ORIGINAL RESEARCH

Integrated Care: Treatment Initiation Following Positive Depression Screens

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BACKGROUND: Primary Care-Mental Health Integration (PC-MHI) may improve mental health services access and continuity of care.

OBJECTIVE: To assess whether receipt of integrated PC-MHI services on the date of an initial positive depression screen influences receipt of depression treatment among primary care (PC) patients in the Veterans Health Administration.

DESIGN: Retrospective cohort study.

SUBJECTS: Thirty-six thousand, two hundred and sixty-three PC patients with positive depression screens between October 1, 2009 and September 30, 2010.

MAIN MEASURES: Subjects were assessed for depression diagnosis and initiation of antidepressants or psychotherapy on the screening day, within 12 weeks, and within 6 months. Among individuals with PC encounters on the screening day, setting of services received that day was categorized as PC only, PC-MHI, or Specialty Mental Health (SMH). Using multivariable generalized estimating equations (GEE) logistic regression, we assessed likelihood of treatment initiation, adjusting for demographic and clinical measures, including depression screening score.

KEY RESULTS: Patients who received same-day PC-MHI services were more likely to initiate psychotherapy (OR: 8.16; 95 % CI: 6.54–10.17) and antidepressant medications (OR: 2.33, 95 % CI: 2.10–2.58) within 12 weeks than were those who received only PC services on the screening day.

CONCLUSIONS: Receipt of same-day PC-MHI may facilitate timely receipt of depression treatment.

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INTRODUCTION

Ensuring timely delivery of appropriate treatment for individuals with depressive symptoms is an important health policy objective. Depression is the third leading cause of disability worldwide, and the leading cause in middle and high income countries.[1] In the United States, over 32 million adults have experienced major depressive disorder in their lives,[2] and annual economic costs exceed $80 billion.[3] Depression is associated with increased mortality, including cardiovascular[4] and suicide mortality.[5] In the past decade, there have been focused concerns regarding depression treatment among Veterans, as highlighted in the Comprehensive Veterans Health Administration (VHA) Mental Health Strategic Plan.[6] In particular, the VHA has initiated new programs to enhance mental health services for Veterans seen in primary care (PC) settings.[7]

Enhancing the availability of mental health services in PC settings is necessary because of poor detection of mental health needs,[8] PC provider burden[9] or discomfort with initiating treatment,[10] and patient reluctance to engage in specialty mental health (SMH) clinic services.[11–13] Recognizing the public health burden of depression, health systems are increasingly screening patients, which may improve detection of depression.[14,15] Nonetheless, without a coordinated effort to enhance treatment for patients who screen positive, screening alone will likely do little to improve depression course and outcomes.[15] Consequently, the United States Preventive Services Task Force recommends screening adults for depression in PC settings when there are mechanisms in place for diagnosis, treatment, and follow-up of these patients.[14]

In the VHA, depression screening is required annually for patients without ongoing depression or bipolar disorder diagnoses.[16] Provider compliance with this requirement is high; for example, in fiscal year (FY) 2010, 97 % of eligible patients received depression screening.[17] However, it is unclear to what extent individuals who screen positive receive timely access to depression-related treatment.[18]

Since 2007, VHA initiatives have supported integration of mental health resources into PC practices (known as Primary Care-Mental Health Integration; PC-MHI). PC-

MHI programs are distinct additions to PC clinics, designed to enhance detection and treatment of depression and other mental health conditions that have high prevalence in that setting. The VHA now requires Veterans Affairs (VA) Medical Centers and Community Based Outpatient Clinics serving 5,000 or more patients to include both co-located collaborative care and care management as part of their PC-MHI programs,[19] although not all sites currently have both components.[7,20] Co-located collaborative care typically involves licensed independent mental health providers physically located within PC clinics, working collaboratively with primary care providers. Care management is often provided by registered nurses and involves structured assessments, patient education and referral management.[21] PC-MHI services may follow an open-access model that allows for immediate referral of patients with mental health needs.[22] The specific program structure and services offered vary between facilities; some specifically refer all positive depression screens to their PC-MHI programs and some allow patients to refer themselves.[20] Nearly every VA Medical Center and most of the very large Community Based Outpatient Clinics have programs.[20] As of May 2012, over 600,000 patients have been served by these programs in more than two million encounters (VHA PC-MHI Evaluation, unpublished data). Program implementation has been associated with increased prevalence of depression diagnoses in PC settings, presumably resulting from enhanced detection.[23] To date, however, no study has examined whether, among individuals without a current depression diagnosis or treatment, receipt of PC-MHI services on the day of a positive depression screen is associated with initiation of depression treatment.

The availability of same-day PC-MHI services within PC settings may enhance patient receipt of depression treatment. PC-MHI services may include prescribing antidepressants, delivering psychotherapy, and supporting PC providers' initiation of treatment and referrals for specialty mental health services. PC-MHI has been found to reduce patients' experience of mental health stigma and to increase identification and treatment of mental health conditions.[20] We hypothesized that PC patients who receive PC-MHI services on the day of their positive depression screen would be more likely to initiate depression treatment (i.e., antidepressant medication treatment, psychotherapy) than patients with positive depression screens in PC settings who did not receive same-day PC-MHI or SMH services. This study evaluated associations between indicators of the settings where patients received care on the day of the initial positive screens and initiation of depression-related treatment. Specifically, we assess whether patients with same-day PC-MHI services were more likely to receive depression treatment within 12 weeks, as compared to similar patients who did not receive same-day PC-MHI services. In sensitivity analyses, we assess treatment initiation on the day of the screen, within 7 days of the screen, and up to 6 months post-screen. Separately, we limit

analyses to individuals who received a depression diagnosis on the screening date. These analyses allow us to examine patterns of receipt across groups over time.

METHODS

Sample

For a 30 % random sample of fiscal year (FY) 2010 PC users, FY 2010 depression screening assessments in the VHA Corporate Data Warehouse (CDW) were matched to patient administrative records from the National Patient Care Database (NPCD) and pharmacy records from VHA Decision Support Services (DSS). The CDW data contains the date of depression screening and screening scores. The NPCD contains records for all VHA outpatient healthcare encounters, including the type of clinic visited, diagnoses, and procedures related to that encounter. The NPCD also has similar information for inpatient stays. DSS pharmacy data contains records for all prescriptions dispensed by VHA pharmacies.

Individuals were eligible for the study if they met the following criteria: 1) were included in the 30 % random sample; 2) had a positive depression screen in FY 2010; 3) received primary care services on the screen day; 4) VHA records did not indicate a depression diagnosis, filled antidepressant prescription, or psychotherapy visit (for any reason) in the year prior to the depression screen; and 5) were at least 18 years old on the screen date. In the VHA, depression screening is required annually, but only for patients without a depression diagnosis or treatment in the prior year. Patient Health Questionnaire (PHQ) scores for patients with a recent depression diagnosis or treatment probably represent ongoing assessment rather than a true screening and are excluded; resulting in a more homogeneous population of PC patients with newly identified depressive symptoms.

This project was approved by the Institutional Review Board of the VHA Ann Arbor Healthcare System.

Measures

As recommended by the instruments' authors, a positive depression screen was identified based on a score of ≥10 on the PHQ-9[24] or ≥3 on the PHQ-2,[25] which consists of the first two items of the PHQ-9. Depression diagnoses were indicated by the presence of any of the following *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD9-CM) codes recorded in primary or secondary diagnosis fields in NPCD inpatient or outpatient datasets: 293.83, 296.2x, 296.3x, 296.90, 296.99, 298.0x, 300.4x, 301.12, 309.0x, 309.1x or 311.x. Receipt of psychotherapy was identified by Current Procedural Terminology (CPT) codes 90804–90815, 90845, 90847, 90853 and 90857 in any field of the outpatient or inpatient

encounters data sets. Antidepressant medications included as evidence of prior or subsequent treatment were phenelzine, tranylcypromine, bupropion, citalopram, fluoxetine, paroxetine, sertraline, venlafaxine, escitalopram, fluvoxamine, and isocarboxazid. Tricyclic antidepressants were not included in this analysis, because they are often used for pain or sleep indications, rather than depression. Three indicators of depression treatment were assessed: antidepressant treatment, psychotherapy treatment, or any treatment (either antidepressants or psychotherapy). We identified depression diagnoses and treatment at four time points: the date of the positive depression screen and within 7 days, 12 weeks and 6 months.

Covariates included measures of patient sociodemographics (age, sex, race, ethnicity, marital status, service-connected disability status); utilization (VHA services use in the prior year); comorbid mental health conditions (anxiety, post-traumatic stress disorder (PTSD), serious mental illness [SMI], substance use disorder [SUD] or other mental health conditions); and baseline PHQ-2 score (calculated from the first two items of the PHQ-9, for individuals screened with the PHQ-9 instrument). We assessed whether highest recorded military service-connected disability rating was at least 70 %, as having a high degree of service-connected

disability indicates higher morbidity[26] and increased access to VHA services.[27] Comorbid mental health conditions were identified using the following ICD9-CM diagnosis codes: anxiety (308, 300.01, 300.02, 300.2, 300.3, 300.00, 300.09), PTSD (309.81), SMI (295.1, 295.2, 295.3, 295.4, 295.6, 295.9, 295.7, 296.0, 296.1, 296.4, 296.5, 296.6, 296.7, 296.8, 297.1, 297.3, 298.0, 298.8, 298.9), SUD (303, 304, 305 excluding 305.1), and other (all non-depression diagnosis codes from 290 to 319 that were not indicated above).

We assessed the type of services received on the index date of positive depression screens using established identifiers included in the outpatient encounters data set for PC, PC-MHI, and SMH. Services received on the date of positive screens were categorized according to the most specialized service received (e.g., a patient seen in both PC-MHI and SMH was categorized as SMH). The three levels of the location variable were PC only, PC-MHI, and SMH.

Statistical Analysis

Descriptive statistics, including means and frequencies, were used to describe the sample. Differences between the

Table 1. Characteristics of Primary Care Patients with Positve Depression Screen, FY 2010

	Overall	PC	PC-MHI	SMH
	(N=36,263)	(N=30,461)	(N=3,279)	(N=2,505)
	N (%)	N (%)	N (%)	N (%)
Age group			**	**, ‡
≤44	7,749 (21.4)	5,676 (18.6)	1,070 (32.5)	1,003 (40.0)
45–64	19,557 (53.9)	16,561 (54.4)	1,753 (53.2)	1,243 (49.6)
≥65	8,957 (24.7)	8,224 (27.0)	474 (14.4)	259 (10.3)
Sex				
Female	2,278 (6.3)	1,838 (6.0)	251 (7.6)**	189 (7.5)**
Race				*
White	23,723 (65.4)	19,901 (65.3)	2,152 (65.3)	1,670 (66.7)
African American	5,887 (16.2)	4,916 (16.1)	549 (16.7)	422 (16.9)
Other	1,129 (3.1)	935 (3.1)	106 (3.2)	88 (3.5)
Unknown	5,524 (15.2)	4,709 (15.5)	490 (14.9)	325 (13.0)
Hispanic	1,550 (4.3)	1,289 (4.2)	138 (4.2)	123 (4.9)
Marital Status			**	**, ‡
Married	18,188 (50.2)	15,581 (51.2)	1,536 (46.6)	1,071 (42.8)
Not Married	11,189 (30.9)	9,478 (31.1)	991 (30.1)	720 (28.7)
Never Married	6,464 (17.8)	5,048 (16.6)	739 (22.4)	677 (27.0)
Unknown	422 (1.2)	354 (1.2)	31 (0.9)	37 (1.5)
Service Connected 70 %	4,304 (11.9)	3,760 (12.3)	322 (9.8)**	222 (8.9)**
Prior Mental Health Diagnoses				
Anxiety	841 (2.3)	673 (2.2)	103 (3.1)**	65 (2.6)
PTSD	1,287 (3.5)	1,030 (3.4)	137 (4.2)*	120 (4.8)**
SMI	329 (0.9)	248 (0.81)	37 (1.1)	44 (1.8)**, †
SUD	1,486 (4.1)	1,195 (3.9)	138 (4.2)	153 (6.1)**, ‡
Other	1,363 (3.8)	1,255 (4.1)	15 (4.7)	93 (3.7)
Any prior MH diagnosis	4,543(12.5)	3,716 (12.2)	460 (13.9)*	367 (14.6)**
No prior VHA OP use	10,036 (27.7)	8,027 (26.4)	1,033 (31.3)**	976 (39.0)**, ‡
PHQ-2 Score*	4.63 (1.34)	4.61 (1.34)	4.66 (1.39)	4.80 (1.32)**, ‡

PC Primary Care, PC-MHI Primary Care-Mental Health Integration, SMH Specialty Mental Health, PTSD Posttraumatic Stress Disorder, SMI serious mental illness; SUD substance use disorder, MH Mental Health, VHA Veterans Health Administration, PHQ Patient Health Questionnaire
All items presented as N (%), except PHQ-2 score, presented as mean (SD)
*p< 0.05 compared to PC only
† p< 0.05 compared to PC-MHI
‡ p< 0.001 compared to PC-MHI
** p< 0.001 compared to PC only

groups were calculated using chi-square and T-tests. Using multivariable generalized estimating equations (GEE) logistic regression, we assessed associations between the location of services on the screening date and the likelihood of receiving psychotherapy, antidepressant medications, or either treatment within 12 weeks. Analyses controlled for patient sociodemographic characteristics, baseline PHQ-2 score, comorbid mental health conditions and receipt of VHA outpatient services in the prior 12 months. The GEE model used an independent correlation matrix to account for similarities in treatment of patients within sites, and robust variance estimates to allow for misspecification of the correlation structure.

We conducted several sensitivity analyses. First, we performed the logistic regressions including treatment within 7 days and within 6 months, to assess how the follow-up period may affect the results. Second, we limited the analysis to those individuals diagnosed with depression on the screening date. Finally, we completed GEE models stratified by a facility-level measure of access to PC-MHI services, categorizing sites as above or below the median prevalence of receipt of PC-MHI services among PC patients in FY2010 (5.19 %). All analyses were performed using SAS 9.2 (SAS Institute, Inc., Cary, NC).

RESULTS

Thirty-six thousand, two hundred and sixty-three patients met eligibility for study inclusion. Table 1 summarizes the demographic and clinical characteristics for patients with positive depression screens, overall and by category of services received on the screen date. Compared to patients seen in PC-MHI, PC only patients tended to be older (27 % vs. 14 % at least 65 years old), were more likely to be male (94 % vs. 92 %), were more likely to be married (51 % vs. 47 %), were more likely to be service connected (12.3 % vs. 9.8 %), were less likely to have a prior mental health diagnosis (12.2 % vs. 13.9 %), and had lower baseline PHQ-2 scores (4.61 vs. 4.66).

Table 2 presents information on depression diagnosis and treatment among those who screened positive, by setting. A greater percentage of patients with either PC-MHI or SMH were diagnosed with depression on the same day (67.9 % and 60.3 %, respectively), compared with patients seen in PC only (29.9 %). By 6 months, the probability of diagnosis had increased in all groups; nonetheless, PC only patients had the lowest percentage of depression diagnoses (44.4 %). Patients in PC only had the lowest probability of treatment initiation at each of the time periods; 40.6 % received any treatment within 6 months, but 49.3 % of patients with same-day PC-MHI initiated treatment on the screening date.

Table 2. Cumulative Prevalence of Depression Diagnosis and Treatment, by Location of Services, PC Patients with Positive Depression Screens

	Time from positive depression screen to event			
	Same day	≤7 days	≤12 weeks	≤6 months
	N (%)	N (%)	N (%)	N (%)
	Depression diagnosis			
PC	9,096 (29.9)	9,686 (31.8)	12,489 (41.0)	13,528 (44.4)
PC-MHI	2,237 (67.9)	2,294 (69.58)	2,513 (76.2)	2,579 (78.2)
SMH	1,511 (60.3)	1,577 (63.0)	1,792 (71.5)	1,853 (74.0)
	Psychotherapy initiation			
PC	116 (0.4)	713 (2.34)	5,683 (18.7)	7,547 (24.8)
PC-MHI	1,262 (38.3)	1,417 (43.0)	2,203 (66.8)	2,336 (70.8)
SMH	869 (34.7)	1,013 (40.4)	1,670 (66.7)	1,805 (72.1)
	Antidepressant initiation			
PC	1,859 (6.1)	4,778 (15.7)	8,145 (26.7)	9,454 (31.0)
PC-MHI	599 (18.2)	1,008 (30.6)	1,603 (48.6)	1,754 (53.2)
SMH	439 (17.5)	800 (31.9)	1,228 (49.0)	1,351 (53.9)
	Any treatment initiation			
PC	1,962 (6.4)	5,271 (17.3)	10,664 (35.0)	12,365 (40.6)
PC-MHI	1,624 (49.3)	1,967 (59.7)	2,612 (79.2)	2,700 (81.9)
SMH	1,128 (45.0)	1,442 (57.6)	1,977 (78.9)	2,064 (82.4)

PC Primary Care, PC-MHI Primary Care-Mental Health Integration, SMH Specialty Mental Health

Table 3 presents the multivariable GEE logistic regression analyses. Being seen in PC-MHI or SMH on the day of the depression screen increased the probability of receiving both psychotherapy and antidepressant treatment. For example, compared with patients seen in PC only, patients seen in PC-MHI had 8.16 (95 % Confidence Interval [CI]: 6.54–10.17) times greater odds of receiving psychotherapy, 2.33 (95 % CI: 2.10–2.58) times greater odds of having an antidepressant prescription fill, and 6.60 (95 % CI: 5.32–8.18) times greater odds of initiating either treatment. In addition, patients who were older, service connected, or unmarried were less likely than younger, non-service connected, or married patients to receive treatment with antidepressants, psychotherapy, or either. Higher PHQ-2 scores and no prior VHA outpatient use were associated with more treatment with antidepressants and psychotherapy. We reran the logistic regression with PC-MHI set as the reference category. This showed that the odds ratios for SMH were significantly less than PC-MHI for psychotherapy and either treatment at 12 weeks.

In sensitivity analyses extending to 6 months (available online), the estimated effects of setting were similar, yet slightly attenuated (e.g., the odds of receiving any treatment among patients with PC-MHI was 6.08 [95 % CI: 4.91–7.53] compared to PC only), while in sensitivity analyses including treatment within 7 days, the associations of location on psychotherapy receipt were even greater (e.g., the odds of receiving psychotherapy among patients with

Table 3. Results of Multivariable Logistic Regression Analyses: Adjusted Odds Ratio for Initiation of Treatment Within 12 Weeks

	Psychotherapy	Antidepressant	Either Treatment*
	OR (95 % CI)	OR (95 % CI)	OR (95 % CI)
Location			
PC	REF	REF	REF
PC-MHI	8.16 (6.54–10.17)	2.33 (2.10–2.58)	6.60 (5.32–8.18)
SMH	7.18 (6.20–8.32)	2.17 (1.93–2.43)	5.76 (4.87–6.80)
Age group			
≤ 44	REF	REF	REF
45–64	0.63 (0.58–0.68)	0.66 (0.61–0.71)	0.60 (0.56–0.65)
≥ 65	0.27 (0.24–0.30)	0.35 (0.33–0.39)	0.29 (0.27–0.32)
Gender			
Female	REF	REF	REF
Male	0.91 (0.81–1.02)	0.74 (0.67–0.82)	0.78 (0.70–0.87)
Race			
White	REF	REF	REF
African American	0.99 (0.90–1.09)	0.91 (0.84–1.00)	0.93 (0.86–1.01)
Other	0.93 (0.78–1.12)	0.72 (0.61–0.87)	0.80 (0.69–0.94)
Unknown	0.86 (0.78–0.96)	0.90 (0.84–0.97)	0.94 (0.87–1.00)
Hispanic	0.97 (0.83–1.13)	0.97 (0.84–1.11)	0.97 (0.85–1.11)
Marital Status			
Married	REF	REF	REF
Not Married	0.92 (0.86–0.97)	0.94 (0.89–1.00)	0.95 (0.90–1.00)
Never Married	0.89 (0.82–0.97)	0.86 (0.80–0.92)	0.89 (0.83–0.96)
Unknown	1.09 (0.85–1.40)	0.94 (0.75–1.18)	0.94 (0.73–1.22)
Service Connected 70 %	0.90 (0.82–0.98)	0.83 (0.76–0.90)	0.85 (0.79–0.92)
PHQ-2 Score	1.11 (1.09–1.14)	1.14 (1.11–1.16)	1.14 (1.12–1.16)
No prior VHA OP use	1.51 (1.41–1.62)	1.48 (1.40–1.57)	1.64 (1.54–1.75)
Comorbid Conditions			
Anxiety	1.15 (0.95–1.38)	0.93 (0.79–1.10)	1.06 (0.90–1.25)
PTSD	1.11 (0.97–1.28)	0.81 (0.70–0.93)	0.94 (0.83–1.07)
SMI	1.10 (0.85–1.43)	0.41 (0.28–0.60)	0.74 (0.57–0.96)
SUD	1.01 (0.88–1.16)	0.70 (0.62–0.80)	0.85 (0.76–0.95)
Other	0.98 (0.85–1.13)	0.87 (0.77–0.99)	0.92 (0.82–1.04)

OR odds ratio, CI confidence interval, PC Primary Care, PC-MHI Primary Care-Mental Health Integration, SMH Specialty Mental Health, PHQ Patient Health Questionnaire
*Any treatment refers to receipt of antidepressants, psychotherapy, or both

PC-MHI was 29.27 [95 % CI: 22.08–38.79] compared to PC only). When the analysis was limited to individuals who were diagnosed with depression on the screening date (available online), the odds of receiving any treatment in PC-MHI settings were 3.61 times greater (95 % CI: 2.87–4.55) than in PC only. Finally, in both analyses that were restricted to individuals at facilities with above versus below median levels of PC-MHI receipt, PC-MHI was associated with greater likelihood of receiving treatment. The adjusted odds ratio for receiving treatment was 5.90 (95 % CI: 4.55–7.65) at above median sites and 10.21 (95 % CI: 7.05–14.79) at below median sites.

DISCUSSION

Key goals of PC-MHI services are to enhance mental health services access for Veterans served within primary care settings and to facilitate treatment coordination and continuation. To date, little is known regarding associations between depressive symptom screening assessments and subsequent initiation of depression-related treatment. In multivariable analyses, we observed that among individuals seen in primary care on the day of a positive depression screen, those who received same-day PC-MHI services were more likely to initiate depression-related treatment than were those receiving only PC services. Same-day PC-MHI services may facilitate treatment initiation and aid in treatment engagement. We note that the association between same-day PC-MHI services receipt and treatment initiation was greater in the follow-up period through 12 weeks than through 6 months. For both periods, however, same-day PC-MHI services receipt was a significant predictor of treatment initiation.

Patients might benefit from being referred to PC-MHI clinics when depression is suspected or immediately following a positive depression screen in primary care. We note that same-day access to PC-MHI services typically involves PC-MHI providers being co-located in primary care and working collaboratively with primary care providers. Lacking such resources, primary care providers may be less willing to initiate treatment and patients may be less willing to accept referrals to specialty mental health providers.

Study findings suggest the benefit of the availability of same-day PC-MHI services. In this study, same-day PC-

MHI was recorded among 9 % of primary care patients with positive depression screens. The availability of same-day PC-MHI services may be expected to increase over time, given ongoing VHA implementation activities.

This observational study had four principal limitations. First, it was not possible to randomly assign patient receipt of same-day PC-MHI services, and those who received same-day PC-MHI services may have differed from other patients in their unmeasured treatment needs and willingness to engage in depression treatment. Nonetheless, mean PHQ-2 scores did not differ between those who received same-day PC-MHI and those seen in PC only. Further, sensitivity analyses limited to patients with a depression diagnosis on the screen date also indicated that same-day PC-MHI was associated with greater likelihood of treatment initiation. We also compared relationships at sites with above-median versus below-median PC-MHI program access scores. In both settings, receipt of same-day PC-MHI was associated with increased treatment initiation: At sites with below-median access, the odds ratio for PC-MHI was 10.21 (95 % CI: 7.05–14.79); at those with above-median access the odds ratio was 5.90 (95 % CI: 4.55–7.65).

Second, we note that a positive screen is not equivalent to a diagnosis of depression, and it is uncertain what percentage of patients who receive positive screens should initiate depression-related treatment.

Third, we include all prescriptions for the selected antidepressants as indicative of depression treatment, although some could be prescribed for other indications (e.g., bupropion for smoking cessation.) Therefore, analyses may omit individuals based on their having received these medications prior to a positive depression screen, and there may be some mis-categorization of depression-related treatment. However, we do not expect this to introduce systematic bias.

Fourth, study findings may not be generalizable to non-VHA settings. The VHA is the largest integrated health system in the United States, with national support for PC-MHI services implementation.[7] Also, this study was focused on individuals with positive depression screens who were not already receiving depression-related treatment. Consequently, study findings may not generalize to patients who were receiving these treatments prior to a positive depression screen.

Study findings suggest that the decisions made by patients and providers at the time that a patient screens positive for depression are associated with the likelihood of treatment initiation, adherence, and overall engagement. Patients who were seen in PC only settings on the date of their positive screen were less likely to be treated within the next 6 months, whereas those who also received PC-MHI services on the screen date were substantially more likely to initiate treatment. Integrated care programs are one way for healthcare systems to potentially enhance the treatment of depression by providing primary care patients with timely treatment and follow-up. This study indicates important benefits of access to same-day PC-MHI services for patients with positive depression screens. Ensuring access to timely depression treatment is an important health system policy objective, and this study suggests that PC-MHI enhances realization of this objective. Future research on the effectiveness of PC-MHI for the treatment of newly detected mental health conditions among the PC population could examine the impact of other mandated screens, such as PTSD or substance use disorders.

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