Treatment Initiation Following Positive Depression Screens in Primary Care: a Propensity Score–Weighted Analysis of Integrated Mental Health Services

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J Gen Intern Med 36(2):561–3

DOI: 10.1007/s11606-020-05694-5

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In 2007, the Veterans Health Administration (VHA) began national implementation of Primary Care–Mental Health Integration (PCMHI) services. A major goal was to enhance mental health access and address unmet treatment needs. Integrated care services have been shown to improve depression identification¹ and enhance engagement in specialty mental health treatment.²

Szymanski et al. examined a sample of VHA users in fiscal year (FY) 2010 and documented positive associations between receipt of PCMHI services on the day of a positive depression screen and initiation of depression treatment within 12 weeks.³ The authors noted as a study limitation that individuals who had received same-day PCMHI services may have had unmeasured differences in symptom severity or willingness to initiate depression treatment, as compared with other study patients.³ Also, in the years since 2010, VHA implementation of PCMHI services has expanded substantially. The present analysis re-evaluates the influence of same-day PCMHI services on initiation of depression treatment, for a more recent period and adjusting for patient propensity to have received PCMHI and/or Specialty Mental Health (SMH) clinic services on the day of the initial positive depression screen in primary care (PC).

METHODS

For FY2017 data, we applied methods from the FY2010 study,³ adding use of propensity score weights to adjust for patient likelihood of receiving same-day PCMHI and/or SMH

services.^{4, 5} Generalized boosted models^{4, 5} were used to create the weights, with location of same-day services as the outcome. Separate propensity score–weighted logistic regressions assessed initiation within 12 weeks of antidepressant pharmacotherapy, psychotherapy, and either treatment.⁴

Analyses used SAS (version 9.3) and R software (version 3.4.2). The study was conducted as part of ongoing operations in the VHA Office of Mental Health and Suicide Prevention.

RESULTS

Table 1 presents sample characteristics, by type of services received. Compared with patients receiving same-day PCMHI, the “PC only” patients were older (38.4% vs. 23.1% were 65+ years old); less likely to be Hispanic (7.7% vs. 8.9%); more likely to be male (87.8% vs. 85.7%), married (49.2% vs. 45.8%), with a prior mental health diagnosis (16.7% vs. 13.3%) and prior VHA outpatient use (67.1% vs. 64.6%); and had lower baseline PHQ-2 (Patient Health Questionnaire) scores (4.64 vs. 4.83).

Table 2 presents the multivariable logistic regression analyses with propensity score adjustment. Compared with patients seen only in PC, patients receiving same-day PCMHI had 9.36 (95% CI, 8.75–10.00) times greater odds of receiving psychotherapy, 2.46 (95% CI, 2.30–2.62) times greater odds of receiving an antidepressant prescription fill, and 7.73 (95% CI, 7.20–8.30) times greater odds of receiving either treatment, all within 12 weeks of the initial screen.

DISCUSSION

Patients receiving same-day PCMHI have greater odds of initiating timely depression treatment. This was observed even when adjusting for observed likelihood of receiving these services, per available measures of morbidity and utilization. Findings support prioritization of efforts to enhance same-day PCMHI access, including support for collaboration between PC and PCMHI providers, for patients with positive depression screens.

Received January 24, 2020

Accepted January 31, 2020

Published online June 3, 2020

Table 1. Characteristics of Primary Care Patients with Positive Depression Screen, FY2017

	Overall (N = 92,535) N (%)	Same-Day Mental Health Care Receipt			
		None, Primary Care Only (N = 76,564) N (%)	PCMHI (N = 6,748) N (%)	PCMHI and SMH (N = 5,625) N (%)	SMH (N = 3,598) N (%)
Age			**	**	** , ‡
≤ 44	25,037 (27.1)	18,539 (24.2)	2,732 (40.5)	2,327 (41.4)	1,439 (40.0)
45 - 64	34,627 (37.4)	28,617 (37.4)	2,459 (36.4)	2,065 (36.7)	1,486 (41.3)
≥ 65	32,871 (35.5)	29,408 (38.4)	1,557 (23.1)	1,233 (21.9)	673 (18.7)
Sex					
Female	11,599 (12.5)	9,366 (12.2)	966 (14.3)**	751 (13.4)*	516 (14.3)**
Race			**		** , ‡
White	59,211 (64.0)	49,235 (64.3)	4,330 (64.2)	3,571 (63.5)	2,075 (57.7)
African American	23,320 (25.2)	19,044 (24.9)	1,660 (24.6)	1,444 (25.7)	1,172 (32.6)
Other	4,616 (5.0)	3,757 (4.9)	405 (6.0)	281 (5.0)	173 (4.8)
Unknown	5,388 (5.8)	4,528 (5.9)	353 (5.2)	329 (5.9)	178 (5.0)
Hispanic	7,369 (8.0)	5,927 (7.7)	598 (8.9)*	565 (10.0)**	279 (7.8)
Marital status			**	**	** , ‡
Married	44,568 (48.2)	37,688 (49.2)	3,092 (45.8)	2,517 (44.8)	1,271 (35.3)
Not Married	31,685 (34.2)	26,221 (34.3)	2,240 (33.2)	1,856 (33.0)	1,368 (38.0)
Never Married	14,969 (16.2)	11,613 (15.2)	1,312 (19.5)	1,142 (20.3)	902 (25.1)
Unknown	1,313 (1.4)	1,042 (1.4)	104 (1.5)	110 (2.0)	57 (1.6)
Service connected					
70+%	36,386 (39.3)	30,149 (39.4)	2,600 (38.5)	2,101 (37.4)*	1,536 (42.7)** , ‡
Mental Health diagnoses in prior year					
Anxiety	3,909 (4.2)	3,133 (4.1)	254 (3.8)	250 (4.4)	272 (7.6)** , ‡
PTSD	8,915 (9.6)	7,368 (9.6)	466 (6.9)**	388 (6.9)**	693 (19.3)** , ‡
SMI	1,875 (2.0)	1,393 (1.8)	82 (1.2)**	89 (1.6)	311 (8.6)** , ‡
SUD	2,529 (2.7)	1,887 (2.5)	130 (1.9)*	158 (2.8)	354 (9.8)** , ‡
Other	2,780 (3.0)	2,185 (2.9)	192 (2.9)	177 (3.2)	226 (6.3)** , ‡
Any of the above	15,893 (17.2)	12,805 (16.7)	898 (13.3)**	856 (15.2)*	1,334 (37.1)** , ‡
Number of PC encounters in prior 12 months[^]	3.04 (4.31)	3.21 (4.40)	2.03 (3.42)**	2.13 (3.56)**	2.71 (4.56)** , ‡
No prior VHA outpatient use	31,016 (33.5)	25,204 (32.9)	2,386 (35.4)**	2,062 (36.7)**	1,364 (37.9)** , ‡
PHQ-2 Score[^]	4.68 (1.23)	4.64 (1.23)	4.83 (1.19)**	4.89 (1.19)**	4.86 (1.21)**

[^]Presented as mean (SD)

* $p < 0.05$ compared to PC only

‡ $p < 0.05$ compared to PCMHI only

‡ $p < 0.001$ compared to PCMHI only

** $p < 0.001$ compared to PC only

Study findings are consistent with those reported for FY2010,³ with FY2017 sensitivity analyses without propensity score weights, and with other assessments of the impact of same-day integrated care services. A national VHA study examining patients with a positive PC-PTSD screen found that same-day PCMHI services were associated with greater PTSD treatment initiation compared

to patients receiving only PC services.⁶ This work extends previous findings demonstrating the effectiveness of PCMHI on diagnosis and treatment of common mental health conditions by providing propensity score-adjusted evidence of the value of same-day PCMHI for depression treatment facilitation.

Table 2 Adjusted Odds Ratios for Treatment Initiation Within 12 Weeks of Initial Positive Depression Screen*

	Psychotherapy			Antidepressant			Either treatment		
	OR	95% CI LL	95% CI UL	OR	95% CI LL	95% CI UL	OR	95% CI LL	95% CI UL
Location									
PC only	Ref			Ref			Ref		
PCMHI	9.36	8.75	10.00	2.46	2.30	2.62	7.73	7.20	8.30
PCMHI and SMH	11.77	10.90	12.71	2.78	2.59	2.98	10.36	9.52	11.28
SMH	4.48	4.08	4.91	2.21	2.01	2.43	3.92	3.57	4.30
Age									
≤ 44	Ref			Ref			Ref		
45–64	0.81	0.75	0.88	0.69	0.64	0.74	0.73	0.68	0.79
≥ 65	0.65	0.59	0.71	0.46	0.41	0.50	0.51	0.46	0.56
Sex									
Female	Ref			Ref			Ref		
Male	0.92	0.83	1.01	0.83	0.76	0.91	0.82	0.75	0.91
Race									
White	Ref			Ref			Ref		
African American	1.00	0.92	1.09	0.87	0.81	0.95	0.91	0.84	1.00
Other	1.06	0.90	1.24	0.99	0.86	1.15	0.99	0.84	1.17
Unknown	0.82	0.70	0.96	0.91	0.78	1.07	0.89	0.77	1.04
Hispanic	1.08	0.94	1.23	0.87	0.77	0.98	0.99	0.87	1.13
Marital status									
Married	Ref			Ref			Ref		
Not married	0.91	0.84	0.98	0.84	0.78	0.90	0.87	0.80	0.94
Never married	0.92	0.84	1.01	0.77	0.70	0.84	0.86	0.78	0.94
Unknown	0.98	0.76	1.26	1.05	0.84	1.32	1.06	0.82	1.37
Service connected	1.18	1.10	1.28	1.14	1.06	1.22	1.16	1.08	1.25
70+%									
Number of PC encounters in prior 12 months	0.97	0.96	0.98	0.96	0.95	0.97	0.97	0.96	0.98
No prior VHA outpatient use	1.24	1.15	1.33	0.93	0.87	1.00	1.15	1.07	1.24
PHQ-2 score	1.05	1.02	1.08	1.12	1.09	1.15	1.09	1.06	1.12
Mental health diagnoses in prior year									
Anxiety	1.14	0.97	1.34	1.10	0.94	1.27	1.17	1.00	1.37
PTSD	1.18	1.05	1.32	0.83	0.74	0.93	1.13	1.01	1.27
SMI	1.01	0.80	1.27	0.37	0.28	0.49	0.78	0.62	0.97
SUD	1.32	1.11	1.56	0.81	0.68	0.97	1.13	0.95	1.34
Other	1.23	1.03	1.47	0.72	0.61	0.85	1.06	0.89	1.26

OR odds ratio, CI confidence interval, PC primary care, PCMHI Primary Care-Mental Health Integration, SMH Specialty Mental Health, PHQ Patient Health Questionnaire

*Logistic regression models were weighted to account for likelihood of receiving same-day PCMHI and/or SMH services. The facility where patients received their initial positive depression screen was included as a covariate in the models, ORs not shown

A limitation of this study is that patients may have unmeasured differences in treatment needs. Although all screened positive for depression, screening is not equivalent to diagnosis and only 23% of patients received a same-day depression diagnosis. Nonetheless, in a sensitivity analysis limited to patients who received a same-day depression diagnosis, the odds of initiating either treatment remained significantly higher among patients receiving same-day PCMHI.

After more than a decade of VA PCMHI service implementation, and 7 years after the initial assessment, this study documents that same-day PCMHI services continue to have positive associations with treatment engagement among patients with positive depression screens. Findings support ongoing efforts to ensure the availability of PCMHI services, including same-day services access.

Acknowledgments: This study was conducted as part of the Veterans Health Administration (VHA) Primary Care Mental-Health Integration National Evaluation. We thank VHA program, operations, and policy leaders regarding this report.

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Compliance with Ethical Standards:

Conflict of Interest: The authors declare that they do not have a conflict of interest.

REFERENCES

1. Pomerantz AS, Cole BH, Watts BV, Weeks WB: Improving efficiency and access to mental health care: Combining integrated care and advanced access. *Gen Hosp Psychiatry* 30:546–551, 2008
2. Wray LO, Szymanski BR, Kearney LK, et al: Implementation of primary care-mental health integration services in the Veterans Health Administration: Program activity and associations with engagement in specialty mental health services. *J Clin Psychol Med Settings* 19:105–116, 2012
3. Szymanski BR, Bohnert KM, Zivin K, et al: Integrated care: treatment initiation following positive depression screens. *J Gen Intern Med* 28:346–352, 2013
4. McCaffrey DF, Griffin BA, Almirall D, et al: A tutorial on propensity score estimation for multiple treatments using generalized boosted models. *Stat Med* 32(19):3388–3414, 2013
5. Ridgeway G, McCaffrey D, Morral A, et al: Toolkit for weighting and analysis of nonequivalent groups: a tutorial for the twang package. RAND Corporation. June 16, 2016. Available at www.rand.org. Accessed Sep 21, 2018
6. Bohnert KM, Sripada RK, Mach J, et al: Same-day integrated mental health care and PTSD diagnosis and treatment among VHA primary care patients with positive PTSD screens. *Psychiatr Serv* 67(1):94–100, 2015

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