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Research Article

ARE THERE RACIAL/ETHNIC DISPARITIES IN VA PTSD TREATMENT RETENTION?

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Background: ***Chronic posttraumatic stress disorder (PTSD) can result in significant social and physical impairments. Despite the Department of Veterans Affairs' (VA) expansion of mental health services into primary care clinics to reach larger numbers of Veterans with PTSD, many do not receive sufficient treatment to clinically benefit. This study explored whether the odds of premature mental health treatment termination varies by patient race/ethnicity and, if so, whether such variation is associated with differential access to services or beliefs about mental health treatments.*** **Methods:** ***Prospective national cohort study of VA patients who were recently diagnosed with PTSD (n = 6,788). Self-administered surveys and electronic VA databases were utilized to examine mental health treatment retention across racial/ethnic groups in the 6 months following the PTSD diagnosis controlling for treatment need, access factors, age, gender, treatment beliefs, and facility factors.*** **Results:** ***African American and Latino Veterans were less likely to receive a minimal trial of pharmacotherapy and African American Veterans were less likely to receive a minimal trial of any treatment in the 6 months after being diagnosed with PTSD. Controlling for beliefs about mental health treatments diminished the lower odds of pharmacotherapy retention among Latino but not African American Veterans. Access factors did not contribute to treatment retention disparities.*** **Conclusions:** ***Even in safety-net healthcare systems like VA, racial and ethnic disparities in mental health treatment occur. To improve treatment equity, clinicians may need to more directly address patients' treatment beliefs. More understanding is needed to address the treatment disparity for African American Veterans. Depression and Anxiety 32:415–425, 2015.***

Key words: ***PTSD/posttraumatic stress disorder; adherence; ethnicity/race; health services; treatment***

Posttraumatic stress disorder (PTSD) is common among Veterans, with approximately 400,000 Veterans who use the Department of Veterans Affairs (VA) health care carrying a PTSD diagnosis.[1] Although PTSD will often improve whether or not it is treated, for many

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PTSD will become chronic if left untreated.[2–4] Because chronic PTSD has numerous adverse consequences, including higher rates of cardiovascular and autoimmune diseases, hypertension, dementia, hospitalization, unemployment, poverty, and suicide,[5–13] ensuring adequate mental health care for those with PTSD may have long-term health benefits.

There are efficacious treatments for PTSD,[14,15] and recommended first-line interventions in VA/Department of Defense (DoD) PTSD Clinical Practice Guidelines[15] include both psychotherapies and pharmacotherapies. Emerging evidence suggests that with appropriate treatment, rates of PTSD remission may be as high as 65%, and that medical sequelae may concomitantly abate.[16–19] Unfortunately, many Veterans with PTSD who need mental health care do not receive sufficient treatment to clinically benefit.[20–22]

Lower rates of mental health treatment retention have been observed among racial and ethnic minorities, and evidence suggests this is largely due to disparities in treatment.[23–30] Among racial/ethnic minority Veterans with PTSD, lower treatment retention rates have been similarly observed[28,31]; however, whether such variation reflects healthcare disparities depends on whether the factor(s) underlying the variation are "admissible" or not.[32] According to the Institute of Medicine (IOM), a healthcare disparity is defined as differential services received by demographically defined groups that are *not* due to "admissible" differences such as variation in clinical treatment need (e.g. osteoporosis treatment among women) or variation in beliefs about and preferences for treatment.[33] Previous studies examining racial/ethnic variation in mental health treatment retention rates among Veterans with PTSD suggest that while disparities in outpatient treatment may exist, available evidence is too weak to be conclusive. Limitations in existing studies include reliance on administrative databases, focus on specialty programs, and lack of information regarding treatment need or patient beliefs about treatments.[28,30,31]

Our first question was whether racial/ethnic variation in outpatient mental health treatment retention rates would be observed among Veterans with PTSD if need for treatment were taken into consideration. Given evidence of disparities in other populations, we hypothesized that Veterans of minority race/ethnicity who have PTSD and are seeking VA mental health services would experience disparities as observed elsewhere,[23,25,26,34–36] resulting in reduced treatment retention rates.

Because in non-VA studies differential access contributes to racial/ethnic disparities in treatment,[34,35] we wondered whether inclusion of access factors would affect demographic variation in treatment retention. VA functions as a safety net for many indigent Veterans and this need-based eligibility could diminish racial/ethnic disparities related to treatment access found elsewhere. However, lack of financial resources can impact access to treatment in other ways, such as through the unavailability of reliable transportation. Accordingly, we hypothesized that differential access would contribute to any observed disparities.

Finally, we wondered whether treatment retention would be predicted by differences in beliefs about treatments. Treatment beliefs contribute to mental health treatment preferences,[37] and have been shown to vary across racial and ethnic groups.[38–40] Although beliefs about mental health treatments can impact treatment engagement, they may change as a function of treatment experience and so must be determined prospectively.[41–45] Therefore, our third hypothesis was that patient treatment beliefs at the time of treatment initiation would contribute to any variation in treatment retention across racial/ethnic groups.

To address these questions, we conducted a prospective national survey study of a cohort of Veterans recently diagnosed with PTSD and followed their treatment utilization for a 6-month period postdiagnosis.

METHODS

SUBJECTS

As described elsewhere,[45] the sample consisted of Veterans diagnosed with PTSD (ICD9 code 309.81) during an outpatient visit at any VA facility from June 2008 to July 2009. Veterans who received antidepressants, antipsychotics, or who had any mental health diagnoses (except chemical dependency[46]) or mental health appointments in the prior year were excluded. Therefore, we sampled Veterans who were at the beginning of a possible episode of mental health care. Veterans had many psychiatric comorbidities; however, we excluded those with moderate to severe cognitive disorders, schizophrenia, schizoaffective, or schizophreniform disorders. Veterans with no available mailing address were also excluded.

To maximize representativeness of women and smaller minority groups we sampled all women, all Latino men, and men of any non-African American minority race. White, African American, and men of unknown race were randomly sampled according to the sampling fractions of 0.1, 0.19, and 0.51, respectively. Sampling fractions were based on presumed base rates of group membership and estimates of group differences from prior work.[31]

Demographic, diagnostic, and VA healthcare utilization data were abstracted from the National Patient Care Database (NPCD) and outpatient prescriptions from the Decision Support System (DSS) National Pharmacy Extract database. Data on outpatient encounters are uploaded daily to the NPCD from each VA facility. The NPCD creates SAS files of the encounter data, which are updated every 2 weeks. We identified and sampled new cases every 2 weeks. The study was approved by the Minneapolis VA Institutional Review Board.

FOLLOW-UP

Pharmacologic Treatment. Prescription drug classes and release dates during the 6 months following the diagnostic index appointment were determined. Only guideline-recommended medications were included [i.e. selective serotonin reuptake inhibitors (SSRI) and serotonin–norepinephrine reuptake inhibitors (SNRI)].[15] Because VA may dispense 90-day supplies of antidepressants, we used 120 days of antidepressants to reflect a minimal trial of pharmacotherapy as that ensured patients refilled their prescriptions at least once.

Appointments. Using administrative indicators (stop codes), appointments during the 6 months after a PTSD diagnosis were classified

by clinic type: PTSD specialty clinics, general mental health clinics, or primary care clinics. Psychotherapy sessions were identified by current procedural terminology (CPT) codes and included only if given by a mental health provider. All psychotherapy sessions (individual and group) were included regardless of appointment length. Although we did not have access to clinical records and did not know the content of psychotherapy sessions, PTSD guideline-recommended psychotherapies are typically provided in 10 weekly sessions.[15] To allow for flexible scheduling within the sampling frame, we considered eight therapy sessions as a minimum trial of treatment.[31,47]

Surveys. We surveyed potential subjects using a modified Dillman approach.[48] First, an explanatory introductory letter was mailed to eligible patients immediately after the PTSD diagnosis. This was followed 2 days later by a cover letter with informed consent information, survey, and $10 cash payment. Ten days later, nonrespondents were sent a second cover letter and survey. Nonrespondents to the second survey were sent a third cover letter and survey via Federal Express. Initial surveys were sent between June 2008 and July 2009.

Of the 13,974 Veterans with PTSD who met inclusion criteria and selected by our sampling frame, $n = 1{,}022$ were eliminated for the following reasons: no longer eligible ($n = 16$), deceased ($n = 11$), no valid address ($n = 995$). Surveys were sent to the remaining 12,952 Veterans, and 8,492 were returned (response rate: 66%). Because updates of appointment and pharmacy data in VA administrative databases occur quarterly, some who were surveyed were not actually eligible due to pre-PTSD diagnosis mental health care, leaving 7,645 eligible surveys. To evaluate potential racial/ethnic disparities, self-reported racial/ethnic group identifications with frequencies less than 70 were not included in these analyses. Additionally, to focus on clinics in which PTSD treatment could have been provided, we omitted Veterans whose diagnoses occurred in clinics other than mental health or primary care, resulting in 6,778 patients included in the analyses.

Study Outcomes. There were three dichotomous outcome measures reflecting a minimal trial of PTSD treatment: (1) at least eight therapy sessions, (2) at least four 30-day supplies of antidepressants, (3) either eight therapy sessions or four 30-day antidepressant supplies.

EXPLANATORY VARIABLES

Demographic Variables. Gender and age were abstracted from the NPCD. Race/ethnicity was assessed by survey allowing for multiple endorsements: White, African American, Native American/Alaskan, Asian, Hispanic/Latino, and Pacific Islander/Native Hawaiian. Few endorsed multiple races/ethnicities with two exceptions. Many who endorsed Latino or Native American also endorsed White. We treated these as separate subgroups (Latino/White and Native American/White) since subtle differences in cultural identity can affect health beliefs and behavior.[49]

Treatment Need Variables. PTSD symptom severity was assessed by the PTSD Check List-Military version (PCL-M; $\alpha = .94$).[50,51] Mental health quality of life (MHQOL), an indicator of functioning in this population, was assessed by the Veterans SF-12.[52] Perceived need for mental health care was assessed by patients' agreement/disagreement with the item, "At this time I feel I need help to deal with emotional problems, PTSD and/or stress in my life."

Access Variables. VA primary care patient status, VA disability status (i.e. service connection), and the clinic type where PTSD was diagnosed (PTSD, general mental health, primary care) were abstracted from the NPCD. The Planning Systems Support Group (PSSG) zip code database was used to determine drive time from a patient's residence to the nearest VA facility. Household income (less than $10,000, $10–20,000, $20–40,000, $40–50,000, over $50,000), Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) military service, and anticipated access barriers were assessed by survey. Anticipated access barriers were determined by checklist allowing for multiple endorsements: appointment times, cost, travel distance, reliability of transportation, dependents to care for, and lack of knowledge about how to obtain treatment and scored by frequency (none, one, two, or more). OEF/OIF status was considered an access facilitator as VA has performance measures related to improving access for this population.

BELIEF VARIABLES

Beliefs about Psychotherapy. Psychotherapy beliefs were assessed using items from the Beliefs about Psychotherapy Scale,[53] which assesses attitudes about psychotherapy to address emotional problems ($\alpha = .67$). It has good psychometric properties, concurrent validity, and is sensitive to cultural differences.[53] Beliefs about antidepressants were assessed by a portion of the Patient Attitudes Toward and Ratings of Care for Depression (PARC-D)[38,54] that assesses general attitudes about the use of antidepressants, and adapted to use for PTSD. PARC-D has good psychometric properties and is sensitive to cultural differences ($\alpha = .77$).[38,54]

Beliefs about Medication. Beliefs about medication use was assessed using an 11-item abridged version of the Beliefs about Medicines Questionnaire (BMQ).[55] We used the general benefits of medication and harmfulness/overuse of medications (α's = .64 and .80, respectively) subscales. The BMQ has demonstrated validity,[55,56] and has been associated with adherence to antidepressants.[57]

Data Analyses. To estimate population-based associations with treatment, we constructed simple bivariate association measures, with corresponding 95% confidence intervals (CIs), for each of the outcome measures using those demographic, health utilization, and VA administrative variables available for all individuals in the population who met eligibility criteria for the study. We constructed simple estimates of the associations of survey items with the outcome measures among survey respondents.

We used Markov chain Monte Carlo multiple imputation to impute values of missing dichotomous, ordinal, and interval survey items. Ten different imputed values were constructed for each missing survey item, thereby creating 10 imputed datasets with complete data for these measures. Then, separately for each of these datasets, we constructed multinomial logistic regression models for the remaining categorical variables, using all other survey items as predictors, and used these models to impute values for the missing items. We then completed two parallel sets of analyses wherein we applied the following methods to each of the 10 imputed datasets and aggregating the 10 sets of results using standard methods for multiple imputations.

In the first set of analyses, we used data only from Veterans who initiated treatment and examined associations between predictors and retention outcomes in unweighted analyses. We constructed hierarchical regression models for each of the treatment outcomes using Veterans Integrated Service Network (VISN) and healthcare system within VISN as random effects. The additional variables, blocked into demographic/treatment need variables, access variables, and belief variables were then added sequentially to assess the presence of potential racial/ethnic treatment retention disparities and to determine whether the addition of these access and belief measures substantially changed the estimated odds of treatment retention rates across racial/ethnic groups.

The sample size available for the first set of analyses limited our ability to use propensity models to adjust for potential nonresponse bias (i.e. the models became unstable due to small numbers and/or empty cells in some strata). Therefore, in a second set of analyses, we used the entire sample of Veterans surveyed, irrespective of treatment initiation, and adjusted for nonresponse bias using propensity models. The analysis again used hierarchical regression models for each of the treatment outcomes incorporating random effects for VISN and healthcare system within VISN with the additional blocks of variables added sequentially to assess the presence of potential racial/ethnic treatment

retention disparities and to determine whether the addition of access and belief measures substantially changed the estimated odds of retention rates across groups. These analyses were weighted for survey inclusion and adjusted for nonresponse. To derive adjusted weights, we developed a logistic regression model for survey response using the administrative data as covariates, stratified the population by the estimated propensities, and adjusted the original sample inclusion probabilities by the response rates within these strata.

Results presented in the tables and text of this paper are from the second, adjusted, set of analyses, and the comparability of findings of the two modeling approaches is addressed below. Given the exploratory nature of the study, we report CIs for variable estimates, but did not adjust *P*-values for multiple comparisons.[58,59]

RESULTS

Of the 6,788 Veterans included in the analyses, in the 180-day post-PTSD diagnosis sampling period, $n = 1,246$ (18%) received at least 4 months of SSRI/SNRIs, $n = 567$ (8%) had at least eight psychotherapy sessions, and $n = 1,626$ (24%) were retained in at least one of these treatments. These rates are comparable to those in the population of 104,946 Veterans in the sampling period who met study eligibility criteria. In the larger population, $N = 20,813$ (20%) had 4 months of antidepressants, $N = 7,631$ (7%) had eight therapy sessions, and $N = 25,445$ (24%) were retained in at least one of the treatments. Sample demographics and scale descriptives are presented in Table 1. In Table 2 are bivariate unadjusted associations between Veteran race/ethnicity and predictors and outcome measures.

Results of the propensity adjusted models of treatment retention outcomes are in Tables 3–5. Compared to Whites, African American Veterans had reduced odds of being retained in treatment of any kind in the 6 months after being diagnosed with PTSD (odds ratio [OR] = 0.76; CI = 0.63, 0.90; $P < .001$). This reduced treatment retention rate was mainly due to lower rates of retention in pharmacotherapy (OR = 0.68; CI = 0.56, 0.83; $P < .001$), given that retention in psychotherapy did not significantly differ between groups (OR = 0.93; CI = 0.70, 1.22; $P > .05$). Latino Veterans were similarly less likely to be retained in pharmacotherapy (OR = 0.76; CI = 0.62, 0.94; $P < .01$). Although we did not distinguish between those Veterans who received only one versus more than one evidence-based medication, the odds of switching medications did not differ across racial/ethnic groups ($\chi^2 = 5.3$, df = 7, $P > .1$).

Across the sample, anticipated access barriers adversely affected the odds of retention in psychotherapy, but not pharmacotherapy (psychotherapy: OR = 0.55; CI = 0.50, 0.80; $P < .001$; pharmacotherapy: OR = 0.92; CI = 0.78, 1.10; $P > .05$), and contributed to reduced retention in either modality (OR = 0.79; CI = 0.67, 0.92; $P < .01$). Notably, access barriers did not contribute to reduced pharmacotherapy retention rates observed for African American and Latino Veterans.

Beliefs about psychotherapy, antidepressants, and medications in general, prospectively predicted treatment retention in an expected manner—positive beliefs

TABLE 1. Sample characteristics

Categorical predictors	*N* (%)[a]
Gender	
Female	1,056 (16%)
Male	5,722 (84%)
Age	
34 years and younger	1,416 (21%)
35–44 years	859 (13%)
45–54 years	732 (11%)
55–64 years	2,804 (41%)
65 years and older	967 (14%)
Race/ethnicity (from survey)	
White	3,000 (44%)
Native American	369 (5%)
African American	1,318 (19%)
Asian American	167 (3%)
Hispanic or Latino	1,358 (20%)
Native Hawaiian or Pacific Islander	147 (2%)
Native American and White	284 (4%)
Hispanic and White	135 (2%)
Perceived need for care (from survey)	
Need care now	5,301 (78%)
Do not need care now	1,321 (20%)
Served in Operation Iraqi Freedom or Operation Enduring Freedom (OIF/OEF status from survey)	
Yes	1,899 (28%)
No	4,853 (72%)
Receives VA disability (service connected)	
Yes	4,432 (65%)
No	2,346 (35%)
Household income (from survey)	
Less than $10,000	1,066 (16%)
$10–20,000	1,434 (21%)
$20–40,000	2,166 (32%)
$40–50,000	897(13%)
More than $50,000	990 (15%)
Index clinic type where PTSD diagnosed	
PTSD specialty clinic	642 (10%)
General mental health clinic	2,514 (37%)
Primary care clinic	3,622 (53%)
Receives VA primary care	
Yes	4,356 (64%)
No	2,422 (36%)
Anticipated access barriers (from survey)	
No anticipated treatment barriers	3,210 (47%)
One barrier	1,775 (26%)
Two or more barriers	1,793 (26%)
Continuous measures	**Mean (SD)**
PTSD Checklist (from survey)	57.6 (±15.0)
Veterans SF-12 Mental Health Quality of Life (from survey)	33.37 (±11.7)
Drive time to nearest VA facility (in minutes)	26.9 (±34.9)
Beliefs about medication benefits (from survey)	8.59 (±1.4)
Beliefs about medication harms/overuse (from survey)	18.9 (±3.9)
Beliefs about antidepressants (from survey)	15.28 (±2.9)
Beliefs about psychotherapy (from survey)	12.18 (±1.9)

Notes: $n = 6,778$. Percents may not add up to 100 due to rounding. Variables from self-report surveys are noted; all others are from VA administrative databases.

[a]Some totals vary across demographic categories due to missing data.

TABLE 2. Unadjusted bivariate associations of predictors and outcomes with race/ethnicity

	Total* (n = 6,788) (%) or mean (±SD)	White (n = 3,000) (%) or mean (±SD)	Native American/ Alaskan (n = 369) (%) or mean (±SD)	Black (n = 1,318) (%) or mean (±SD)	Asian (n = 167) (%) or mean (±SD)	Latino (n = 1,358) (%) or mean (±SD)	Hawaiian/Pacific Islander (n = 147) (%) or mean (±SD)	Native American/ White (n = 284) (%) or mean (±SD)	Latino/White (n = 135) (%) or mean (±SD)
Age									
<35 years	21	22[a]	9[b]	14[c]	32[d]	29[d]	16[a,c]	11[b,c]	31[d]
35–44 years	13	10[a,b]	8[a,b]	18[c]	7[b]	15[c]	16[c]	9[a,b]	13[a,c]
45–54 years	11	8[a]	8[a]	19[b]	8[a]	9[a]	11[a,c]	16[b,c]	12[a,b,c]
55–64 years	41	44[a,b]	52[c]	40[d]	27[e]	36[d]	37[b,d,e]	49[a,c]	34[d,e]
65+ years	14	16[a,b]	22[c]	10[d]	26[c]	11[d,e]	21[b,c]	15[a,b,e]	10[a,d,e]
Female	15	20[a]	5[b]	23[c]	7[b,d]	6[b]	4[b]	15[a,e]	10[d,e]
SF-12 MCS	33.4 (11.7)	34.2 (12.0)[a]	34.1 (11.6)[a,b]	32.5 (11.2)[c,d]	34.9 (12.7)[a]	32.5 (11.3)[c,d]	34.2 (11.4)[a,b,c]	31.6 (12.1)[d]	31.9 (12.2)[b,c,d]
PCL	57.6 (15.0)	55.3 (15.1)[a]	58.4 (15.3)[b]	60.0 (14.2)[b]	55.2 (17.8)[a]	59.5 (14.5)[b]	60.0 (15.6)[b]	59.1 (14.4)[b]	59.3 (14.5)[b]
Perceived need for care	80	76[a]	77[a]	89[b]	75[a]	83[c]	80[a,c]	76[a]	78[a,c]
Index clinic									
MH clinic	37	36[a,b]	31[b]	38[a,c,d]	38[b,c,d]	40[c,d]	46[d]	35[a,b,c]	42[a,c,d]
PTSD clinic	10	9[a]	10[a,b]	11[b]	10[a,b]	9[a]	5[a]	10[a,b]	9[a,b]
Primary care clinic	53	55[a,b]	59[b]	51[c]	52[a,b,c]	52[c]	49[c]	55[a,b,c]	50[a,b,c]
Household income									
<$10,000	16	14[a]	21[b]	19[b,c]	20[b,c]	17[c]	21[b,c]	17[a,b,c]	14[a,b,c]
$10–20,000	22	20[a]	27[b]	23[b,c]	22[a,b,c]	23[b,c]	18[a,c]	21[a,b,c]	19[a,b,c]
$20–40,000	33	33[a]	32[a]	33[a]	32[a]	33[a]	33[a]	34[a]	31[a]
$40–50,000	14	15[a]	8[b]	13[a]	11[a,b]	14[a]	16[a]	13[a]	17[a]
>$50,000	15	18[a]	12[b]	12[b]	16[a,b,c]	13[b,c]	12[a,b,c]	14[a,b,c]	20[a,c]
Service connected	65	65[a,b]	70[b,c]	64[a]	67[a,b,c]	64[a]	67[a,b,c]	72[c]	63[a,b,c]
OEF/OIF Veteran	28	25[a]	14[b]	25[a]	43[c,d]	40[d]	32[a,c]	17[b]	42 [c,d]
VA primary care patient	64	63[a,b]	65[a,b,c]	68[c]	59[b]	63[a,b]	65[a,b,c]	62[a,b,c]	70[a,c]
Drive time minutes (SD)	27 (35)	29 (35)[a]	49 (63)[b]	23 (26)[c]	16 (15)[d]	22 (32)[c,d]	21 (18)[d]	33 (40)[e]	21 (30)[c,d]
Access barriers									
None	47	50[a]	40[b]	49[a]	46[a,b]	45[b]	40[b]	41[b]	49[a,b]
One	26	25[a]	26[a,b]	27[a,b]	24[a,b]	29[b]	32[b]	25[a,b]	24[a,b]
Two or more	27	26[a]	35[b]	24[a]	30[a,b]	26[a]	28[a,b]	34[b]	27[a,b]
BMQ benefits (SD)	8.6 (1.5)	8.7 (1.4)[a]	8.7 (1.4)[a]	8.5 (1.5)[b]	8.6 (1.4)[a,b]	8.3 (1.5)[c]	8.1 (1.6)[c]	8.7 (1.4)[a]	8.6 (1.5)[a,b]
BMQ harm/overuse (SD)	18.9 (3.9)	19.5 (3.8)[a]	18.7 (3.9)[b,c]	18.6 (3.9)[c]	18.1 (3.9)[c,d]	18.4 (3.9)[c]	17.5 (4.0)[d]	19.3 (3.7)[a,b]	18.6 (3.6)[b,c]
Beliefs antidepressants (SD)	15.3 (2.9)	15.7 (2.9)[a]	15.3 (2.7)[a,b]	15.0 (2.9)[b,c]	15.0 (3.0)[b,c]	14.9 (2.9)[c]	14.1 (2.6)[d]	15.3 (3.1)[b]	15.3 (2.6)[a,b,c]
Beliefs psychotherapy (SD)	12.2 (1.9)	12.1 (1.8)[a]	12.1 (1.8)[a]	12.4 (1.8)[b]	11.9 (2.0)[a]	12.2 (1.9)[a]	12.0 (1.8)[a]	12.1 (1.8)[a]	12.2 (1.8)[a,b]
Outcomes									
4 Months SSRI/SNRIs	18	20[a]	17[a]	18[a]	18[a]	18[a]	16[a]	18[a]	16[a]
Eight sessions psychotherapy	8	8[a,b]	6[b]	9[a]	6[a,b]	9[a]	8[a,b]	9[a,b]	12[a]
Not enough of any treatment	76	76[a]	80[a]	75[a]	80[a]	76[a]	78[a]	76[a]	74[a]

Notes: Groups with different superscripts statistically differ ($P < .05$); however, no adjustments were made for multiple comparisons.
*Percentiles do not add up to 100 because of rounding. The number of cases included in each association may vary due to missing data.

TABLE 3. Odds of psychotherapy retention

Predictor	At least 8 sessions OR (CI)	Add access variables OR (CI)	Add belief variables OR (CI)
<35 years	1.08 (0.72,1.60)	1.15(0.68,1.96)	1.08(0.63,1.84)
35–44 years	1.21 (0.80,1.81)	1.28(0.80,2.05)	1.20(0.75,1.94)
45–54 years	1.68 (1.13,2.51)[b]	1.76(1.14,2.72)[b]	1.72(1.12,2.64)[b]
55–64 years	1.42 (1.00,2.01)[a]	1.39(0.97,1.99)	1.38(1.02,1.78)
65+ years	Reference	Reference	Reference
Female	1.44 (1.10,1.88)[b]	1.43(1.08,1.90)[b]	1.38(0.96,1.98)[a]
Male	Reference	Reference	Reference
African American	0.93 (0.70,1.22)	0.85(0.64,1.13)	0.83(0.62,1.10)
Native American	0.79 (0.47,1.31)	0.85(0.51,1.43)	0.83(0.50,1.40)
Asian	0.87 (0.41,1.87)	0.88(0.41,1.92)	0.91(0.42,1.98)
Hispanic/Latino	1.20 (0.91,1.58)	1.17(0.88,1.55)	1.15(0.87,1.52)
Hawaiian/Pacific Islander	0.99 (0.40,2.46)	1.01(0.39,2.63)	1.01(0.40,2.56)
Native American/White	1.15 (0.74,1.79)	1.23(0.78,1.96)	1.23(0.76,1.97)
Hispanic/White	1.44 (0.74,2.79)	1.36(0.71,2.60)	1.32(0.70,2.49)
White	Reference	Reference	Reference
SF-12 MHQOL 10 pt	0.84 (0.74,0.94)[b]	0.86(0.77,0.97)[b]	0.85(0.76,0.96)[b]
PCL 10 pt	1.07 (0.97,1.19)	1.08(0.98,1.20)	1.10(0.99,1.22)
Perceived need care	4.07 (2.45,6.77)[c]	3.30(1.95,5.58)[c]	3.05(1.83,5.06)[c]
General MH clinic		2.73(2.19,3.40)[c]	2.73(2.19,3.40)[c]
PTSD clinic		4.34(3.25,5.81)[c]	4.34(3.25,5.81)[c]
Primary care		Reference	Reference
Income 10–20K		0.95(0.70,1.30)	0.95(0.70,1.30)
Income 20–40K		0.78(0.58,1.06)	0.79(0.59,1.05)
Income 40–50K		0.91(0.63,1.31)	0.90(0.62,1.31)
Income 50K+		0.59(0.40,0.87)[b]	0.60(0.41,0.88)[b]
Income <10K		Reference	Reference
Service connected		0.88(0.72,1.07)	0.90(0.74,1.09)
OEF/OIF status		0.84(0.61,1.16)	0.86(0.62,1.19)
VA PC in prior year		0.82(0.67,0.99)[a]	0.84(0.69,1.03)
Drive time 15 min		0.92(0.85,0.99)[a]	0.92(0.85,1.00)a
One access barrier		0.63(0.44,0.71)[c]	0.64(0.51,0.82)[c]
Two or more barriers		0.55(0.50,0.80)[c]	0.57(0.44,0.72)[c]
BMQ benefits 2 pt			0.88(0.76,1.02)
BMQ harms 4 pt			0.94(0.84,1.06)
Antidepressant beliefs 3 pt			1.13(0.99,1.28)
Psychotherapy beliefs 3 pt			1.26(1.11,1.43)[c]

Notes: [a]$P < .05$; [b]$P < .01$; [c]$P < .001$.

about psychotherapy facilitated retention in psychotherapy and positive beliefs about antidepressants facilitated retention in pharmacotherapy. Inclusion of treatment-related beliefs made the reduced odds of pharmacotherapy retention among Latino Veterans no longer significant and reduced, but did not eliminate, the lower odds among African American Veterans (Latino: OR = 0.85; CI = 0.68, 1.05; $P > .05$; African American: OR = 0.76; CI = 0.62, 0.95; $P < .01$).

Models for study outcomes of retention in psychotherapy, retention in pharmacotherapy, and retention in any treatment (either psychotherapy or pharmacotherapy) were comparable in the set of analyses using only treatment initiators and multiple imputation for missing items (data not shown). More specifically, ORs and CIs were equivalent in both direction and magnitude across the two sets of analyses.

To determine if the variation in treatment retention were due to Latino and African American Veterans initiating pharmacotherapy later in the 6-month follow-up period than Whites, we conducted a sensitivity analysis examining time from the diagnostic appointment to first prescription release. No significant differences in the timing of pharmacotherapy initiation were observed ($F = 0.74$, df = 7, $P > .1$).

DISCUSSION

In this large prospective national cohort study of Veterans recently diagnosed with PTSD, we found low overall rates of retention in pharmacotherapy and psychotherapy. Consistent with our first hypothesis, we found that these retention rates varied by Veteran race/ethnicity when treatment need was considered. More specifically, we found lower odds of retention in pharmacotherapy for Latino and African American Veterans relative to Whites. Importantly, that African Americans were also found to have lower odds of retention in treatment overall, indicates that reduced pharmacotherapy retention rates were not compensated

TABLE 4. Odds of PTSD pharmacotherapy retention

Predictor	At least 4 months Rx OR (CI)	Add access variables OR (CI)	Add belief variables OR (CI)
<35 years	1.27 (0.97,1.66)	1.16(0.81,1.66)	1.16(0.79,1.71)
35–44 years	1.64 (1.23, 2.19)[c]	1.56(1.12,2.15)[b]	1.58(1.13,2.21)[b]
45–54 years	1.22 (0.89,1.67)	1.20(0.86,1.68)	1.23(0.88,1.72)
55–64 years	1.09 (0.86,1.38)	1.09(0.86,1.38)	1.18(0.92,1.51)
65+ years	Reference	Reference	Reference
Female	1.05 (0.84,1.30)	1.05(0.84,1.30)	1.06(0.84,1.33)
Male	Reference	Reference	Reference
African American	0.68 (0.56,0.83)[c]	0.66(0.54,0.81)[c]	0.76(0.62,0.95)[b]
Native American	0.81 (0.56,1.16)	0.85(0.59,1.22)	0.89(0.62,1.28)
Asian	1.16 (0.71,1.90)	1.19(0.74,1.93)	1.35(0.82,2.23)
Hispanic/Latino	0.76 (0.62,0.94)[b]	0.75(0.61,0.93)[b]	0.85(0.68,1.05)
Hawaiian/Pacific Islander	0.57 (0.29,1.14)	0.50(0.23,1.05)	0.66(0.31,1.38)
Native American/White	0.83 (0.57,1.20)	0.85(0.59,1.25)	0.89(0.62,1.28)
Hispanic/White	0.81 (0.48,1.37)	0.76(0.45,1.29)	0.77(0.45,1.32)
White	Reference	Reference	Reference
SF-12 MHQOL 10 pt	0.83 (0.76,0.90)[c]	0.84(0.77,0.91)[c]	0.83(0.76,0.90)[c]
PCL 10 pt	1.17 (1.09,1.25)[c]	1.18(1.10,1.26)[c]	1.20(1.12,1.29)[c]
Perceived need care	3.69 (2.74,4.97)[c]	3.33(2.48,4.47)[c]	3.19(2.37,4.29)[c]
General MH clinic		1.79(1.54,2.08)[c]	1.81(1.56,2.11)[c]
PTSD clinic		1.23(0.95,1.60)	1.23(0.95,1.60)
Primary care		Reference	Reference
Income 10–20K		1.14(0.91,1.42)	1.14(0.91,1.44)
Income 20–40K		1.00(0.81,1.24)	1.01(0.81,1.26)
Income 40–50K		1.04(0.80,1.35)	1.05(0.80,1.37)
Income 50K+		1.01(0.79,1.30)	0.98(0.76,1.26)
Income <10K		Reference	Reference
Service connected		0.83(0.71,0.96)[b]	0.89(0.76,1.03)
OEF/OIF status		1.02(0.80,1.29)	1.06(0.83,1.35)
VA PC in prior year		1.01(0.87,1.18)	1.02(0.87,1.20)
Drive time 15 min		0.94(0.90,1.00)[a]	0.95(0.90,1.00)
One access barrier		0.90(0.75,1.06)	0.97(0.81,1.16)
Two or more barriers		0.92(0.78,1.10)	0.97(0.81,1.15)
BMQ benefits 2 pt			1.14(1.02,1.28)[a]
BMQ harms 4 pt			1.09(0.99,1.20)
Antidepressant beliefs 3 pt			1.51(1.36,1.68)[c]
Psychotherapy beliefs 3 pt			0.84 (0.76,0.94)[b]

Notes: [a]$P < .05$; [b]$P < .01$; [c]$P < .001$.

for by increases in psychotherapy. These findings are consistent with reduced mental health treatment retention rates among minorities found in other studies, including Veterans.[24–27]

Contrary to our second hypothesis, inclusion of access factors in the model did not significantly impact the odds of pharmacotherapy retention among African American and Latino Veterans. This suggests that factors other than treatment access must account for racial/ethnic variation in treatment retention rates. It may be that inclusion of access factors failed to influence variation in treatment retention rates across groups because we sampled only Veterans already using VA services. In so doing, we may have inadvertently excluded those more affected by access barriers. However, because access factors had little impact on retention rates for pharmacotherapy across the sample, this seems less likely.

Consistent with our third hypothesis, inclusion of treatment belief variables in the model decreased the magnitude of the reduced odds of pharmacotherapy retention for Latino Veterans. The reduced odds of pharmacotherapy retention, and treatment retention overall, for African Americans was only slightly diminished by inclusion of treatment-related beliefs, indicating that our hypothesis was only partially supported for this group. This suggests that lower odds of treatment retention, particularly pharmacotherapy retention, observed among African American Veterans reflects a disparity as defined by the IOM.[33]

One significant limitation of this study is that we have no information about treatments Veterans may have received from non-VA sources, and findings might have differed had this information been known. However, minority Veterans and those with PTSD are more

TABLE 5. Odds of retention in either pharmacotherapy or psychotherapy

Predictor	Retention any treatment OR (CI)	Add access variables OR (CI)	Add belief variables OR (CI)
<35 years	1.17 (0.92,1.50)	1.06(0.76,1.47)	1.04(0.75,1.45)
35–44 years	1.49 (1.16,1.91)[b]	1.41(1.05,1.88)[a]	1.40(1.05,1.87)[a]
45–54 years	1.39 (1.05,1.83)[a]	1.36(1.02,1.82)[a]	1.39(1.03,1.86)[a]
55–64 years	1.17 (0.94,1.45)	1.16(0.94,1.43)	1.23(0.99,1.48)
65+ years	Reference	Reference	Reference
Female	1.22 (1.00,1.48)[a]	1.23(1.01,1.49)[a]	1.21(0.99,1.48)
Male	Reference	Reference	Reference
African American	0.76 (0.63,0.90)[c]	0.71(0.59,0.86)[c]	0.78(0.64,0.94)[b]
Native American	0.79 (0.57,1.09)	0.85(0.61,1.19)	0.86(0.62,1.21)
Asian	0.96 (0.61,1.50)	0.97(0.62,1.51)	1.06(0.68,1.59)
Hispanic/Latino	0.86 (0.71,1.03)	0.83(0.69,1.01)	0.91(0.75,1.10)
Hawaiian/Pacific Islander	0.67 (0.38,1.20)	0.60(0.32,1.21)	0.74(0.40,1.36)
Native American/White	0.92 (0.67,1.27)	0.97(0.70,1.35)	0.98(0.71,1.36)
Hispanic/White	1.06 (0.68,1.63)	0.98(0.62,1.54)	0.99(0.62,1.59)
White	Reference	Reference	Reference
SF-12 MHQOL 10 pt	0.82 (0.76,0.89)[c]	0.83(0.77,0.90)[c]	0.82(0.75,0.89)[c]
PCL 10 pt	1.13 (1.06,1.21)[c]	1.14(1.07,1.22)[c]	1.17(1.10,1.25)[c]
Perceived need for care	4.09 (3.16,5.29)[c]	3.55(2.72,4.61)[c]	3.32(2.57,4.30)[c]
General MH clinic		2.15(1.86,2.47)[c]	2.15(1.87,2.48)[c]
PTSD clinic		2.09(1.68,2.60)[c]	2.09(1.68,2.60)[c]
Primary care		Reference	Reference
Income 10–20K		1.14(0.93,1.40)	1.14(0.93,1.40)
Income 20–40K		0.97(0.79,1.19)	0.97(0.79,1.19)
Income 40–50K		1.03(0.80,1.32)	1.02(0.80,1.32)
Income >50K		0.89(0.71,1.23)	0.86(0.69,1.10)
Income <10K		Reference	Reference
Service connected		0.82(0.72,0.94)[b]	0.86(0.75,0.99)[a]
OEF/OIF status (reference: not OEF/OIF)		1.02(0.83,1.27)	1.06(0.85,1.32)
VA primary care in prior year		0.94(0.82,1.07)	0.95(0.83,1.09)
Drive time 15 min		0.93(0.89,0.98)[b]	0.94(0.89,0.98)[b]
No access barriers		Reference	Reference
One access barrier (reference: no barriers)		0.79(0.67,0.92)[b]	0.83(0.72,0.97)[a]
Two or more barriers		0.79(0.67,0.92)[b]	0.82(0.69,0.97)[a]
BMQ benefits 2 pt			1.06(0.96,1.18)
BMQ harms 4 pt			1.03(0.95,1.13)
Antidepressant beliefs 3 pt			1.39(1.26,1.54)[c]
Psychotherapy beliefs 3 pt			0.97(0.88,1.07)

Notes: [a]$P < .05$; [b]$P < .01$; [c]$P < .001$.

likely to preferentially use VA healthcare services,[60] suggesting that inclusion of non-VA service use might augment, rather than diminish, observed racial/ethnic group differences. Another limitation is that we do not know the quality of the treatments provided. It is possible that African American and Latino Veterans were less likely to be retained in pharmacotherapy because the treatments they received were different and/or less helpful than those received by Whites.[61,62] If so, then our findings may significantly underestimate the racial/ethnic disparity in PTSD treatment in the VA. Previously, we found that expanding the outcome to include nonevidence-based medications increased the disparity for African American and Latino Veterans,[31] suggesting that the narrower medication outcome used here may underestimate retention disparities overall. Because we did not take into account medication changes in our outcome measure, it is possible that results would have differed had we done so; however, given that the odds of receiving more than one medication did not differ across groups, it seems less likely that accounting for those changes would affect the finding of differential retention rates. More likely, inclusion of medication changes would lower retention rates across the sample.

We do not know the content of the psychotherapy sessions; consequently, a lack of disparity in the quality of psychotherapy cannot be concluded from these data. Disparities may also be underestimated among the smaller racial/ethnic groups who evidenced comparably lower retention rates. The absence of statistical significance for those group differences may reflect power limitations rather than true equity. Given low rates of women in some racial/ethnic groups, interactions between gender and race/ethnicity could not be assessed but should be examined in future studies.

We relied on patient self-report to classify Veterans into racial and ethnic groups, and this survey methodology may have resulted in misclassifications. Finally, although we attempted to adjust for item missingness and nonresponse bias by using multiple imputation and propensity scores, we cannot be sure that the adjustments eliminated all bias.

CONCLUSION AND CLINICAL IMPLICATIONS

During the course of treatment, patients acquire additional information about their providers, treatment efficacy and side effects, and about ongoing logistical barriers. Numerous factors may contribute to racial/ethnic healthcare disparities, including quality of patient–provider interactions, of treatments and, to some extent, patient beliefs.[38–40,44,59,63–66] Even though the IOM definition of disparity considers patient beliefs as an "admissible" source of variation, it will be important to ascertain if beliefs reflect true differences in informed life choices or limited health literacy.[67] Future studies should examine whether there is racial/ethnic variation in the quality of care provided, in the nature of the patient–provider interaction, or in the frequency of visits or types of providers seen. Clinicians may minimize ambivalence about specific treatment options by addressing negative beliefs or misinformation about them before treatment is initiated.[44] Even among Veterans with limited health literacy, however, there is a desire for involvement in healthcare decision making,[68] suggesting that efforts beyond greater information provision will be needed to eliminate the observed lower mental health treatment retention rates of some racial/ethnic minorities with PTSD.

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