CoCM (personal communication, New York State Office of Mental Health, June 2018). These colocation models often include screening for depression, a

TABLE 2. Comparative cost estimates and care utilization for the collaborative care model (CoCM) and colocation model cohorts[a]

Outcome	Cost estimate or OR	95% CI	p
Year 1			
Change in cost PMPY	$392.59	−$704.48, $1,489.66	.483
Inpatient medical admission	.96	.87, 1.06	.392
Inpatient ambulatory care–sensitive admission	.87	.70, 1.10	.253
Inpatient behavioral health admission	.97	.80, 1.18	.787
Care visit			
ED	.95	.90, .99	.030
ED ambulatory care sensitive	.94	.82, 1.06	.312
Primary care office	1.03	1.01, 1.05	.004
Medical specialty office	.92	.90, .94	<.001
Behavioral health office	1.03	1.02, 1.05	<.001
Year 2			
Change in cost PMPY	−$537.56	−$2,621.08, $1,545.95	.613
Inpatient medical admission	.87	.76, .99	.033
Inpatient ambulatory care–sensitive admission	.76	.57, 1.01	.059
Inpatient behavioral health admission	1.01	.77, 1.32	.957
Care visit			
ED	.84	.79, .90	<.001
ED ambulatory care sensitive	.90	.77, 1.06	.214
Primary care office	.94	.92, .97	<.001
Medical specialty office	.89	.87, .91	<.001
Behavioral health office	.98	.96, 1.00	.052

[a] Estimates and ORs for the CoCM cohort are shown, with the colocation model cohort used as the reference. ED, emergency department; PMPY, per member per year.

licensed behavioral health clinician embedded in the practice (most commonly social work or psychology), psychotropic pharmacotherapy by PCPs with varying availability of psychiatric consultation, and a team-based approach consistent with NCQA's patient-centered medical home models. The CoCM requires more intensive support with the addition of care manager support, measurement-informed care, psychiatric case reviews, stepped care protocols, and the active use of a clinical outcome–tracking tool, such as a registry (8).

As efforts to support behavioral health integration in primary care increase, this study may help policy makers and practitioners make more informed decisions about their integration investments, particularly in medically underserved and racially diverse communities, to achieve positive outcomes for patients with depression.

There were some study limitations. The study was performed only for patients with Medicaid insurance in one health system, and the findings may not be generalizable to patients with other types of insurance and in other types of practices. Moreover, the sample comprised a large majority of African American and Latino/Latina patients and may not be generalizable to other racial demographic communities, although our results may strengthen the case for CoCM implementation in racially diverse communities. Also, we could not compare the CoCM or colocation model with usual care (i.e., with no care integration) in this analysis, because all sites had one of the two models already in place. Because the data were collected and analyzed before the COVID-19 pandemic, it is possible that both the CoCM and colocation model have been adapted in ways, such as through rapid adoption of tele–mental health strategies, that may limit the generalizability of the findings. Although we adjusted for key factors in the analytic model, some unknown factors may have caused the differences in care utilization between the CoCM and colocation model. We did not find significant cost differences between the two models, but because cost data can be significantly skewed, alternative data analyses, such as generalized linear models, might have been useful in supporting these results (33). Finally, we did not assess any potential impact of overdispersion in our analysis, which may have affected the results observed.

CONCLUSIONS

Compared with a colocation model, access to CoCM treatment in primary care for Medicaid patients with depression was associated with improved health care utilization, including decreased ED and medical specialty visits, along with decreased medical inpatient admissions in year 2. As organizations seek new opportunities to integrate behavioral health into primary care, consideration of health care utilization and costs will be useful in determining selection of integration models. Additional comparative clinical and cost analyses of CoCM and colocation models should be undertaken.

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This project was funded by the Centers for Medicare and Medicaid Services through innovation grant 1C1CMS331333.

The authors thank the primary care physicians, psychiatrists, social workers, and patient educators at Montefiore Medical Group who contributed to the integrated care provided to the patients. The authors also acknowledge the New York State Office of Mental Health for its support and collaboration.

The content is solely the responsibility of the authors and does not necessarily represent the official views of the U.S. Department of Health and Human Services or any of its agencies.

Dr. Chung is a consultant to Valera Health, Otsuka Pharmaceuticals, and McKinsey. The other authors report no financial relationships with commercial interests.

Received November 30, 2022; revisions received February 16 and March 16, 2023; accepted March 22, 2023; published online May 24, 2023.

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