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Leung, Lucinda
Chu, Karen
Rose, Danielle
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RESEARCH ARTICLE

Primary care mental health integration to improve early treatment engagement for veterans who screen positive for depression

Lucinda B. Leung MD, PhD, MPH [1,2,3] [ORCID] | Karen Chu MS [1] | Danielle E. Rose PhD [1] | Susan E. Stockdale PhD [1] | Edward P. Post MD, PhD [4,5] | Jennifer S. Funderburk PhD [3,6] | Lisa V. Rubenstein MD, MSPH [2,7]

[1]Center for the Study of Healthcare Innovation, Implementation, & Policy, VA Greater Los Angeles Healthcare System, Los Angeles, California, USA

[2]Division of General Internal Medicine and Health Services Research, UCLA David Geffen School of Medicine, Los Angeles, California, USA

[3]Center for Integrated Healthcare, Syracuse VA Medical Center, Syracuse, New York, USA

[4]VA Ann Arbor, Center for Clinical Management Research, Ann Arbor, Michigan, USA

[5]Department of Medicine, University of Michigan Medical School, Ann Arbor, Michigan, USA

[6]Department of Psychology, Syracuse University, Syracuse, New York, USA

[7]RAND Corporation, Santa Monica, California, USA

Correspondence
Lucinda B. Leung, Division of General Internal Medicine, UCLA David Geffen School of Medicine/VA Greater Los Angeles Healthcare System, 11301 Wilshire Blvd (111G), Los Angeles, CA, 90073, USA.
Email: lleung@mednet.ucla.edu

Abstract

Objective: To examine the relationship between the penetration (or reach) of a national program aiming to integrate mental health clinicians into all primary care clinics (PC-MHI) and rates of guideline-concordant follow-up and treatment among clinic patients newly identified with depression in the Veterans Health Administration (VA).

Data Sources/Study Setting: 15,155 screen-positive patients 607,730 patients with 2-item Patient Health Questionnaire scores in 82 primary care clinics, 2015–2019.

Study Design: In this retrospective cohort study, we used established depression care quality measures to assess primary care patients who (a) newly screened positive (score ≥3) and (b) were identified with depression by clinicians via diagnosis and/or medication ($n = 15,155$; 15,650 patient-years). Timely follow-up included ≥3 mental health, ≥3 psychotherapy, or ≥3 primary care visits for depression. Minimally appropriate treatment included ≥4 mental health visits, ≥3 psychotherapy, or ≥60 days of medication. In multivariate regressions, we examined whether higher rates of PC-MHI penetration in clinic (proportion of total primary care patients in a clinic who saw any PC-MHI clinician) were associated with greater depression care quality

among cohort patients, adjusting for year, healthcare system, and patient and clinic characteristics.

Data Collection/Extraction Methods: Electronic health record data from 82 VA clinics across three states.

Principal Findings: A median of 9% of all primary care patients were seen by any PC-MHI clinician annually. In fully adjusted models, greater PC-MHI penetration was associated with timely depression follow-up within 84 days ($\Delta P = 0.5$; SE = 0.1; $p < 0.001$) and 180 days ($\Delta P = 0.3$; SE = 0.1; $p = 0.01$) of a positive depression screen. Completion of at least minimal treatment within 12 months was high (77%), on average, and not associated with PC-MHI penetration.

Conclusions: Greater PC-MHI program penetration was associated with early depression treatment engagement at 84−/180-days among clinic patients newly identified with depression, with no effect on already high rates of completion of minimally sufficient treatment within the year.

KEYWORDS

access, depression, mental health, primary care, screening, veterans

What is known on this topic

- Effective primary care-based collaborative care models for depression remain difficult to implement and disseminate, with unclear outcomes at the patient population level.

What this study adds?

- This retrospective cohort study examined whether VA's national implementation of Primary Care—Mental Health Integration (PC-MHI) models was associated with improved depression follow-up and treatment engagement among 15,155 screen-positive patients.
- Veterans in clinics where PC-MHI clinicians saw a greater proportion of patients were more likely to engage in depression follow-up within 3-/6-months, but not any more likely to complete minimum treatment in a year.

1 | INTRODUCTION

While there is widespread expectation to screen all adults for depression,[1] treatment opportunities are still missed among primary care populations for various reasons. For example, fewer than half of patients found to newly have depression initiate evidence-based treatment, either psychotherapy or antidepressant medication.[2–4] Patients who initiate treatment may not necessarily receive mental health services in a timely fashion,[5] leading to continued disability and deferred clinical improvement. Collaborative care models support primary care teams to accurately diagnose, effectively treat, and appropriately refer complex or resistant cases for specialty follow-up.[6] Nevertheless, few healthcare systems have been able to pragmatically implement models with sufficient fidelity to models as studied in original research trials.[7] Thus, it remains unclear if primary care team redesign at scale can impact the population-based trajectory from depression screening to follow-up and treatment.

The Veterans Health Administration (VA) has embraced collaborative care models for depression by integrating mental health clinicians

in primary care nationally, also known as Primary Care-Mental Health Integration (PC-MHI). This goal is to help rapidly assess, initiate treatment, and follow-up patients who screened positive for depression.[8] Beginning in 2000, the Mental Health Quality Enhancement Research Initiative (QUERI) contributed largely to VA's pioneering efforts to build capacity and training needed for large-scale PC-MHI design and implementation.[9] To accomplish this, the Mental Health QUERI engaged a national collaboration of primary care and mental health researchers in strategic planning, resulting in both randomized and implementation trials,[10–12] VA mental health measure and data base development,[13,14] and dissemination.[15] Though these early initiatives have concluded, they provided the basis for national spread of PC-MHI in 2007.[16] The inclusion of mental health clinicians (either telephone-based nursing care management or colocated, collaborative care services offered by an embedded mental health clinician) was mandated at nearly all VA primary care clinics,[17] in addition to their availability through traditional referral pathways to outpatient mental health clinics. PC-MHI continues to support primary care clinician assessment and management of mild-to-moderate severity mental

and behavioral health conditions including depression with high mental health quality standards,[18] such as VA's achievement of near universal depression and suicide-risk screening rates in primary care.[19]

Despite national PC-MHI mandates, care models are variably implemented across VA's and quality improvement/research remain necessary to ensure fidelity to evidence-based practices. For example, to facilitate PC-MHI implementation at smaller clinics that lack on-site capacity, one study has used telehealth to meet Veterans' needs for mental health care access.[20] It remains unclear whether the VA's widespread and inconsistent rollout of PC-MHI models improves treatment of patient populations identified with mental health needs, especially those with clinical depression. Few healthcare systems have been able to assess integrated mental health program effects on depression care quality for patients who screen positive at scale. This study builds on prior research using measures for both clinic PC-MHI penetration (the yearly proportion of a clinic's patients who saw a PC-MHI clinicians)[18,21] and depression care quality.[5,22] We aimed to examine whether PC-MHI program penetration in a primary care clinic was associated with higher rates of guideline-concordant follow-up and treatment among clinic patients who newly screened positive and had clinical depression.

2 | METHODS

2.1 | Study design and cohort

In this retrospective cohort study, we identified 607,730 primary care patients ($n = 1,606,632$ patient-years) among 82 VA clinics across eight healthcare systems between October 1, 2015 to September 30, 2019 (fiscal years [FY] 2016 to FY2019). VA electronic data sources included medical records, administrative encounters, and pharmacy databases from the Corporate Data Warehouse (CDW). The Veterans Health Administration consists of approximately 140 VA healthcare systems, which manages 1–2 larger hospital-based clinics (also known as VA medical centers) and several smaller community-based primary care clinics. Our study patients came from 11 hospital- and 71 community-based clinics in Southern California, Arizona, and New Mexico. They received depression screening via the 2-item Patient Health Questionnaire (PHQ-2), which was considered positive if they scored ≥3. The study excluded patients who screened negative ($n = 453,106$; $n = 913,580$ patient-years), who did not return to the same clinic site for primary care during the year ($n = 16,041$; $n = 16,693$ patient-years), who were already engaged in mental health care during the past 6 months ($n = 26,251$; $n = 29,242$ patient-years), and whom clinicians then diagnosed with depression or prescribed an antidepressant during the year ($n = 19,500$; $n = 21,413$ patient-years). Our analytic cohort included 15,155 patients ($n = 15,650$ patient-years) who screened positive and then were identified by clinicians as having depression. (Appendix S1) This study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline. The VA Greater Los Angeles Institutional Review Board approved this study.

Study cohort sociodemographic characteristics were documented in an earlier study.[5] Of the 15,155 patients who screened positive and were then identified by clinicians as having depression, their mean (SD) age was 51.6 (17) years; 13,308 () were men; 7090 (46.8%) were White. Nearly half ($n = 7109$) had comorbid PTSD.

2.2 | Outcome variables

We constructed three depression care quality outcome measures for each study patient. Quality outcomes were established based on VA and National Committee for Quality Assurance (NCQA) guidelines and agreed upon by a modified Delphi panel of VA and non-VA experts.[23] Detailed methods, including diagnostic coding, clinical encounters, and medications, were described in a prior study.[5] The first two outcomes included timely follow-up within 84 days and within 180 days, which was defined as ≥3 mental health specialty visits, or ≥3 psychotherapy visits, or ≥3 primary care visits with a depression diagnosis per the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10). The third measure was completion of at least minimally appropriate treatment, which was defined as having ≥60 days of antidepressant prescriptions, ≥4 mental health specialty visits, or ≥3 psychotherapy visits within 1 year of screening positive.[5,23] We excluded prescriptions with subtherapeutic doses and with non-depression indications. (Appendix S2) Patients were then determined to have received or not received guideline-concordant depression care in each study year.

As reported in a prior study,[5] aggregate rates of follow-up within 84 days, follow-up within 180 days, and completing at least minimally appropriate treatment for our study cohort were as follows: 32.5%, 50.7%, and 77% ($n = 15,650$ patient-years).

2.3 | Exposure variable

We used an established clinic-level measure approximating the penetration (or reach) of PC-MHI programs within each primary care clinic. Obtained from the VA Support Service Center (VSSC), this measure was calculated as the proportion of total primary care patients in a clinic who saw any PC-MHI clinician (e.g., mental health-trained nurse, licensed clinical social worker, psychology, psychiatrist) per study year. Previous studies have demonstrated that PC-MHI penetration rates vary across primary clinics over time[21,24] and can be associated with greater mental health care use,[18] as well as improvements in physical health outcomes.[25]

2.4 | Covariates

We included a comprehensive list of patient and clinic characteristics related to depression care, which were obtained from VA's CDW, National Patient Care Database, Vital Status File, and Site Tracking System. Patient covariates included the following: age, sex,

TABLE 1 Patient and clinic characteristics and depression care quality outcomes by clinic PC-MHI penetration rate.

(n = 15,155)	Total		Seen in clinic below PC-MHI median of 9% (n = 5893)		Seen in clinic above PC-MHI median of 9% (n = 9262)		Difference	
Patient characteristics[a]	n	%	n	%	n	%	n	%
Age (mean/SD)	51.56	17	52.01	16.84	51.28	17.11	−0.73	0.27
Sex								
Men (ref)	13,308	88%	5183	88%	8125	88%	2942	0%
Women	1847	12%	710	12%	1137	12%	427	0%
Race-ethnicity								
White (ref)	7090	47%	2995	51%	4095	44%	1100	−7%
Black	2340	15%	702	12%	1638	18%	936	6%
Hispanic	3277	22%	1224	21%	2053	22%	829	1%
Other	713	5%	315	5%	398	1%	83	−4%
Unknown/Missing	1735	11%	657	11%	1078	12%	421	1%
Marital status								
Married (ref)	6053	40%	2655	45%	3398	37%	743	−8%
Single/previously Married/unknown	9102	60%	3238	55%	5864	63%	2626	8%
Financial means testing								
Exempt from test (ref)	3550	23%	1316	22%	2234	24%	918	2%
Non-exempt from test	1521	10%	590	10%	931	10%	341	0%
Any copay required	1572	10%	692	12%	880	10%	188	−2%
Missing	8512	56%	3295	56%	5217	56%	1922	0%
Service-connected disability								
0% (ref)	384	3%	147	2%	237	3%	90	1%
1%–50%	3180	21%	1260	21%	1920	21%	660	0%
51%–100%	6254	41%	2442	41%	3812	41%	1370	0%
Missing	5337	35%	2044	35%	3293	36%	1249	1%
Charlson comorbidity index								
0 (ref)	9049	57%	3513	60%	5536	60%	2023	0%
1	2949	19%	1155	20%	1794	19%	639	−1%
2+	3157	21%	1225	21%	1932	21%	707	0%
Mental health/substance use disorder								
Anxiety disorder	5807	38%	2093	36%	3714	40%	1621	4%
PTSD	7109	47%	2692	46%	4417	48%	1725	2%
Serious mental illness	697	5%	275	5%	422	5%	147	0%
Alcohol use disorder	2056	14%	720	12%	1336	14%	616	2%
Substance use disorder	1075	7%	343	6%	732	8%	389	2%
Clinic characteristics								
Rurality	911	6%	879	15%	32	0%	−847	−15%
Fewer than 5000 patients	3592	24%	3096	53%	496	5%	−2600	−48%
Community-based	9618	63%	4540	77%	5078	55%	538	−22%
Quality outcomes								
Follow-up with 84 days	4924	32%	1613	27%	3311	36%	1698	9%
Follow-up with 180 days	7676	51%	2733	46%	4943	53%	2210	7%
Minimally appropriate treatment	11,685	77%	4620	78%	7065	76%	2445	−2%

Abbreviation: PTSD, posttraumatic stress disorder.

[a]Numbers represent unique patients. If patients were counted in multiple fiscal years, we reported characteristics associated with the most recent fiscal year (e.g., latest age).

race-ethnicity (i.e., non-Hispanic White, non-Hispanic Black, Hispanic, other, unknown/missing), marital status, and other factors that influence access to VA services (i.e., service-connected disability, exemption from copayment based on having low financial means). We examined race-ethnicity in this study due to previously documented disparities in mental health care access.[5] ICD-10 codes in outpatient and inpatient visits were used to identify mental health diagnoses (i.e., depression, anxiety, posttraumatic stress disorder [PTSD], alcohol and substance use disorders, serious mental illness [specifically, schizophrenia and bipolar disorder]), as well as to calculate Charlson Comorbidity Indices in effort to risk-adjust physical health for each patient during each study year. Clinic covariates included the following: community- versus hospital-based, rural versus urban location, and number of primary care patients (as a proxy for clinic size).

2.5 | Statistical analysis

In descriptive analyses, we examined clinic PC-MHI penetration rate by study year and in total. Patient and clinic characteristics were compared for patients seen in clinics above or below the median PC-MHI penetration rate, using t and χ^2 tests. In multilevel regression models, we examined the effect of clinic PC-MHI penetration on depression care quality, after adjusting for patient and clinic characteristics among all study patients. Year and healthcare system fixed effects allowed us to account for secular trends and invariant organizational characteristics. Patient random effects allowed us to account for the possibility of patients having multiple non-independent observations during the four study years. Standard errors were adjusted to account for clustering of patients within clinics. Given the dichotomous distributions of our quality outcomes, we examined odds ratios and 95% confidence intervals and reported statistical significance based on multivariable logistic regressions. (Appendix S3) For ease of interpretation, estimates were later presented as marginal probabilities (and standard errors calculated via the Delta-method). For a subsample, we examined the effect of PC-MHI penetration rates on depression care quality outcomes lagged by 1 year (e.g., 2016 PC-MHI penetration rate effect on 2017 outcomes). Additional sensitivity analyses were conducted to examine for interactive effects between PC-MHI and select independent variables, including patient gender, clinic size, clinic rurality, and community versus hospital-based clinics, in order to account for potential demographic differences among PC-MHI users.[25,26] For all models, we determined significance by using a 2-tailed $\alpha = 0.05$. Data were analyzed in Stata 15.0 (College Station, TX).

3 | RESULTS

Over the four study years (FY2016-2019), a median 9% of total primary care patients in a clinic saw any PC-MHI clinician (interquartile range = 6%–12% [0%–24%]), which varied over time and across clinics (Appendix S4). In Table 1, bivariate analyses showed that depression care quality differed among patients seen in clinics above or below the median PC-MHI penetration rate of 9%. Aggregate rates of patients receiving timely follow-up care following a positive depression screen were higher in clinics above than below the median PC-MHI penetration (36% vs. 27% within 84 days; 53% vs. 46% within 180 days). Rates of patients completing at least minimally appropriate treatment within 1 year, however, were similar between clinics above than below the median PC-MHI penetration (76% vs. 78%). While patient differences between clinics above than below the median PC-MHI penetration were minimal, organizational differences were notable. Clinics below the median PC-MHI penetration were more often small, rural, and community-based, compared with clinics above the median. (Table 1).

There was a significant association between clinic PC-MHI penetration and timely follow-up care among patients who newly screened positive and who were identified by clinicians as having depression. Each percentage-point increase in the proportion of clinic patients seen by PC-MHI providers was associated with 0.48 percentage-point increase ($\Delta P = 0.48$; SE = 0.1; $p < 0.001$) and 0.28 percentage-point increase ($\Delta P = 0.28$; SE = 0.11; $p = 0.01$) in predicted probability of receiving follow-up within 84 days and in 180 days, respectively. (Marginal probabilities shown in Table 2. Odd ratios shown in Appendix S5.) For example, patients seen in clinics with 10% PC-MHI penetration rate had a higher predicted probability of receiving timely follow-up compared with those seen in clinics with 5% PC-MHI penetration rate (respectively, 32%[0.4%] vs. 30%[0.6%] within 84 days; 50%[0.4%] vs. 49%[0.6%] within 180 days; p's < 0.001; Figure 1).

In lagged regression analyses, PC-MHI effects were observed to be similar for both depression follow-up outcomes, albeit no longer statistically significant given the smaller subsample. We did not observe a PC-MHI effect on the likelihood of completion of at least minimally appropriate treatment within 1 year among study patients, however.

Several other clinic characteristics (clinic size, rurality, community- vs. hospital-based) were significantly associated with depression care quality. Patients in rural clinics had lower rates of timely follow-up within 180 days ($\Delta P = -6.11$; SE = 1.88; $p = 0.001$) and at least minimal treatment completion within one year ($\Delta P = -5.63$; SE = 1.55; $p < 0.001$) than those in non-rural clinics. Patients served in community-based clinics had lower rates of timely follow-up within 84 days ($\Delta P = -3.95$; SE = 0.98%; $p < 0.001$) and within 180 days ($\Delta P = -3.6$; SE = 1.04; $p < 0.001$), but similar rates of treatment completion, compared with hospital-based clinics. Finally, there were no significant effects on depression care quality based on clinic size, nor were there any interactive effects between PC-MHI and these clinic characteristics in sensitivity analyses.

4 | DISCUSSION

Greater PC-MHI program penetration (or reach) in a primary care clinic was associated with earlier (as measured within 84 and 180 days) depression treatment engagement for clinic patients across

TABLE 2 Associations between clinic PC-MHI penetration rate and receipt of timely depression follow-up and treatment.

n = 15,155 (15,650 patient-years)	Follow-up with 84 days			Follow-up with 180 days			Minimally appropriate treatment		
	Marginal probability (percentage-point)	SE	p-Value	Marginal probability	SE	p-Value	Marginal probability	SE	p-Value
Exposure variable									
PC-MHI penetration rate	0.48	0.10	<0.001	0.28	0.11	0.01	−0.12	0.09	0.19
Patient characteristics									
Age									
<35 years (ref)	-	-	-	-	-	-	-	-	-
45–64 years	−1.25	0.93	0.18	−1.86	0.98	0.06	−1.26	0.83	0.13
65–74 years	−6.31	1.11	<0.001	−8.00	1.18	<0.001	−6.24	1.05	<0.001
>75 years	−11.56	1.57	<0.001	−13.94	1.70	<0.001	−9.12	1.54	<0.001
Sex									
Male (ref)	-	-	-	-	-	-	-	-	-
Female	0.21	1.09	0.85	−0.74	1.17	0.53	1.22	1.03	0.24
Race-ethnicity									
White (ref)	-	-	-	-	-	-	-	-	-
Black	2.41	1.07	0.02	3.25	1.14	0.004	0.01	1.01	0.995
Hispanic	0.33	0.94	0.72	0.59	1.00	0.56	−0.67	0.88	0.45
Other	−0.20	1.71	0.91	1.30	1.81	0.47	−2.60	1.66	0.12
Unknown/missing	2.45	1.20	0.04	2.67	1.24	0.03	0.17	1.08	0.88
Marital status									
Married (ref)	-	-	-	-	-	-	-	-	-
Single/previously married/unknown	0.06	0.77	0.94	0.25	0.81	0.75	−2.03	0.71	0.004
Financial means testing									
Exempt from test (ref)	-	-	-	-	-	-	-	-	-
Non-exempt from Test	−1.89	1.59	0.23	1.07	1.70	0.53	−0.30	1.48	0.84
Any copay required	−1.32	1.32	0.32	0.56	1.41	0.69	−0.12	1.22	0.92
Missing	−0.22	1.08	0.84	−0.12	1.14	0.92	0.07	0.99	0.94
Service-connected disability									
0 (ref)	-	-	-	-	-	-	-	-	-
1–50	0.61	2.55	0.81	1.52	2.62	0.56	0.95	2.20	0.66
51–100	−6.47	2.47	0.01	−4.85	2.54	0.06	−0.24	2.14	0.91
Missing	3.79	2.39	0.11	5.04	2.44	0.04	0.65	2.06	0.75
Charlson comorbidity index									
0 (ref)	-	-	-	-	-	-	-	-	-
1	−1.59	0.97	0.1	0.77	1.01	0.44	0.91	0.88	0.30
2+	−3.97	1.03	<0.001	−2.29	1.07	0.03	0.01	0.91	0.99
Mental health/substance use disorder									
Anxiety disorder	14.59	0.70	<0.001	18.70	0.74	<0.001	9.06	0.71	<0.001
PTSD	12.23	0.74	<0.001	18.72	0.76	<0.001	12.77	0.71	<0.001
Serious mental illness	12.01	1.62	<0.001	19.19	2.01	<0.001	11.23	1.90	<0.001
Alcohol use disorder	8.51	1.02	<0.001	9.44	1.16	<0.001	4.41	1.07	<0.001
Substance use disorder	9.36	1.36	<0.001	10.62	1.61	<0.001	6.89	1.52	<0.001

TABLE 2　(Continued)

n = 15,155 (15,650 patient-years)	Follow-up with 84 days			Follow-up with 180 days			Minimally appropriate treatment		
	Marginal probability (percentage-point)	SE	p-Value	Marginal probability	SE	p-Value	Marginal probability	SE	p-Value
Clinic characteristics									
Rurality	0.84	1.92	0.66	−6.11	1.88	0.001	−5.63	1.55	<0.001
Fewer than 5000 patients	0.25	1.40	0.86	1.59	1.47	0.28	1.42	1.29	0.27
Community-based	−3.95	0.98	<0.001	−3.60	1.04	<0.001	0.02	0.93	0.98

Note: Marginal probabilities and standard errors were derived from multilevel logistic regressions that controlled for time (fiscal year), healthcare system, patient characteristics (age, sex, race/ethnicity, marital status, service-connected disability, financial means testing, Charlson Comorbidity Index score, mental health diagnoses), and clinic characteristics (size, rurality, hospital- versus community-based).

Abbreviations: PC-MHI, Primary Care-Mental Health Integration; PTSD, posttraumatic stress disorder.
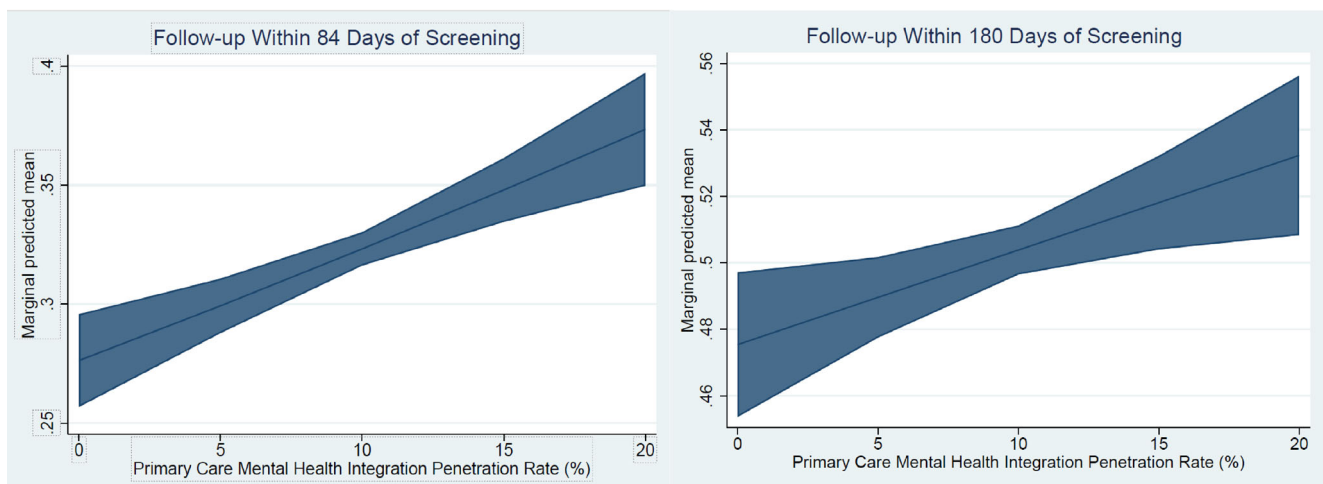
FIGURE 1　Marginal predicted means (with 95% confidence intervals) of receiving timely follow-up care after a positive depression screen at varying clinic PC-MHI penetration, based on significant multivariate regression models. Marginal predicted means (and 95% confidence intervals) at varying clinic penetration of Primary Care–Mental Health Integration (PC-MHI) programs are derived from multilevel logistic regressions that controlled for time (fiscal year), region, patient characteristics (age, sex, race/ethnicity, marital status, service-connected disability, VA means testing, Charlson Comorbidity Index score, mental health diagnoses), and clinic characteristics (size, rurality, hospital- versus community-based).

more than 80 VA sites. In addition to issuing a national VA directive to integrate mental health clinicians, the VA established a national program office to offer primary care clinics education, training, and technical assistance, to disseminate continuous quality improvement tools, and to facilitate local PC-MHI programs and policy development.[27] Other health care systems, like Intermountain Healthcare, have similarly embarked upon system-wide rollout of integrated team-based mental health care with positive outcomes in depression screening, as well as physical health markers downstream.[28] Prior observational research on individual-level data found that veterans receiving same-day PC-MHI care were more likely to initiate treatment within 12 weeks following positive depression screens.[4] Measuring PC-MHI program effects at the clinic level, our study found positive associations with 84 and 180 day follow-up, but no change on albeit already high rates of depression treatment completion within the year. Although some access gaps appear to have narrowed, greater attention to improving collaborative care fidelity may help

ensure that positive research trial outcomes are not diluted at the patient population level.

Patients served in rural and in community-based VA clinics had lower rates of timely follow-up than in urban and in hospital-based clinics. There were no differences in depression care quality by clinic size however. Veterans and others who live in rural areas and receive care in clinics far from hospitals have historically struggled with accessing mental health clinicians, which in turn contribute to known rural disparities in depression care.[29,30] A prior study suggested that when Operation Enduring Freedom and Operation Iraqi Freedom (OEF/OIF) veterans from rural areas utilize mental health services, they were just as likely to receive screening, diagnosis, and treatment for depression as those from urban areas. Our current study included all VA patients and found lower rates of timely follow-up *and* lower rates of treatment completion within 1 year among those served in rural versus urban clinics. To remediate rural disparities in mental health care, tele-mental health interventions have been studied as potential tools.[29,31]

With the expansion of tele-mental health services during the COVID-19 pandemic,[32] future research may examine whether follow-up care and treatment after a positive depression screen have recently improved for rural veterans and nonveterans alike.

While the proportion of integrated mental health clinicians in VA primary care clinics have increased over time, lower PC-MHI penetration rates continue to be associated with VA clinics that were rural, small, and community-based. We found that a median of 9% of primary care patients saw a PC-MHI clinician among our study clinics for fiscal year (FY) 2016–2019. While this median rate appeared low, PC-MHI penetration rates has been noted to have slowly increased over time in prior research—1.1% in FY2009 and 8.2% in FY2013.[21]

While room for improvement among rural and community-based clinics remains, VA investment in PC-MHI programs nationally have been long-standing and continues to evolve in close partnership with research.[20] VA's Mental Health QUERI guided efforts to partner with clinical leaders in preparation for national dissemination and implementation of collaborative care for depression.[16] Similarly, large-scale rollout of collaborative care models in non-VA healthcare systems will also require guideline adherence, structural support (e.g., informatics), training resources, quality monitoring, and leadership buy-in. Future research may similarly utilize collaborative care administrative codes to monitor the implementation, dissemination, and sustainment of this evidence-based practice in VA and other healthcare systems.[33]

This study is the first to examine the effect of VA PC-MHI models on timely follow-up and treatment for primary care patients who screen positive for depression; nonetheless, several limitations are worth noting. First, clinic PC-MHI penetration is an administrative-based measure and may not necessarily reflect fidelity to collaborative care models, nor true integration between primary care and mental health specialty services provided to veterans (care management versus collocation). This variable may be driven in part by potential omitted variables, such sufficiency of mental health staffing. Second, administrative coding inaccuracies may exist, such as inactive depression diagnoses or antidepressant prescriptions without listed indications. Third, our chosen cohort study design does not account for new patients, patient dropouts, or clinic switches. Fourth, as we did not include non-VA data (e.g., Medicare data), results may not generalize beyond our veteran population or primary care patients from the authors' tri-state region. The study team was continuously engaged with regional leaders and was not aware of any PC-MHI related policies or procedural changes regionally or nationally that may have skewed findings during the study period. Finally, future research will need to go beyond existing electronic databases to investigate patient-reported quality outcomes, such as depression symptomatology or quality of life, when available at the population level.

Depression screen-positive VA patients cared for in clinics with greater PC-MHI program penetration appeared to be associated with the intended effect of improving early follow-up. The VA is the largest U.S. healthcare system to embark on and has been a pioneer in mental health integration efforts across primary care clinics. Few population-based studies relating large-scale organizational policy changes aimed at implementing evidence-based mental health practices to changes in routine clinical care have ever been done. Few, if any, have assessed the impacts on the full path from screen positivity to patient engagement in appropriate care across the full population. Thus, important lessons can be drawn from VA's experience. First, increasing treatment initiation when appropriate through timely follow-up is a good initial step, but continued patient engagement toward depression treatment completion remains imperative. Second, increasing the availability and quality of PC-MHI services is a good initial step, but equitable depression care access and continuity across rural and urban areas (also, hospital and community-based clinics) remains imperative. The investment is significant, the timeline is long, but the results from VA's PC-MHI programs are worthwhile for the veteran population at large.

CONFLICT OF INTEREST STATEMENT

No disclosures to report.

ORCID

Lucinda B. Leung https://orcid.org/0000-0002-8103-8611

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.