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The Impact of Race and Ethnicity on Rates of Return to Psychotherapy for Depression

John E. Zeber¹, Karen J. Coleman², Heidi Fischer², Tae Yoon², Brian K. Ahmedani³, Arne Beck⁴, Samuel Hubley⁵, Zac Imel⁶, Rebecca C. Rossom⁷, Susan M. Shortreed⁸, Christine Stewart⁸, Beth E. Waitzfelder⁹, and Greg E. Simon⁸

¹Baylor Scott & White Health, Center for Applied Health Research; Central Texas Veterans Health Care System; Temple, TX

²Kaiser Permanente Southern California, Department of Research and Evaluation, Pasadena, CA

³Henry Ford Health System, Behavioral Health Services and Center for Health Policy and Health Services Research, Detroit, MI

⁴Kaiser Permanente Colorado, Institute for Health Research, Denver, CO

⁵University of Colorado Denver, Aurora, CO

⁶University of Utah, Salt Lake City, UT

⁷HealthPartners Institute, Minneapolis, MN

⁸Group Health Research Institute, Seattle, WA

⁹Kaiser Permanente Center for Health Research – Honolulu, HI

Abstract

Background—There are many limitations with the evidence base for the role of race and ethnicity in continuation of psychotherapy for depression.

Methods—The study sample consisted of 242,765 patients 18 years old from six healthcare systems in the Mental Health Research Network (MHRN) who had a new episode of psychotherapy treatment for depression between 1/1/2010 and 12/31/2013. Data were from electronic medical records and organized in a Virtual Data Warehouse (VDW). The odds of racial and ethnic minority patients returning for a second psychotherapy visit within 45 days of the initial session were examined using multilevel regression.

Results—The sample was primarily middle aged (68% 30 – 64 years old), female (68.5%), and non-Hispanic white (50.7%), had commercial insurance (81.4%), and a low comorbidity burden (68.8% had no major comorbidities). Return rates within 45 days of the first psychotherapy visit were 47.6%. Compared to their non-Hispanic white counterparts, racial and ethnic minority patients were somewhat less likely to return to psychotherapy for a second visit (adjusted Odds Ratios [aORs] ranged from 0.80 to 0.90). Healthcare system was a much stronger predictor of

Corresponding author address: Karen J. Coleman, PhD, Kaiser Permanente Southern California, Department of Research and Evaluation, 100 S. Los Robles, Pasadena, CA; phone: 626-564-3580; fax: 626-564-3409; Karen.J.Coleman@kp.org.

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return rates (aORs ranged from 0.89 to 5.53) while providers accounted for 21.1% of the variance in return rates.

Conclusions—Provider and healthcare system variation were stronger predictors of patient return to psychotherapy than race and ethnicity. More research is needed to understand why providers and healthcare systems determine psychotherapy return rates for patients of all racial and ethnic groups.

Keywords

healthcare system variability; race and ethnicity; provider variability

Introduction

Multiple lines of evidence reveal inequities in our healthcare systems. For example, in a study of over 1 million patients who received a psychiatric diagnosis in 2011 across 11 not-for-profit healthcare systems in the United States (US), racial and ethnic minorities on average were less likely to receive a diagnosis for depression and initiate pharmacotherapy, but were more likely to initiate psychotherapy (Coleman et al., 2016). A subsequent study explored the relationship between race and ethnicity and antidepressant adherence and found that even after adjustment for patient factors such as age, education, income, insurance type, disease burden, mental healthcare use, and type of prescribing provider, patients' race and ethnicity were the strongest predictors of adherence to medication treatment for depression (Rossom et al., 2016).

Findings for racial and ethnic minority patients' adherence (commonly referred to as "retention") to psychotherapy treatment for depression are mixed. There have now been three meta-analyses of studies on factors associated with psychotherapy retention for a number of mental health conditions. (Cooper and Conklin, 2015; Swift and Greenberg, 2012; Wierzbicki and Pekarik, 1993) The oldest meta-analysis (Wierzbicki and Pekarik, 1993) observed variation in effects for race and ethnicity depending upon how they analyzed the data. Simple paired comparisons showed that non-white race was associated with lower retention, however, after adjustment for other factors such as socioeconomic status (SES), these differences were no longer significant. Swift and Greenberg (2012) used more sophisticated meta-analytic multilevel models and found no effect of race and ethnicity on psychotherapy retention after accounting for other patient demographics, as well as provider-, treatment- and system-level variables. Finally, Cooper and Conklin (2015) only included randomized controlled trials in their meta-analysis and found that after accounting for other patient demographics, as well as provider-, treatment- and system-level variables, those studies with higher proportions of non-white patients had lower psychotherapy retention rates.

There were many limitations with these meta-analyses. One was that even though they covered several hundred published studies, only about 40% included information for patient race and ethnicity (individual sample size for these studies was not reported). Another was that various definitions for retention were used across individual studies included in the reviews and this contributed significantly to findings for at least one of the meta-analyses

(Swift and Greenberg, 2012). Finally, several mental health conditions were included in these meta-analyses so the findings for depression treatment alone were not clear. Our study is designed to address these limitations by 1) including a large, diverse ethnic sample, 2) focusing on depression treatment, and 3) having a uniform definition of psychotherapy retention to address the question of how much a patient's racial and ethnic background contributes to the likelihood that they will return for a second psychotherapy visit within 45 days after their initial visit.

Methods

Data Sources

Data were obtained from six healthcare systems in the Mental Health Research Network (MHRN), a consortium of public-domain research centers affiliated with 13 large not-for-profit healthcare systems that each provide comprehensive care (HCSRN, 2017). All MHRN healthcare systems organize electronic medical record data, insurance claims and other administrative data into a Virtual Data Warehouse (VDW) to facilitate population-based research (Ross et al., 2014). Access to the dataset used for this study and its documentation are available by request from the MHRN data website (MHRN, 2017).

Group Health Cooperative, HealthPartners, Henry Ford Health System, Kaiser Permanente Colorado, Kaiser Permanente Hawaii, and Kaiser Permanente Southern California contributed data to this study. Combined, these systems provide care to 6.8 million members and/or patients. Based on previous research (Coleman et al., 2016), the rates of diagnosed depression in these systems overall was 9.6% ($n = 652,800$ patients affected by depression).

Patients are enrolled through employer-sponsored insurance plans, individual insurance plans, and capitated Medicaid and Medicare programs, and are generally representative of each system's regional population. Group Health, HealthPartners and Henry Ford are mixed-model healthcare systems that provide care through both internal and external providers, so at these sites analytic samples were limited to patients who were also health plan members. Each healthcare system's Institutional Review Board approved all study procedures.

Study Population

The study sample consisted of patients 18 and older who had a "new" episode of psychotherapy treatment between 1/1/2010 and 12/31/2013 and who were continuously enrolled in the healthcare systems for at least 270 days prior to the psychotherapy episode. This enrollment criteria was chosen so that we could determine if patients were receiving ongoing pharmacotherapy for depression. A "new" episode had a washout period (i.e., no psychotherapy visits) for at least 270 days prior to the index psychotherapy visit and was not necessarily a patient's first time in psychotherapy.

We defined psychotherapy treatment using standardized procedural terminology codes for diagnostic interviews/assessments and individual psychotherapy (HMSA Provider Resource Center, 2017). We did not consider appointments that were less than 30 minutes because in the health systems included in this study these appointments were primarily associated with medication management and/or initial assessment for referral to treatment. The procedural

codes had to be accompanied by a depression diagnosis (ICD9 diagnoses 296.2, 296.3, 300.4 or 311) in the period starting 90 days before the index psychotherapy visit that was the start of the new episode (designated by the procedural codes) and ending 15 days after. Patients were excluded if they had a diagnosis of schizophrenia or bipolar disorder in this same period (90 days before to 15 days after).

Measures

Patient demographics—Each healthcare system implemented meaningful use requirements (Blumenthal and Tavenner, 2010) to collect self-reported gender and race and ethnicity data, which were recorded in the health system's electronic medical record and incorporated into the VDW. We followed national guidelines to create mutually exclusive race and ethnicity categories (Institute of Medicine, 2009; Taylor et al., 2012). Patients self-reporting Hispanic ethnicity were considered Hispanic regardless of the race category they endorsed, following recommendations from a US survey that found that Hispanics consider themselves a race of people and not an ethnicity (Taylor et al., 2012). If a patient's records contained two or more race categories (rather than a single category of "mixed race"), they were assigned the least prevalent race category in the US population to maximize the ability to understand differences in diagnoses and treatment for the least represented racial groups. Patients for whom race and ethnicity data were missing were classified in the unknown group. Education and income are not commonly collected at the individual level in the healthcare systems included in this study and thus education and income were estimated for each patient based upon blocks in the 2010 U.S. census.

Comorbidity burden—Disease burden was assessed by calculating a modified Charlson Comorbidity Index for each patient. Diagnosis codes assessed in the year before the index psychotherapy visit were used to provide a summary score assessing a patient's risk for 10-year mortality based upon 22 different health conditions (Charlson et al., 1987).

Mental health treatment status—Data for up to five years prior to the date of the index psychotherapy visit for each patient in our sample were used to identify mental health visits (defined as visits to specialty mental health providers or visits to general medical providers with a recorded mental health diagnosis) and dispensed prescriptions for antidepressant medications. These indicators were used to define two categories of mental health treatment status relative to the index psychotherapy visit: 1) simultaneous treatment with an antidepressant defined as a) having at least two fills within 270 days *prior* to and/or at least two fills within 180 days *after* the date of the index psychotherapy visit or b) starting an antidepressant within 30 days from the date of the index psychotherapy visit, and 2) prior treatment was defined as having a mental health visit, hospitalization with a mental health diagnosis, and/or antidepressant prescription within the last 5 years prior to the index psychotherapy visit but not within the prior 180 days. Antidepressants and mental health visits were tested separately in the logistic regression models for each of these mental health treatment status categories.

Analysis

Outcome definition—Swift and Greenberg (2012) provided a summary of the various definitions in the literature used to define psychotherapy retention/discontinuation/drop out. These included 1) failure to complete a prescribed course of treatment, 2) not having a certain number of visits, 3) missing appointments and not rescheduling them, 4) therapist judgment that treatment was terminated after a patient discontinued, and 5) patient discontinuing treatment before a clinically significant change was seen. Because we were using existing electronic medical record billing codes to define a psychotherapy visit, we could only use the third definition. We used failure to attend a second psychotherapy visit within 45 days of the index psychotherapy visit as our outcome, which is a measure of psychotherapy return rather than drop out or discontinuation since patients had only attended an initial visit. We used probability of returning for a second visit rather than reaching some minimum number of visits because the greatest psychotherapy attrition occurs following the first visit (Simon et al., 2012). Forty-five days was chosen based upon our previous work (Simon et al., 2012) and clinical practice recommendations for effective treatment for depression (Agency for Healthcare Research and Quality, 2012).

Statistical models—We fit a multilevel logistic regression model with a random intercept for each provider to predict psychotherapy return while adjusting for provider characteristics (Raudenbush and Bryk, 2002). An intraclass correlation was used to describe how much return rates varied from provider to provider while at the same time controlling for differences in patient characteristics (Wu et al., 2010). The model included patient level covariates as fixed effects. We accounted for healthcare system variation by including each site as a fixed effect in the adjusted model. Adjusted odds ratios (aORs) as well as 95 percent confidence intervals (CIs) were reported for each covariate controlling for all other variables in the model. We included the following patient covariates: age, gender, insurance type, comorbidity burden, prior mental health treatment, ongoing pharmacotherapy for depression, concurrent pharmacotherapy for depression, neighborhood education, and income. All analyses were performed using R version 3.2.3.

Sensitivity analyses—We conducted three main sensitivity analyses: 1) using a 90-day definition for psychotherapy return instead of 45 days, 2) removing providers who appeared to only perform assessments and/or diagnostic visits and thus their patients would not be expected to return, and 3) removing patients who lost their membership before they had a chance to return for another psychotherapy visit (i.e., before 45 days of time passed after the initial “new” psychotherapy episode). We defined providers who primarily conducted assessment interviews as those who had <10% of their patients with return visits at the point of the 45 day psychotherapy visit. This cutoff was selected through a visual inspection of the distribution of raw return rates by providers.

Results

Patient Characteristics

Descriptive statistics are provided in Table 1. Overall there were 242,765 patients with a new episode of psychotherapy treatment between 2010 and 2013. The sample was primarily

middle aged (68% 30 – 64 years old), female (68.5%), non-Hispanic white (50.7%), had commercial insurance (81.4%), and were mostly healthy (68.8% no comorbidity burden). Patients lived in neighborhoods that had annual incomes of \$40,000 or more (57.3%) and where less than 25% of the residents had a college degree (60.9%). In general, 52.9% of patients had some prior antidepressant use (52.9%), 44.8% had prior mental health related healthcare visits, and only 3% had a prior mental health-related hospitalization. Most patients were not taking an antidepressant concurrently (80.4%) or continuing (78.9%) antidepressant treatment at the time of their “new” psychotherapy visit.

Psychotherapy Return Rates

Overall, the return visit rate was 47.6%. Characteristics of patients who did and did not return are shown in Table 1. Adjusted results from the logistic model are shown in Table 2. Provider-level differences accounted for 21% of the overall variation in the odds of returning for a second psychotherapy visit. All racial and ethnic minority patients had significantly lower odds of returning compared to the reference group of Non-Hispanic whites, with aORs ranging from 0.80 (95% CI: 0.74 – 0.87) for Native Hawaiians/Pacific Islanders to 0.88 (95% CI: 0.79,0.97) for Native Americans/Alaskan Natives. Healthcare system had a large effect on return rates. Compared to the largest healthcare system in the sample, aORs varied from 0.88 (95% CI: 0.79,0.99) to 5.47 (95% CI: 4.95,5.99).

Other patient-level factors were also related to psychotherapy return rates. Middle-aged (30–44 years old) patients were more likely than the youngest patients (18–29 years old; aOR: 0.88; 95% CI: 0.86,0.90) or the oldest patients (≥ 65 years old; aOR: 0.84; 95% CI: 0.79,0.88) to return within 45 days for a psychotherapy visit. Men had lower odds of a return psychotherapy visit within 45 days than women (aOR: 0.93; 95% CI: 0.91,0.95). Lower neighborhood income and education and greater comorbidity burden had small but significant associations with lower return rates. Prior antidepressant use was associated with reduced likelihood of return (aOR = 0.84; 95% CI: 0.82, 0.85), as was having a prior mental health-related hospitalization (aOR = 0.90; 95% CI: 0.86, 0.95). There was no association with having a prior mental health-related visit. Those with simultaneous treatment with an antidepressant had higher odds of returning for a second psychotherapy visit (aOR: 1.20; 95% CI: 1.17,1.22).

Sensitivity Analyses

Sensitivity analyses results are shown in the supplementary materials. None of the sensitivity analyses substantially changed the main results.

Discussion

We found that racial and ethnic minority patients were less likely to return for a second psychotherapy visit in the 45 days after their initial visit while controlling for the impact of other patient factors, healthcare system, and provider-level variability. However, differences by race and ethnicity were relatively small (aORs ranged from 0.80 to 0.90) compared to the large contribution healthcare systems and providers made to the likelihood that a patient would have a second psychotherapy visit. This is in contrast to our previous findings on

depression medication adherence in the same population of patients using the same methods for data abstraction and analysis, where there were large differences between racial and ethnic minorities and non-Hispanic white patients and the impact of healthcare system and provider were minimal (Rossom et al., 2016). Thus while potential differences for racial and ethnic groups of patients in return rates for psychotherapy remain an issue to monitor in mental health treatment, they were not substantial determinants of return rates in our study.

Our findings are supported by the limited literature in this area that providers and organizational culture contribute to dropout in psychotherapy. Potential factors, although some are controversial, include lack of racial, ethnic, and language concordance between providers and patients (Sripada et al., 2016; Collado et al., 2016), poor therapeutic alliance (Johansson & Eklund, 2006; Cooper et al., 2016), and lack of cultural competence (Imel et al., 2011). Implicit racial bias of healthcare providers, although not studied specifically in psychotherapy dropout and effectiveness, has been implicated in a number of studies on treatment outcomes in racial and ethnic minority patients (Green et al., 2007; Spont et al., 2015). There has also been some discussion about the fact that dropout is not necessarily an indicator of poor treatment (Simon et al., 2012). Patients may improve with fewer psychotherapy visits than recommended and discontinue psychotherapy, which would be considered a “good” outcome (Baldwin & Atkins, 2009; Imel et al., 2015). We were not able to examine outcomes in these patients; however, this would be an important addition to any future studies. These issues might be mitigated through system and provider sensitivity to the fact that patients may perceive such dynamics as possible barriers to returning for follow-up visits.

Organizational culture and standardization of evidence-based psychotherapy treatments for depression are areas that have not been studied systematically. We saw large differences in psychotherapy return rates within 45 days of the initial visit across healthcare systems, ranging from 39.8% to 69.8%. Although these sites also varied in their distribution of racial and ethnic minorities, we controlled for this in our analyses, suggesting that other organizational factors might have contributed to these differences. Some work in this area suggests that organizational and/or staff instability was an important predictor of dropout from psychotherapy treatment (Brandt et al., 2016; Werbart et al., 2014) however, there was no way for us to index the level of instability in the various healthcare systems studied. There is clearly a need for more research in this area.

Although the healthcare systems within the MHRN value patient engagement and outreach, both to understand what individuals seek and expect from their mental health treatment, and to focus attention on quality improvement (Rossom et al., 2016), it is unclear to what degree the systems included in this study implemented these practices. Unfortunately, a recent survey found that less than 25% of therapists regularly practice such engagement and retention activities, suggesting that greater emphasis on such interventions might be warranted (Westmacott and Hunsley, 2016). Practicing this patient-centered approach could be particularly difficult in very large institutions. In our study, the population receiving psychotherapy varied from over 200,000 to less than 3,000. Thus, it could be expected that implementing psychotherapy retention strategies such as regular appointment reminders and

patient-centered case management plans would be very different for 200,000 vs 3,000 patients.

There are important limitations with our study. We were not able to determine why provider and healthcare system were strong predictors of return to psychotherapy within 45 days of the initial visit. This would necessitate collection of data that were not available in electronic medical records such as patient-reported outcomes, patient-provider therapeutic alliance, provider training, fidelity to treatment, type of treatment used, engagement and retention efforts, cultural-linguistic competence, and organizational standards and guidelines regarding types of psychotherapeutic treatments used for depression. In addition, information about provider demographics, amount of clinical training, and type of clinical license was not widely available.

Another potential limitation of our study was that the window for return to treatment may have been too narrow given the challenges that many healthcare systems have with psychotherapy access and thus not representative of the population who attempted to make a return visit. However, when we extended the period of return to 90 days after the initial visit, our findings did not change (see supplemental material). Finally, also related to generalizability, our study had very few low-income patients whose challenges with adherence to any form of treatment are well documented independent of physician and healthcare system determinants. Our findings might have been different with indigent patients or those primarily receiving subsidized insurance.

Our overall rates of return to psychotherapy (47.6%) were lower than retention rates reported in the literature, although we were within the range reported for individual studies (25.8% to 100%). The two most recent meta-analyses found overall retention rates of 80.3% (Swift and Greenberg, 2012) and 82.5% (Cooper and Conklin, 2015). The older meta-analysis in this area reported a similar overall retention rate (53.4%) to ours (Wierzbicki and Pekarik, 1993). One possible explanation for the differences between our return rates and those reported in the literature could be that our healthcare systems were different than those included in these meta-analyses. Recent studies have shown that the type of practice determines psychotherapy return rates independent of demographics and insurance coverage (Simon et al., 2012). In addition, our sample had a higher proportion of racial and ethnic minority patients than that reported in the literature. Cooper and Conklin (2015) found that randomized trials of psychotherapy treatment with larger proportions of non-Hispanic white patients were likely to report higher rates of drop out.

Finally, we defined psychotherapy as those visits that used standardized procedural terminology codes for diagnostic interviews/assessments and individual psychotherapy (HMSA Provider Resource Center, 2017) and were at least 30 minutes long. It is possible that we may have missed psychotherapy visits of shorter duration and thus underestimated the rates of psychotherapy return. However, in our healthcare systems these shorter visits are almost always used for medication management even if psychotherapy also occurs and we wanted to be as certain as possible that we were studying psychotherapy treatment alone.

Despite these limitations, our study is one of the largest in the literature ($n = 242,765$ patients) examining the impact of race and ethnicity on psychotherapy return rates specifically for patients starting a new episode of depression treatment in real world healthcare systems while controlling for patient demographics and variation due to providers and healthcare systems. Although we did find lower retention rates for racial and ethnic minority patients, provider- and system-level variation were stronger predictors. Much more research is needed to understand why these were strong predictors.

Conclusions

In our previous work we found that racial and ethnic minority patients were more likely to receive psychotherapy for their depression than pharmacotherapy. Given that psychotherapy may be the main treatment provided for/chosen by racial and ethnic minority patients, the implications from the current study findings suggest that efforts should be made to understand the provider and healthcare system level barriers to psychotherapy return and thus effective treatment for these patients. Key factors for study and possible improvement include therapeutic alliance, tailoring of psychotherapy approaches to these patients, cultural competence, implicit racial bias among providers, organizational culture, and the implementation of retention strategies such as appointment reminders and case management strategies.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Descriptive statistics [n (%)] for those who returned (second column) and did not return (first column) to a second psychotherapy visit within 45 days of the initial visit for each variable in the study. Overall return rates were 47.6%. Column percentages are presented for each variable by no return and return

	No Return (n = 127,164)	Return (n = 115,601)
Age (years)		
18 – 29	27,005 (21.2%)	24,089 (20.8%)
30 – 44	37,915 (29.8%)	37,603 (32.5%)
45 – 64	46,631 (36.7%)	43,338 (37.5%)
65	15,613 (12.3%)	10,571 (9.1%)
Gender		
Female	86,629 (68.1%)	79,734 (69%)
Male	40,535 (31.9%)	35,867 (31%)
Race/Ethnicity		
Non-Hispanic white	61,453 (48.3%)	61,709 (53.4%)
Hispanic	33,192 (26.1%)	21,780 (18.8%)
Non-Hispanic black	11,475 (9%)	8,087 (7%)
Asian	6,342 (5%)	5,253 (4.5%)
Native Hawaiian/Pacific Islander	1,724 (1.4%)	1,277 (1.1%)
Native American/Alaskan Native	908 (0.7%)	884 (0.8%)
Other/Mixed Race/Unknown	12,070 (9.5%)	16,611 (14.4%)
Annual Neighborhood Income		
\$40,000	67,936 (53.4%)	71,222 (61.6%)
< \$40,000	59,228 (46.6%)	44,379 (38.4%)
Neighborhood Education		
25% College Graduates	43,874 (34.5%)	51,019 (44.1%)
< 25% College Graduates	83,290 (65.5%)	64,582 (55.9%)
Insurance Type		
Commercial	10,1762 (80%)	95,922 (83%)
Medicare/Medicaid	19,738 (15.5%)	14,240 (12.3%)
Private/Other/Missing	5,664 (4.5%)	5,439 (4.7%)
Comorbidity Burden		
None	85,543 (67.3%)	81,373 (70.4%)
One or more	35,338 (27.8%)	28,272 (24.5%)
Missing	6,283 (4.9%)	5,956 (5.2%)
Prior Antidepressant Use		
No	57,335 (45.1%)	57,019 (49.3%)
Yes	69,829 (54.9%)	58,582 (50.7%)
Prior Psychotherapy Use		

	No Return (n = 127,164)	Return (n = 115,601)
No	68,854 (54.1%)	65,115 (56.3%)
Yes	58,310 (45.9%)	50,486 (43.7%)
Prior Mental Health Hospitalization		
No	122,971 (96.7%)	112,501 (97.3%)
Yes	4,193 (3.3%)	3,100 (2.7%)
Simultaneous Antidepressant Treatment *		
No	202,104 (79.5%)	184,589 (79.8%)
Yes	52,224 (20.5%)	46,613 (20.2%)
Healthcare Site		
1	8,937 (7%)	20,700 (17.9%)
2	16,601 (13.1%)	24,859 (21.5%)
3 (smallest site)	859 (0.7%)	867 (0.7%)
4	10,601 (8.3%)	9,068 (7.8%)
5	3,699 (2.9%)	3,041 (2.6%)
6 (largest site)	86,467 (68%)	57,066 (49.4%)

* Simultaneous antidepressant treatment was defined as at least two fills within 270 days *prior* to and/or at least two fills within 180 days *after* the date of the “new” psychotherapy episode start or starting pharmacotherapy within 30 days of the date of the “new” psychotherapy episode start

Table 2

Adjusted odds (aOR) and 95% confidence intervals (CI) for the odds of returning for a second psychotherapy visit within 45 days of the initial visit. Provider level variation was accounted for by fitting a multilevel logistic regression model with a random intercept for each provider. Providers accounted for 21.1% of the variance in their clients' return visit rates.

	aOR (95% CI)
Age (years)	
30 – 44	1 (referent)
18 – 29	0.88 (0.86,0.90)
45 – 64	0.97 (0.94,0.99)
65	0.84 (0.79,0.88)
Gender	
Female	1 (referent)
Male	0.93 (0.91,0.95)
Race/Ethnicity	
Non-Hispanic white	1 (referent)
Hispanic	0.86 (0.84,0.89)
Non-Hispanic black	0.81 (0.78,0.84)
Asian	0.85 (0.82,0.89)
Native Hawaiian/Pacific Islander	0.80 (0.74,0.87)
Native American/Alaskan Native	0.88 (0.79,0.97)
Other/Mixed Race/Unknown	0.90 (0.88,0.94)
Annual Neighborhood Income	
\$40,000	1 (referent)
< \$40,000	0.95 (0.93,0.97)
Neighborhood Education	
25% College Graduate	1 (referent)
< 25% College Graduate	0.93 (0.91,0.96)
Insurance Type	
Commercial	1 (referent)
Medicare/Medicaid	0.89 (0.85,0.92)
Private/Other/Missing	0.88 (0.84,0.91)
Comorbidity Burden	
None	1 (referent)
One or More	0.96 (0.94,0.98)
Missing	0.96 (0.92,1.00)
Prior Antidepressant Use	
No	1 (referent)
Yes	0.84 (0.82,0.85)
Prior Psychotherapy Use	

	aOR (95% CI)
No	1 (referent)
Yes	1.01 (0.99,1.03)
Prior Mental Health Hospitalization	
No	1 (referent)
Yes	0.90 (0.86,0.95)
Simultaneous Antidepressant Treatment *	
No	1 (referent)
Yes	1.20 (1.17,1.22)
Healthcare Site	
6 (largest site)	1 (referent)
1	5.47 (4.95,5.99)
2	2.05 (1.90,2.23)
3 (smallest site)	1.27 (1.00,1.62)
4	0.88 (0.79,0.99)
5	1.14 (0.88,1.46)

* Simultaneous antidepressant treatment was defined as at least two fills within 270 days *prior* to and/or at least two fills within 180 days *after* the date of the “new” psychotherapy episode start or antidepressant treatment was defined as starting pharmacotherapy within 30 days of the date of the “new” psychotherapy episode start.