



Military Service and Military Health Care Coverage are Associated with Reduced Racial Disparities in Time to Mental Health Treatment Initiation

Simon B. Goldberg^{1,2} · John C. Fortney^{3,4,5} · Jessica A. Chen^{3,5} · Bessie A. Young^{3,6} · Keren Lehavot^{3,4,5} · Tracy L. Simpson^{5,7}

© Springer Science+Business Media, LLC, part of Springer Nature 2020

Abstract

We aimed to evaluate whether military service and access to veteran health care coverage attenuates racial/ethnic disparities in time to mental health treatment initiation for posttraumatic stress disorder (PTSD), major depressive disorder, and/or alcohol-use disorder. Results are based on 13,528 civilians and 1392 veterans from NESARC-III. Among civilians, racial/ethnic minorities reported longer time to PTSD and depression treatment initiation than non-Hispanic whites. Among veterans, racial/ethnic minorities did not differ from whites in time to PTSD and depression treatment initiation, and showed shorter time to treatment initiation for alcohol-use disorder treatment. Racial/ethnic minorities with past year veteran health care coverage showed the strongest evidence for attenuated disparities.

Keywords Military veterans · Racial/ethnic minorities · Mental health disparities

Electronic supplementary material The online version of this article (<https://doi.org/10.1007/s10488-020-01017-2>) contains supplementary material, which is available to authorized users.

✉ Simon B. Goldberg
sbgoldberg@wisc.edu

- ¹ Department of Counseling Psychology, University of Wisconsin – Madison, 335 Education Building, 1000 Bascom Mall, Madison, WI 53706, USA
- ² Center for Healthy Minds, University of Wisconsin – Madison, Madison, WI, USA
- ³ Health Services Research & Development (HSR&D) Center of Innovation (COIN), VA Puget Sound Health Care System, Seattle, WA, USA
- ⁴ Department of Health Services, University of Washington, Seattle, WA, USA
- ⁵ Department of Psychiatry & Behavioral Sciences, University of Washington, Seattle, WA, USA
- ⁶ Division of Nephrology, Department of Medicine, University of Washington, Seattle, WA, USA
- ⁷ Center of Excellence in Substance Abuse and Treatment (CESATE), VA Puget Sound Health Care System, Seattle, WA, USA

Introduction

Historically, there have been wide racial and ethnic (racial/ethnic) disparities in mental health care utilization, quality, and treatment outcomes in the United States (US) (Cook et al. 2007; Creedon and Cook 2016; Department of Health and Human Services 2001). Despite some indications these disparities may have reduced in recent years (Agency for Healthcare Research and Quality 2017), racial/ethnic differences in mental health care remain, and may contribute to the increased disease burden and persistence of mental illness among racial/ethnic minorities (Alegría et al. 2008; Breslau et al. 2005; McGuire and Miranda 2008).

One point of vulnerability for racial/ethnic minorities within the mental health care system appears to be at treatment initiation (Cook et al. 2014). Racial/ethnic minorities are less likely to initiate mental health treatment, and, when initiation does occur, are more likely to have delayed treatment for a longer period of time (Wang et al. 2005). Given available behavioral and pharmacological interventions, delay of treatment and failure to initiate treatment are associated with adverse mental health and functional outcomes (Kessler et al. 1995; Kohn et al. 2004).

Racial/ethnic minorities experience greater barriers to mental health treatment initiation than non-Hispanic whites

due in part to economic injustice and disparities in access to health insurance (Bailey et al. 2017; McGuire and Miranda 2008). These factors represent social determinants of access to health care as well, which can contribute to delays in seeking treatment.

One social determinant that may attenuate racial/ethnic disparities in access to mental health treatment is military service where some racial/ethnic minority groups (e.g., non-Hispanic blacks) are overrepresented relative to the general population (Department of Veterans Affairs 2017). There are numerous benefits associated with military service, including training and professional advancement opportunities during active duty along with access to mental health services pre- and post-discharge (Watkins et al. 2011). This is important as health care coverage has been shown previously to explain large proportions of racial/ethnic disparities in access to medical care generally (Hargraves and Hadley 2003). Since 9/11, VHA and other veteran service organizations have conducted intensive outreach and public health campaigns seeking to engage veterans in mental health care (National Academies of Sciences, Engineering, and Medicine 2018). Recent empirical investigations suggest post-9/11 veterans may show reduced delay to treatment relative to civilians for common psychiatric conditions (e.g., depression, post-traumatic stress disorder [PTSD]; (Goldberg et al. 2019). However, concerns regarding racial/ethnic disparities in treatment engagement and outcome among veterans persist (Lee-Tauler et al. 2018; Saha et al. 2008; Trivedi et al. 2011).

To our knowledge, no population-based study has examined the degree to which racial/ethnic minority veterans delay mental health treatment relative to both racial/ethnic minority civilians, and non-Hispanic white veterans and civilians. Further, it is unclear the degree to which utilization of veteran health care coverage attenuate disparities.

The current study aimed to assess whether racial/ethnic disparities in mental health treatment seeking for psychiatric conditions common in the veteran population (PTSD, major depressive disorder, alcohol-use disorder) were attenuated for military veterans compared to civilians, and whether attenuation was more pronounced among veterans who had veteran health care coverage in the past 12 months (e.g., VHA, TRICARE).

Method

All procedures for NESARC-III data collection were approved by the Institutional Review Boards of the National Institutes of Health and Westat, Inc. The current study was approved by the Institutional Review Board at the VA Puget Sound Health Care System in Seattle, WA.

Conceptual Model

By focusing only on individuals with lifetime psychiatric diagnoses, we employ a definition of health disparity consistent with prior literature (Cook et al. 2014; McGuire and Miranda 2008) and the Institute of Medicine *Unequal Treatment* report (Institute of Medicine 2002) (i.e., differences in health care quality not due to differences in clinical need). That is to say, we focused on individuals meeting diagnostic criteria for psychiatric conditions therefore meeting thresholds for clinical need.

Sample

Data were drawn from the National Epidemiologic Survey on Alcohol and Related Conditions-III (NESARC-III), a nationally representative survey of the general US population (Grant et al. 2015). NESARC-III included a representative sample of non-institutionalized US residents age 18 years and older who were not active duty military during 2012–2013 (Grant et al. 2015). Individual counties or groups of contiguous counties served as the primary sampling units; census-defined blocks served as the secondary sampling units; and households within secondary sampling units served as the tertiary sampling units, with eligible adults randomly selected within households (Grant et al. 2015). Racial/ethnic minority groups were oversampled. The full NESARC-III sample was 36,309 respondents. The response rate was 60.1%, which is comparable to other US national surveys (Bureau of the Census 2017).

The full sample included all individuals who met lifetime diagnoses of PTSD, major depressive disorder, and/or alcohol use disorder who could be classified as a veteran or non-veteran based on available data ($n = 14,920$). Analyses were conducted examining individuals meeting criteria for each diagnostic category separately. The three subsamples were as follows: PTSD ($n = 2335$), major depressive disorder ($n = 7407$), and alcohol-use disorder ($n = 9942$). Descriptive information pertaining to each subsample is contained in Tables 1, 2, and 3. The full analytic sample is smaller than the sum of the three subsamples due to the presence of comorbidity (i.e., individuals meeting criteria for more than one of the three disorders).

Measures

Psychiatric Diagnoses and Symptom Severity

The Alcohol Use Disorder and Associated Disabilities Interview Schedule 5 (AUDADIS-5) is a structured,

Table 1 Lifetime PTSD sample characteristics

Study variable	White civilian	REM civilian	White vet VA	REM vet VA	White vet no VA	REM vet no VA
Total n	1178	928	55	60	78	36
Male, n (%)	251 (24.34)	245 (29.69)	46 (85.85)	48 (87.85)	58 (72.80)	29 (85.78)
Age, n (%)						
18–29	251 (23.92)	243 (28.14)	6 (8.32)	7 (10.90)	9 (10.33)	1 (0.81)
30–44	374 (29.06)	329 (34.64)	9 (15.67)	17 (29.21)	11 (18.24)	12 (28.41)
45–64	443 (38.61)	304 (31.58)	27 (47.37)	28 (38.10)	40 (47.38)	19 (61.20)
65+	110 (8.41)	52 (5.64)	13 (28.63)	8 (21.79)	18 (24.05)	4 (9.57)
Race/ethnicity, n (%)						
White, NH	1178 (100.00)	0 (0.00)	55 (100.00)	0 (0.00)	78 (100.00)	0 (0.00)
Black, NH	0 (0.00)	420 (36.02)	0 (0.00)	34 (45.49)	0 (0.00)	24 (63.96)
Other, NH	0 (0.00)	105 (19.18)	0 (0.00)	8 (22.32)	0 (0.00)	7 (28.43)
Hispanic	0 (0.00)	403 (44.80)	0 (0.00)	18 (32.19)	0 (0.00)	5 (7.61)
Married, n (%)	491 (50.62)	311 (41.37)	26 (60.93)	29 (59.38)	24 (43.71)	15 (56.73)
Income <20k, n (%)	407 (28.93)	414 (35.98)	10 (16.28)	12 (14.11)	28 (29.02)	11 (29.14)
Sx age, M (SD)	23.64 (17.14)	22.96 (16.43)	24.34 (10.32)	24.19 (13.20)	27.31 (18.26)	23.75 (9.19)
Some College, n (%)	704 (59.25)	424 (48.08)	39 (70.28)	49 (80.74)	56 (66.77)	26 (62.46)
Unemployed, n(%)	287 (24.00)	280 (26.48)	19 (34.81)	17 (29.50)	18 (22.99)	14 (53.10)
Tx seek, n (%)	741 (63.46)	456 (47.08)	39 (63.07)	47 (82.68)	45 (62.86)	28 (74.65)
Type of tx sought, n (%)						
Formal	729 (62.24)	441 (44.67)	39 (63.07)	47 (82.68)	44 (61.90)	28 (74.65)
Informal	191 (16.14)	141 (14.91)	13 (23.98)	16 (28.03)	16 (25.38)	13 (40.95)
Tx age, M (SD)	27.57 (20.70)	26.91 (23.30)	36.53 (18.99)	33.69 (17.25)	31.45 (24.50)	30.16 (17.85)
Time to tx, M (SD)	5.20 (15.03)	5.65 (15.50)	11.48 (18.83)	9.81 (17.44)	4.71 (11.85)	6.56 (14.21)
Sx count, M (SD)	15.52 (3.34)	15.81 (3.63)	16.16 (2.36)	16.27 (3.12)	15.92 (3.18)	16.09 (4.69)

Total PTSD sample n = 2335

REM racial/ethnic minority, VA indicated access to Veterans Health Administration (VHA) or TRICARE coverage in the past year, NH non-Hispanic, 20k \$20,000, Tx treatment, Sx symptom, M mean, SD standard deviation, PTSD posttraumatic stress disorder

in-person diagnostic interview used to measure DSM-5 criteria for PTSD, major depressive disorder, and alcohol-use disorder (Hasin et al. 2015a, b). To receive a lifetime diagnosis of PTSD, an individual had to report witnessing, learning about, or experiencing at least one of 19 potentially traumatic events (Criterion A) along with ≥ 1 intrusion symptoms (Criterion B), ≥ 1 avoidance symptoms (Criterion C), ≥ 3 negative mood or cognitive changes (Criterion D), and ≥ 3 increased arousal symptoms (Criterion E). Requiring ≥ 3 D and E symptoms is higher than the two required for DSM-5 criteria; however, this definition has been used in other studies based on NESARC-III (Lehavot et al. 2018). Major depressive disorder and alcohol-use disorder diagnoses were consistent with DSM-5 criteria (Grant et al. 2015). In addition to lifetime diagnoses, counts of lifetime symptoms of PTSD (out of 20 potential symptoms), major depressive disorder (out of nine), and alcohol use-disorder (out of 11) were computed as metrics of severity (Hasin et al. 2015a, b).

Time to Treatment Initiation

Among those meeting lifetime diagnostic criteria for PTSD, major depressive disorder, or alcohol-use disorder, separate items assessed age of onset and age at time any help was first received for that disorder, if ever.

For survival analyses, the dependent variable was the length of time (in years) between onset of diagnosis and first receipt of care. Those who did not report ever receiving treatment at the time of the survey were censored. A portion of respondents reported receiving treatment at an age younger than that of diagnosis onset, yielding negative values for estimates of time to treatment ($n = 95$, 4.1% for PTSD; $n = 552$, 7.5% for major depressive disorder; $n = 455$, 4.6% for alcohol-use disorder). Due to concerns of introducing bias through imputation of our dependent variable, these negative values were coded as missing. Veteran status was not associated with the likelihood of reporting a negative time to treatment (Supplemental Materials Table 1). With two exceptions, racial/ethnic minority status was not

Table 2 Lifetime major depressive disorder sample characteristics

Study variable	White civilian	REM civilian	White vet VA	REM vet VA	White vet no VA	REM vet no VA
Total n	4296	2604	121	73	227	86
Male, n (%)	1185 (30.10)	729 (30.93)	91 (78.70)	57 (84.97)	192 (88.23)	70 (83.15)
Age, n (%)						
18–29	813 (20.11)	711 (29.01)	10 (6.22)	11 (11.82)	13 (4.80)	4 (4.39)
30–44	1208 (26.14)	920 (33.79)	18 (16.03)	14 (25.02)	40 (17.01)	27 (31.14)
45–64	1733 (41.26)	789 (29.85)	66 (54.49)	42 (54.91)	102 (43.15)	46 (54.71)
65+	542 (12.49)	184 (7.36)	27 (23.26)	6 (8.24)	72 (35.04)	9 (9.76)
Race/ethnicity, n (%)						
White, NH	4296 (100.00)	0 (0.00)	121 (100.00)	0 (0.00)	227 (100.00)	0 (0.00)
Black, NH	0 (0.00)	1090 (32.82)	0 (0.00)	39 (41.40)	0 (0.00)	52 (50.91)
Other, NH	0 (0.00)	370 (21.41)	0 (0.00)	6 (10.71)	0 (0.00)	16 (29.81)
Hispanic	0 (0.00)	1144 (45.77)	0 (0.00)	28 (47.89)	0 (0.00)	18 (19.28)
Married, n (%)	1968 (55.65)	941 (43.88)	51 (51.89)	28 (41.78)	95 (56.53)	34 (51.76)
Income <20k, n (%)	1018 (19.12)	964 (31.27)	30 (16.73)	20 (22.09)	52 (20.40)	17 (18.23)
Sx age, M (SD)	28.81 (16.48)	27.93 (16.90)	34.29 (15.30)	32.44 (13.96)	36.62 (17.76)	33.37 (13.53)
Some college, n (%)	2962 (67.96)	1350 (53.30)	86 (73.23)	56 (76.95)	157 (68.65)	61 (62.25)
Unemployed, n (%)	659 (14.58)	589 (20.52)	33 (26.09)	20 (27.85)	29 (13.73)	19 (26.90)
Tx seek, n (%)	3227 (74.64)	1419 (54.24)	94 (79.95)	55 (80.15)	151 (66.74)	46 (58.54)
Type of tx sought, n (%)						
Formal	3184 (73.70)	1377 (52.59)	92 (78.25)	53 (77.77)	150 (66.57)	45 (57.31)
Informal	704 (14.89)	366 (13.64)	28 (20.42)	14 (24.25)	38 (17.40)	18 (23.32)
Tx age, M (SD)	31.02 (18.52)	30.37 (22.90)	39.32 (16.84)	34.39 (17.45)	37.98 (20.91)	37.61 (17.67)
Time to tx, M (SD)	3.91 (10.43)	3.94 (12.81)	5.6 (14.99)	4.38 (8.24)	3.7 (11.32)	4.48 (14.10)
Sx count, M (SD)	7.45 (1.50)	7.54 (1.53)	7.5 (1.62)	7.43 (1.78)	7.43 (1.42)	7.57 (1.49)

Total MDD sample $n = 7407$

REM racial/ethnic minority, VA indicated access to Veterans Health Administration (VHA) or TRICARE coverage in the past year, NH non-Hispanic, 20k \$20,000, Tx treatment, Sx symptom, M mean, SD standard deviation, PTSD posttraumatic stress disorder

associated with the likelihood of reporting a negative time to treatment. Among those with alcohol-use disorder diagnoses, non-Hispanic blacks were more likely to report a negative time to treatment initiation and non-Hispanic individuals of other race/ethnicity were less likely to report a negative time to treatment initiation, relative to non-Hispanic whites. However, these differences were small in magnitude.

Explanatory Variables

The primary explanatory variables of interest were racial/ethnic minority status, veteran status, access to veteran health care and their interactions. Race/ethnicity was self-assessed in five categories: non-Hispanic white; non-Hispanic black; non-Hispanic American Indian/Alaska Native; non-Hispanic Asian/Native Hawaiian/Other Pacific Islander; and Hispanic, any race. There was a relatively small number of non-Hispanic black ($n = 271$), Hispanic ($n = 120$), non-Hispanic American Indian/Alaska Native ($n = 40$), and non-Hispanic Asian/Native Hawaiian/Other Pacific Islander ($n = 19$) veterans meeting lifetime diagnoses of PTSD, major

depressive disorder, and/or alcohol-use disorder, with cell sizes further reduced when disaggregated based on past year veteran health care coverage. Therefore, to increase statistical power and reliability of model estimates, a dichotomous racial/ethnic minority status variable was created indicating non-Hispanic white (referred to as white below) and racial/ethnic minority. To further increase statistical power, we also combined the pre- and post-911 era veteran samples, although we have previously reported that pre-911 veterans delay seeking treatment significantly longer than post-911 veterans.

Veteran status was assessed using the question: “Have you ever served on Active Duty in the U.S. Armed Forces, Military Reserves, or National Guard?” Respondents answering “Yes, on active duty in past, but not now” were classified as veterans. Those indicating training in National Guard/Reserve only ($n = 200$) or with unknown veteran status ($n = 8$) were excluded from analyses.

Access to veteran health care was assessed with a survey item that asked veteran respondents whether they were enrolled in VHA, CHAMPVA or CHAMPUS/TRICARE

Table 3 Lifetime alcohol-use disorder sample characteristics

Study variable	White civilian	REM civilian	White vet VA	REM vet VA	White vet no VA	REM Vet no VA
Total n	5411	3442	244	158	499	188
Male, n (%)	2739 (54.73)	1828 (56.76)	207 (88.71)	137 (86.87)	450 (91.47)	169 (93.89)
Age, n (%)						
18–29	1483 (27.64)	1239 (38.05)	26 (9.79)	18 (11.83)	25 (3.29)	13 (5.20)
30–44	1742 (30.68)	1204 (34.40)	30 (11.50)	30 (20.52)	109 (22.75)	56 (35.11)
45–64	1870 (35.94)	880 (24.12)	102 (42.32)	84 (47.69)	219 (41.16)	101 (49.40)
65+	316 (5.74)	119 (3.43)	86 (36.39)	26 (19.96)	146 (32.79)	18 (10.28)
Race/ethnicity, n (%)						
White, NH	5411 (100.00)	0 (0.00)	244 (100.00)	0 (0.00)	499 (100.00)	0 (0.00)
Black, NH	0 (0.00)	1511 (33.26)	0 (0.00)	99 (49.45)	0 (0.00)	101 (45.84)
Other, NH	0 (0.00)	439 (20.58)	0 (0.00)	19 (16.96)	0 (0.00)	32 (22.34)
Hispanic	0 (0.00)	1492 (46.16)	0 (0.00)	40 (33.59)	0 (0.00)	55 (31.82)
Married, n (%)	2533 (56.43)	1225 (43.26)	125 (62.84)	61 (48.28)	261 (66.88)	79 (54.72)
Income <20k, n (%)	1108 (16.82)	1217 (28.65)	55 (15.45)	44 (20.97)	82 (12.54)	62 (27.29)
Sx age, M (SD)	25.5 (12.41)	26.61 (13.82)	28.29 (20.18)	28.88 (17.39)	28.78 (15.64)	31.22 (18.03)
Some college, n (%)	3777 (68.97)	1722 (53.02)	165 (69.54)	108 (70.98)	329 (65.75)	125 (63.72)
Unemployed, n (%)	757 (13.46)	837 (21.65)	44 (16.04)	44 (25.39)	66 (12.15)	44 (25.36)
Tx seek, n (%)	1114 (19.89)	624 (17.22)	68 (23.08)	65 (37.82)	126 (22.28)	58 (30.95)
Type of tx sought, n (%)						
Formal	942 (16.63)	503 (14.07)	58 (18.23)	58 (34.43)	105 (18.61)	45 (23.63)
Informal	887 (15.65)	517 (13.88)	55 (19.52)	53 (31.10)	106 (18.84)	52 (27.16)
Tx age, M (SD)	28.79 (26.72)	29.59 (30.37)	30.57 (21.89)	32.37 (19.17)	31.81 (25.49)	33.48 (31.80)
Time to tx, M (SD)	6.11 (20.06)	6.37 (24.78)	8.22 (16.85)	9.16 (18.24)	8.06 (19.66)	7.27 (21.59)
Sx count, M (SD)	5.74 (3.35)	5.53 (3.54)	5.98 (3.15)	6.37 (3.79)	5.82 (3.25)	6.18 (3.61)

Total AUD sample n=9946

REM racial/ethnic minority, VA indicated access to Veterans Health Administration (VHA) or TRICARE coverage in the past year, NH non-Hispanic, 20k \$20,000, Tx treatment, Sx symptom, M mean, SD standard deviation, AUD alcohol-use disorder

coverage in the past 12 months. This variable, referred to as VHA/TRICARE, was set to zero for civilian respondents. CHAMPVA is coverage only available to dependents of veterans and thus, was not a relevant response option for veterans. TRICARE is coverage only available to retired military personnel. VHA is coverage available to individuals who served in the active military and were separated under conditions other than dishonorable. We created a three-category variable reflecting VHA/TRICARE coverage crossed with veteran status (civilian, veterans with or without past year VHA/TRICARE coverage).

A sensitivity analysis (described below) assessed the degree to which findings related to VHA/TRICARE persisted when the sample was restricted to veterans and civilians with any form of past year health insurance coverage. An individual (veteran or civilian) was coded as insured if they indicated past year coverage through Medicare, Medicaid, veteran health care, private insurance through employer, private insurance directly purchased, private insurance through government program, or any other government or state-sponsored health insurance.

Demographic Covariates

Demographic characteristics that could not be influenced by military service (age [18–29, 30–44, 45–64, 65 or older, gender [male, female]) that have been previously linked with treatment seeking (Hale et al. 2017; Olfson et al. 2012) were included as covariates. Sensitivity analyses included demographics that could be influenced by military service and linked with treatment seeking (marital status [married, not married], income [greater than \$20,000 per year, not greater than \$20,000 per year], employment [employed, unemployed], education [some college or more, less than some college]). These were viewed as sensitivity analyses as they were conducted to assess whether any observed effect of veteran status on time to treatment initiation was accounted for by demographic factors that could be influenced by military service.

Analysis Procedures

All analyses were adjusted for clustering, oversampling, and non-response and weighted to represent the US population, accounting for the complex survey design of NESARC-III. A Wald test using the ‘regTermTest’ function in the ‘survey’ package in R (Lumley 2017) was used to assess for overall variation in treatment initiation based on a six-level predictor variable that included the cross of racial/ethnic minority status and a three-level veteran status variable (i.e., civilian, veteran with past year VHA/TRICARE coverage, veteran without past year VHA/TRICARE coverage), when controlling for age and gender. Survival analysis was used to model time to treatment initiation, while accounting for individuals who had not received treatment at the time of the assessment (right censoring) (Lumley 2017). Cox proportional hazard models were constructed using the ‘svycoxph’ function in the ‘survey’ package in R (Lumley 2017). Hazard ratios represent the ratio of hazard rates between two groups (i.e., rate of occurrence of a particular event, in this case initiating treatment). Therefore, a higher hazard ratio represents a shorter time to treatment initiation relative to the reference group (i.e., the target group is more likely than the reference group to have engaged with treatment at a given point in time). Models were run separately for each diagnostic category (PTSD, major depressive disorder, alcohol-use disorder), using the subsample of individuals who met criteria for a lifetime diagnosis of the given disorder. Individuals could be in more than one of the subsamples and age of onset and treatment seeking could vary by disorder.

In order to assess whether military service was associated with reduced racial/ethnic disparities in time to mental health treatment initiation, the initial Cox models included veteran status, racial/ethnic minority status, and the interaction between veteran status and racial/ethnic minority status as predictors of time to treatment initiation (i.e., time between onset and treatment), while controlling for the non-modifiable demographic characteristics of age and gender (Table 4, Specification 1). Follow-up models used a four-category predictor variable with specification of the reference group varied across models to examine all contrasts of interest (i.e., white civilians vs. racial/ethnic minority civilians, white veterans vs. white civilians, racial/ethnic minority veterans vs. racial/ethnic minority civilians; Table 4, Specifications 2, 3, and 4). Sensitivity analyses were conducted adding demographic and clinical characteristics that could have been impacted by military service (see Table 4).

In order to assess whether potential racial/ethnic disparities were associated with VHA/TRICARE coverage, subsequent models included racial/ethnic minority status, a three-category veteran status variable (civilians, veterans with past year VHA/TRICARE coverage, veterans without past year VHA/TRICARE coverage), and the interaction

between racial/ethnic minority status and the three-category veteran status variable (Table 5, Specification 1). To examine all contrasts of interest, a six-category predictor variable was used, crossing racial/ethnic minority status with the three categories of veteran status (Table 5, Specification 2 through 6). As before, sensitivity analyses were conducted adding modifiable demographic and clinical characteristics that could have been impacted by military service (see Table 5). A final sensitivity analysis was conducted restricting the sample to individuals with past year insurance (i.e., VHA/TRICARE coverage or any other insurance) (Hale et al. 2017). Kaplan–Meier models (Therneau and Grambsch 2000) were constructed to display unadjusted survival curves for the group represented in the six-category predictor.

Results

The full sample included 14,920 respondents with a lifetime diagnosis of PTSD ($n = 2335$), major depressive disorder ($n = 7407$), and/or alcohol-use disorder ($n = 9942$; Tables 1, 2, 3). This included 13,528 civilians ($n = 5405$ racial/ethnic minorities) and 1,392 veterans ($n = 450$ racial/ethnic minorities). Among veterans, 527 reported past year VHA/TRICARE coverage ($n = 206$ racial/ethnic minorities).

Rates of treatment seeking for all three disorders varied across the six-category predictor variable (Wald tests for the six-category crossing of racial/ethnic minority status, veteran status, and past year VHA/TRICARE coverage, $ps < 0.010$). Racial/ethnic minority veterans with past year VHA/TRICARE coverage were the most likely to have sought treatment for all three disorders (weighted percentages = 82.7%, 80.2%, and 37.8%, for PTSD, major depressive disorder, and alcohol-use disorder, respectively). Racial/ethnic minority civilians were the least likely to have sought treatment for all three disorders (weighted percentages = 47.1%, 54.2%, and 17.2%, for PTSD, major depressive disorder, and alcohol-use disorder, respectively). Consistent with prior reports, (Grant et al. 2015; Kohn et al. 2004) treatment seeking was lowest for alcohol-use disorder across all racial/ethnic groups.

The first specification examined the interaction between racial/ethnic minority status and veteran status as a predictor of time to treatment initiation (Table 4, Specification 1). In age and gender-adjusted Cox proportional hazards, a significant interaction was found between racial/ethnic minority status and veteran status predicting shorter time to treatment initiation for all three disorders (adjusted hazard ratios [AHRs] = 1.75, 1.33, and 1.93, for PTSD, major depressive disorder, and alcohol-use disorder, respectively, with whites and civilians specified as the reference groups). When additional demographic covariates were added, this

Table 4 Cox proportional hazard models predicting time to treatment initiation by racial/ethnic minority status and veteran status

Model	Predictor	Age, gender, and race/ethnicity adjusted			Additional covariates		
		PTSD	MDD	AUD	PTSD	MDD	AUD
Specification 1	REM X veteran	1.75 [1.20, 2.56]	1.33 [1.00, 1.75]	1.93 [1.36, 2.75]	1.80 [1.24, 2.62]	1.26 [0.95, 1.67]	1.46 [1.03, 2.05]
Specification 2	White civilian	Ref	Ref	Ref	Ref	Ref	Ref
	REM civilian	0.69 [0.60, 0.79]	0.65 [0.61, 0.70]	1.05 [0.92, 1.21]	0.69 [0.61, 0.80]	0.68 [0.63, 0.73]	0.93 [0.81, 1.06]
	REM veteran	1.31 [0.98, 1.74]	0.96 [0.76, 1.21]	1.65 [1.26, 2.18]	1.15 [0.87, 1.52]	0.88 [0.69, 1.11]	1.21 [0.93, 1.58]
	White veteran	1.09 [0.82, 1.44]	1.10 [0.94, 1.29]	0.81 [0.65, 1.02]	0.92 [0.69, 1.23]	1.03 [0.88, 1.20]	0.90 [0.72, 1.12]
Specification 3	REM civilian	Ref	Ref	Ref	Ref	Ref	Ref
	REM veteran	1.90 [1.42, 2.55]	1.46 [1.15, 1.86]	1.57 [1.18, 2.08]	1.66 [1.25, 2.21]	1.30 [1.02, 1.66]	1.31 [0.99, 1.73]
	White veteran	1.58 [1.19, 2.10]	1.69 [1.43, 1.98]	0.77 [0.60, 0.98]	1.33 [0.98, 1.78]	1.53 [1.30, 1.80]	0.97 [0.76, 1.22]
Specification 4	White veteran	Ref	Ref	Ref	Ref	Ref	Ref
	REM veteran	1.20 [0.85, 1.72]	0.87 [0.66, 1.14]	2.04 [1.47, 2.82]	1.25 [0.88, 1.77]	0.85 [0.65, 1.12]	1.35 [0.99, 1.85]
	Male	0.91 [0.78, 1.07]	0.70 [0.65, 0.76]	1.36 [1.19, 1.55]	0.98 [0.84, 1.15]	0.73 [0.68, 0.79]	1.15 [1.01, 1.31]
	Age						
	18–29	Ref	Ref	Ref	Ref	Ref	Ref
	30–44	0.89 [0.75, 1.04]	1.07 [0.98, 1.16]	0.86 [0.70, 1.05]	0.83 [0.71, 0.98]	1.03 [0.95, 1.12]	0.83 [0.68, 1.00]
	45–64	0.70 [0.59, 0.83]	0.88 [0.81, 0.96]	0.97 [0.80, 1.17]	0.70 [0.59, 0.83]	0.88 [0.81, 0.96]	0.82 [0.68, 0.98]
	65+	0.37 [0.28, 0.50]	0.69 [0.60, 0.78]	0.80 [0.61, 1.05]	0.39 [0.29, 0.54]	0.76 [0.67, 0.87]	0.80 [0.62, 1.03]
	Married				0.95 [0.84, 1.08]	1.03 [0.96, 1.09]	0.69 [0.61, 0.78]
	Income < \$20 k				0.92 [0.80, 1.06]	0.91 [0.84, 0.98]	0.93 [0.81, 1.07]
	Some college				1.47 [1.28, 1.69]	1.26 [1.17, 1.35]	1.19 [1.05, 1.35]
	Unemployed				1.06 [0.91, 1.23]	1.14 [1.06, 1.23]	1.25 [1.08, 1.44]
	Sx count				1.06 [1.03, 1.09]	1.12 [1.09, 1.15]	1.54 [1.50, 1.59]
	Comorbid PTSD				NA	1.13 [1.04, 1.22]	1.05 [0.90, 1.23]
	Comorbid MDD				1.02 [0.90, 1.16]	NA	0.98 [0.87, 1.11]
Comorbid AUD				0.95 [0.83, 1.08]	1.07 [1.01, 1.14]	NA	

Coefficients represent adjusted hazard ratios (AHRs) associated with each predictor along with 95% confidence intervals. Specification 1 included veteran status, racial/ethnic minority status, and their interaction as predictors, with white civilians as the reference group. Subsequent models used a four-level predictor crossing racial/ethnic minority status and veteran status. The reference group was modified across Specifications 2 to 4 to allow for interpretation of all contrasts. The first three columns adjusted for only age, gender, and race/ethnicity. The final three columns added additional covariates (marital status, income, education, employment, symptom count, and comorbidity). Reference group varied across Specifications 1 to 4. Sample size = 2162, 6664, and 9302 for PTSD, MDD, and AUD models, respectively. Redundant contrasts are not reported in the table to save space.

PTSD posttraumatic stress disorder, *MDD* major depressive disorder, *AUD* alcohol-use disorder, *White* non-Hispanic white, *REM* racial/ethnic minority, *20 K* \$20,000, *Sx* symptom; *VA* indicated access to Veterans Health Administration (VHA) or TRICARE coverage in the past year.

interaction remained significant for PTSD and alcohol-use disorder (AHRs = 1.80 and 1.46, respectively), but not major depressive disorder (AHR = 1.26 [0.95, 1.67]).

In the second specification where white civilians were specified as the reference group (Table 4, Specification 2), racial/ethnic minority civilians showed longer time to treatment initiation than white civilians (age and gender-AHRs = 0.69 and 0.65, for PTSD and major depressive disorder, respectively). No racial/ethnic disparity in alcohol-use disorder time to treatment initiation was observed among civilians (AHR = 1.05). White veterans did not differ from white civilians in time to treatment initiation for any of the three disorders.

In the third specification where racial/ethnic minority civilians were specified as the reference group (Table 4,

Specification 3), racial/ethnic minority veterans showed shorter time to treatment initiation than racial/ethnic minority civilians for all three disorders, both with and without additional demographic covariates (AHRs = 1.30 to 1.90), with the exception of alcohol-use disorder for which the contrast was no longer significant when additional covariates were included (AHR = 1.31 [0.99, 1.73]).

In the fourth specification where white veterans were specified as the reference group (Table 4, Specification 4), racial/ethnic minority veterans did not differ in time to treatment initiation relative to white veterans in any model. In fact, the disparity was reversed in the age and gender-adjusted model for alcohol-use disorder, such that racial/ethnic minority veterans were less likely than white veterans to delay treatment (AHR = 2.04).

Table 5 Cox proportional hazard models predicting time to treatment initiation by racial/ethnic minority status, veteran status, and VHA/TRICARE health care coverage

Model	Predictor	Age, gender, and race/ethnicity adjusted			Additional covariates		
		PTSD	MDD	AUD	PTSD	MDD	AUD
Specification 1	REM X veteran X VA						
	Veteran no VA x REM	1.54 [0.85, 2.81]	1.10 [0.72, 1.69]	1.63 [0.98, 2.71]	1.55 [0.87, 2.79]	1.07 [0.70, 1.62]	1.28 [0.77, 2.13]
	Veteran VA x REM	1.94 [1.20, 3.13]	1.57 [1.12, 2.21]	2.29 [1.44, 3.63]	2.06 [1.27, 3.35]	1.49 [1.03, 2.15]	1.72 [1.10, 2.71]
Specification 2	White civilian	Ref	Ref	Ref	Ref	Ref	Ref
	REM civilian	0.69 [0.60, 0.79]	0.65 [0.61, 0.70]	1.05 [0.92, 1.21]	0.69 [0.61, 0.80]	0.68 [0.63, 0.73]	0.93 [0.81, 1.06]
	REM veteran no VA	1.20 [0.73, 1.98]	0.75 [0.51, 1.09]	1.38 [0.89, 2.15]	1.09 [0.67, 1.77]	0.71 [0.49, 1.03]	1.11 [0.72, 1.72]
	White veteran no VA	1.13 [0.80, 1.61]	1.04 [0.85, 1.27]	0.81 [0.62, 1.05]	1.01 [0.71, 1.43]	0.99 [0.81, 1.21]	0.93 [0.72, 1.21]
	REM veteran VA	1.39 [1.02, 1.88]	1.26 [0.97, 1.64]	2.02 [1.48, 2.75]	1.18 [0.88, 1.59]	1.11 [0.83, 1.50]	1.33 [0.98, 1.81]
	White veteran VA	1.04 [0.70, 1.54]	1.22 [0.98, 1.52]	0.84 [0.59, 1.18]	0.83 [0.54, 1.26]	1.11 [0.89, 1.39]	0.83 [0.60, 1.16]
Specification 3	REM civilian	Ref	Ref	Ref	Ref	Ref	Ref
	REM veteran no VA	1.75 [1.06, 2.89]	1.14 [0.78, 1.68]	1.31 [0.84, 2.05]	1.57 [0.96, 2.56]	1.06 [0.73, 1.53]	1.20 [0.77, 1.87]
	White veteran no VA	1.64 [1.15, 2.35]	1.59 [1.29, 1.95]	0.77 [0.58, 1.01]	1.45 [1.02, 2.08]	1.46 [1.19, 1.80]	1.01 [0.77, 1.32]
	REM veteran VA	2.01 [1.48, 2.74]	1.92 [1.47, 2.51]	1.91 [1.39, 2.64]	1.71 [1.26, 2.30]	1.65 [1.22, 2.22]	1.43 [1.04, 1.97]
	White veteran VA	1.50 [1.01, 2.24]	1.87 [1.49, 2.34]	0.79 [0.55, 1.13]	1.19 [0.78, 1.82]	1.64 [1.30, 2.06]	0.90 [0.64, 1.26]
Specification 4	White veteran VA	Ref	Ref	Ref	Ref	Ref	Ref
	REM veteran no VA	1.16 [0.64, 2.13]	0.61 [0.40, 0.94]	1.66 [0.96, 2.85]	1.32 [0.72, 2.41]	0.64 [0.42, 0.99]	1.34 [0.79, 2.28]
	White veteran no VA	1.09 [0.66, 1.81]	0.85 [0.64, 1.13]	0.97 [0.65, 1.44]	1.22 [0.73, 2.05]	0.89 [0.67, 1.19]	1.13 [0.76, 1.66]
	REM veteran VA	1.34 [0.85, 2.11]	1.03 [0.74, 1.44]	2.41 [1.55, 3.75]	1.43 [0.90, 2.28]	1.01 [0.70, 1.45]	1.60 [1.04, 2.46]
Specification 5	White veteran no VA	Ref	Ref	Ref	Ref	Ref	Ref
	REM veteran no VA	1.06 [0.59, 1.91]	0.72 [0.47, 1.10]	1.71 [1.05, 2.80]	1.08 [0.61, 1.90]	0.72 [0.48, 1.09]	1.19 [0.73, 1.94]
	REM veteran VA	1.22 [0.79, 1.89]	1.21 [0.88, 1.67]	2.50 [1.71, 3.65]	1.17 [0.77, 1.78]	1.13 [0.80, 1.59]	1.42 [0.97, 2.07]
Specification 6	REM veteran VA	Ref	Ref	Ref	Ref	Ref	Ref
	REM veteran no VA	0.87 [0.50, 1.51]	0.59 [0.38, 0.94]	0.69 [0.41, 1.16]	0.92 [0.54, 1.56]	0.64 [0.40, 1.02]	0.84 [0.50, 1.42]

Coefficients represent adjusted hazard ratios (AHRs) associated with each predictor along with 95% confidence intervals. Specification 1 included a three-level veteran status variable (i.e., civilian, veteran with past year VHA/TRICARE coverage, veteran without past year VHA/TRICARE coverage), racial/ethnic minority status, and their interaction as predictors, with white civilians as the reference group. Subsequent models used a six-level predictor crossing the three-level veteran status variable with racial/ethnic minority status. The reference group was modified across Specifications 2 to 6 to allow for interpretation of all contrasts. The first three columns adjusted for only age, gender, and race/ethnicity. The final three columns added additional covariates (marital status, income, education, employment, symptom count, and presence of comorbid PTSD, MDD, and/or AUD). AHRs not displayed for covariates as results are identical with Table 4

White non-Hispanic white, *REM* racial/ethnic minority, *Sx* symptom, *PTSD* posttraumatic stress disorder, *MDD* major depressive disorder, *AUD* alcohol use disorder, *VA* indicated access to Veterans Health Administration (VHA) or TRICARE coverage in the past year, *NH* non-Hispanic

Predicting Time to Treatment Initiation by Racial/Ethnic Minority Status, Veteran Status, and Past Year VHA/TRICARE

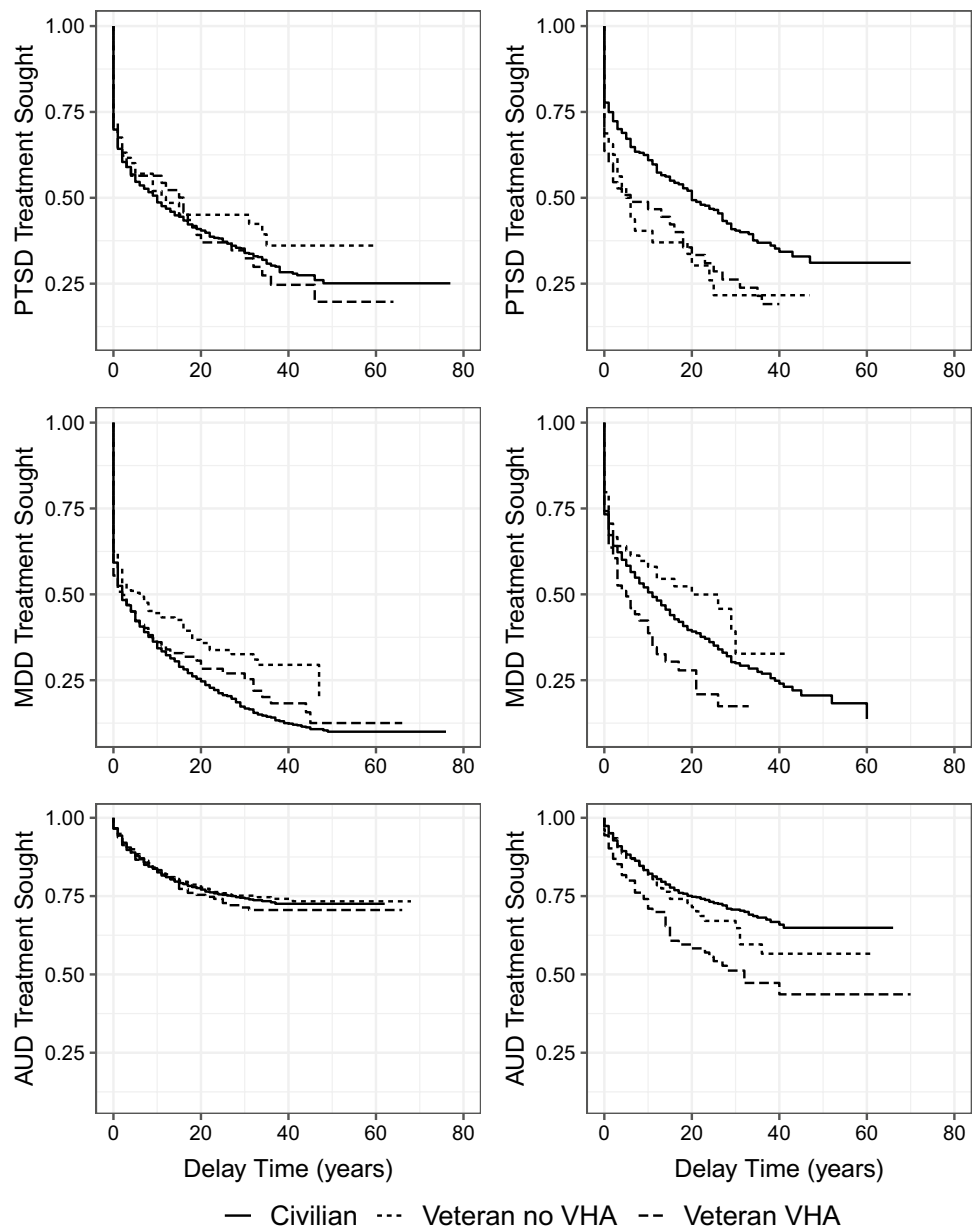
In order to examine whether racial/ethnic disparities were further moderated by VHA/TRICARE coverage, subsequent models included the interaction between racial/ethnic minority status and a three-level veteran status variable (civilians, veterans with past year VHA/TRICARE coverage, veterans without past year VHA/TRICARE coverage). In the first specification (Table 5, Specification 1), a significant interaction was found between veterans with past year VHA/TRICARE coverage and racial/ethnic minority status predicting shorter time to treatment initiation for all three disorders

(AHRs = 1.49 to 2.29, with whites and civilians specified as the reference groups).

In the second specification where white civilians were specified as the reference group (Table 5, Specification 2), no differences in time to treatment initiation were found between white civilians and white veterans with or without past year VHA/TRICARE coverage.

In the third specification where racial/ethnic minority civilians were specified as the reference group (Table 5, Specification 3, Fig. 1), racial/ethnic minority veterans with past year VHA/TRICARE coverage showed shorter time to treatment initiation relative to racial/ethnic minority civilians for all three disorders (AHRs = 1.43 to 2.01). In contrast, racial/ethnic minority veterans without past year

Fig. 1 Survival curves with unadjusted Kaplan–Meier estimates predicting mental health treatment seeking from veteran status and past year VHA health care coverage. Curves are for illustrative purposes only. Left column reflects curves for non-Hispanic whites and right column reflect curves for racial/ethnic minorities. PTSD post-traumatic stress disorder, MDD major depressive disorder, AUD alcohol-use disorder



VHA/TRICARE coverage did not differ from racial/ethnic minority civilians in their time to treatment initiation, in all but one model. For PTSD, racial/ethnic minority veterans without past year VHA/TRICARE showed shorter time to treatment initiation relative to racial/ethnic minority civilians in the age and gender-adjusted model (AHR = 1.75, Table 5, Specification 3).

In a specification where racial/ethnic minority veterans with past year VHA/TRICARE coverage were specified as the reference group (Table 5, Specification 6), no differences in time to treatment initiation were found between racial/ethnic minority veterans without past year VHA/TRICARE coverage and racial/ethnic minority veterans with past year VHA/TRICARE coverage (AHRs = 0.69 to 0.92, with one exception: racial/ethnic minority veterans without past year VHA/TRICARE coverage showed longer time to treatment initiation for depression than racial/ethnic minority veterans with past year VHA/TRICARE in the age and gender-adjusted model (AHR = 0.59).

A final set of sensitivity analyses examined the degree to which findings related to VHA/TRICARE coverage persisted when the sample was restricted to civilians and veterans with past year health insurance coverage. Table 6 displays coefficients mirroring those reported in Table 5 but restricted to the proportion of the sample with past year health insurance coverage. Key contrasts remained largely unchanged in this analysis. In particular, there remained no differences in time to treatment initiation between white civilians and white veterans with or without past year VHA/TRICARE coverage (Table 6, Specification 2). Racial/ethnic minority veterans with past year VHA/TRICARE coverage continued to show shorter time to treatment initiation relative to racial/ethnic minority civilians for all three disorders (AHRs = 1.55 to 1.89; Table 6, Specification 3), with one exception. For alcohol-use disorder, racial/ethnic minority veterans no longer differed from racial/ethnic minority civilians in time to treatment initiation when additional covariates were included (AHR = 1.36 [0.97, 1.89]). Racial/ethnic minority veterans without past year VHA/TRICARE coverage did not differ from racial/ethnic minority civilians in their time to treatment initiation in any model (Table 6, Specification 3). Similar to before, no differences in time to treatment initiation were found between racial/ethnic minority veterans without past year VHA/TRICARE and racial/ethnic minority veterans with past year VHA/TRICARE coverage.

Discussion

Racial/ethnic disparities in mental health treatment initiation have been well documented within the civilian population. Compared to whites, racial/ethnic minorities are less likely

to initiate mental health treatment and more likely to delay treatment (Cook et al. 2014; Wang et al. 2005). A variety of factors have been proposed to account for this disparity, including differential access to health care coverage, economic injustice, and experiences of racism and discrimination in the context of health care (Bailey et al. 2017; Merino et al. 2018; van Ryn and Fu 2003).

The current study evaluated whether military service is a factor that may attenuate this racial/ethnic disparity. Using data from a nationally representative survey, we found evidence that racial/ethnic disparities in time to mental health treatment initiation were reduced for military veterans. While we found racial/ethnic minority civilians showed longer time to treatment initiation for PTSD and major depressive disorder than white civilians, this difference was not present for racial/ethnic minority veterans relative to white veterans. Further, racial/ethnic minority veterans received treatment sooner than racial/ethnic minority civilians in age and gender-adjusted models, which was not the case for white veterans versus civilians. Shortened time to treatment initiation for racial/ethnic minority veterans relative to racial/ethnic minority civilians remained significant when adjusting for additional demographic and clinical covariates for PTSD and major depressive disorder, but not alcohol-use disorder. This suggests that additional demographic (e.g., unemployment, income) and clinical (e.g., alcohol-use disorder symptom count) variables may account for the reduced time to treatment initiation for alcohol-use disorder for racial/ethnic minority veterans relative to racial/ethnic minority civilians.

Subsequent analyses examined past year VHA/TRICARE coverage as one potential factor contributing to attenuated racial/ethnic disparities in time to treatment initiation. When compared with racial/ethnic minority civilians, racial/ethnic minority veterans with past year VHA/TRICARE coverage showed significantly shorter time to treatment for all three disorders. This was not true for racial/ethnic minorities without VHA/TRICARE coverage, except for those with PTSD (and this did not hold up after adjusting for all demographic and clinical characteristics). This suggests that VHA/TRICARE coverage may be partially responsible for attenuating race/ethnic disparities among veterans. These results appeared largely robust in a sensitivity analysis that was restricted to participants with past year health insurance coverage. This suggests that even among those with past year health insurance coverage, reduced racial/ethnic disparities in time to treatment initiation generally remain most pronounced among racial/ethnic minority veterans with VHA/TRICARE coverage.

Taken together, results corroborate previous reports of racial/ethnic disparities in mental health treatment initiation among civilians (Cook et al. 2014; Creedon and Cook 2016; McGuire and Miranda 2008) and indicate that these

Table 6 Sensitivity analysis restricting to sample with past year health insurance coverage

Model	Predictor	Age, gender, and race/ethnicity adjusted			Additional covariates		
		PTSD	MDD	AUD	PTSD	MDD	AUD
Specification 1	REM X veteran X VA						
	Veteran no VA x REM	1.40 [0.71, 2.75]	1.04 [0.65, 1.67]	1.91 [1.08, 3.38]	1.50 [0.77, 2.90]	1.05 [0.67, 1.64]	1.40 [0.78, 2.50]
	Veteran VA x REM	1.95 [1.20, 3.17]	1.48 [1.05, 2.08]	2.15 [1.35, 3.45]	2.08 [1.28, 3.38]	1.41 [0.98, 2.05]	1.63 [1.03, 2.60]
Specification 2	White civilian	Ref	Ref	Ref	Ref	Ref	Ref
	REM civilian	0.68 [0.58, 0.79]	0.69 [0.64, 0.75]	1.13 [0.96, 1.33]	0.67 [0.58, 0.78]	0.71 [0.65, 0.76]	0.96 [0.82, 1.13]
	REM veteran no VA	1.06 [0.59, 1.90]	0.77 [0.51, 1.18]	1.70 [1.04, 2.78]	1.01 [0.58, 1.77]	0.75 [0.50, 1.12]	1.17 [0.70, 1.93]
	White veteran no VA	1.12 [0.78, 1.61]	1.08 [0.87, 1.34]	0.79 [0.59, 1.05]	1.00 [0.69, 1.44]	1.02 [0.82, 1.26]	0.87 [0.65, 1.16]
	REM veteran VA	1.25 [0.91, 1.71]	1.23 [0.95, 1.60]	2.14 [1.56, 2.94]	1.12 [0.83, 1.51]	1.10 [0.81, 1.47]	1.30 [0.95, 1.79]
	White veteran VA	0.95 [0.63, 1.42]	1.21 [0.97, 1.50]	0.88 [0.62, 1.25]	0.80 [0.52, 1.21]	1.10 [0.88, 1.37]	0.83 [0.59, 1.16]
Specification 3	REM civilian	Ref	Ref	Ref	Ref	Ref	Ref
	REM veteran no VA	1.57 [0.87, 2.82]	1.12 [0.73, 1.72]	1.50 [0.91, 2.48]	1.50 [0.85, 2.64]	1.06 [0.71, 1.59]	1.21 [0.72, 2.03]
	White veteran no VA	1.65 [1.14, 2.40]	1.56 [1.25, 1.95]	0.70 [0.51, 0.95]	1.48 [1.02, 2.16]	1.44 [1.15, 1.80]	0.90 [0.66, 1.22]
	REM veteran VA	1.85 [1.34, 2.54]	1.78 [1.37, 2.33]	1.89 [1.36, 2.64]	1.66 [1.22, 2.26]	1.55 [1.15, 2.10]	1.36 [0.97, 1.89]
	White veteran VA	1.40 [0.93, 2.11]	1.75 [1.40, 2.19]	0.78 [0.54, 1.12]	1.18 [0.77, 1.82]	1.56 [1.24, 1.96]	0.86 [0.61, 1.23]
Specification 4	White veteran VA	Ref	Ref	Ref	Ref	Ref	Ref
	REM veteran no VA	1.12 [0.57, 2.19]	0.64 [0.40, 1.03]	1.93 [1.08, 3.46]	1.26 [0.65, 2.45]	0.68 [0.43, 1.07]	1.40 [0.78, 2.52]
	White veteran no VA	1.18 [0.71, 1.96]	0.89 [0.66, 1.20]	0.89 [0.59, 1.35]	1.25 [0.74, 2.11]	0.93 [0.69, 1.25]	1.04 [0.70, 1.57]
	REM veteran VA	1.32 [0.83, 2.09]	1.02 [0.73, 1.42]	2.44 [1.57, 3.79]	1.40 [0.88, 2.22]	1.00 [0.70, 1.43]	1.57 [1.02, 2.43]
Specification 5	White veteran no VA	Ref	Ref	Ref	Ref	Ref	Ref
	REM veteran no VA	0.95 [0.49, 1.83]	0.72 [0.45, 1.15]	2.16 [1.25, 3.73]	1.01 [0.53, 1.92]	0.74 [0.47, 1.15]	1.34 [0.77, 2.35]
	REM veteran VA	1.12 [0.72, 1.73]	1.14 [0.82, 1.59]	2.73 [1.84, 4.05]	1.12 [0.73, 1.72]	1.08 [0.76, 1.53]	1.50 [1.01, 2.24]
Specification 6	REM veteran VA	Ref	Ref	Ref	Ref	Ref	Ref
	REM veteran no VA	0.85 [0.45, 1.59]	0.63 [0.39, 1.03]	0.79 [0.45, 1.39]	0.90 [0.50, 1.64]	0.68 [0.42, 1.12]	0.89 [0.50, 1.60]

Coefficients represent adjusted hazard ratios (AHRs) associated with each predictor along with 95% confidence intervals. Specification 1 included a three-level veteran status variable (i.e., civilian, veteran with past year VHA/TRICARE coverage, veteran without past year VHA/TRICARE coverage), racial/ethnic minority status, and their interaction as predictors, with white civilians as the reference group. Subsequent models used a six-level predictor crossing the three-level veteran status variable with racial/ethnic minority status. The reference group was modified across Specifications 2 to 6 to allow for interpretation of all contrasts. The first three columns adjusted for only age, gender, and race/ethnicity. The final three columns added additional covariates (marital status, income, education, employment, symptom count, and comorbidity). Sample is restricted to those with any past year health insurance coverage

REM racial/ethnic minority, PTSD posttraumatic stress disorder, MDD major depressive disorder, AUD alcohol use disorder, VA indicated access to Veterans Health Administration (VHA) or TRICARE coverage in the past year

disparities may be reduced for military veterans, especially those with veteran health coverage provided by VA or DoD. This is based on models demonstrating similar rates of time to treatment initiation comparing racial/ethnic minority veterans with white veterans and models demonstrating reduced time to treatment initiation comparing racial/ethnic minority veterans with racial/ethnic minority civilians.

The observed pattern of findings—reduced racial/ethnic disparities in delay to mental health treatment initiation for military veterans—could be due to several factors with substantial public health relevance. It is possible that aspects of military training or post-deployment experiences, such as universal mental health screening (Hoge et al. 2014), increase military veterans' awareness of mental health concerns and willingness to seek treatment. Campaigns by the VHA and other veteran service organizations to raise awareness of veteran mental health may also contribute to a reduced racial/ethnic disparity (National Academies of Sciences, Engineering, and Medicine 2018), particularly when coupled with increased availability of services (e.g., through primary care mental health integration; (Post et al. 2010).

Another possibility, and one consistent with the current findings, is that reduced disparities may be associated with increased access to mental health care for racial/ethnic minority veterans through VHA/TRICARE. In our sample, reduced time to treatment initiation was most pronounced for racial/ethnic minority veterans with past year VHA/TRICARE coverage. This is consistent with other studies finding that racial/ethnic disparities in mental health treatment typically found in the civilian population were not evident within the VHA (Glass et al. 2010). Indeed, the VHA may provide a health care setting with unusually equal access to care that may reduce racial/ethnic disparities seen in the civilian population. Of course, given the naturalistic and cross-sectional nature of the current study, it is impossible to demonstrate definitively what may account for the reduced racial/ethnic disparities in delay to treatment observed in the veteran population.

Our study has several limitations. The first is potential recall bias introduced by assessing symptom onset and treatment seeking retrospectively. Recall bias may be particularly impactful for remote events. A second limitation was a lack of information regarding where mental health treatment was received. While it is possible that racial/ethnic disparities in mental health treatment seeking were reduced due to veterans having access to VHA/TRICARE coverage, it was unknown whether treatment was actually received through VHA/TRICARE. Having VHA/TRICARE coverage assessed only in the past year further increases uncertainty regarding the interpretation of this aspect of the study. A third limitation was collapsing across racial/ethnic minority groups which may have obscured important variation across racial/ethnic subgroups. A fourth and related limitation

was the relatively small number of racial/ethnic minority individuals in some cells within our models (e.g., veterans with PTSD and past year VHA/TRICARE coverage). This likely reduced statistical power and generalizability of our conclusions.

These limitations notwithstanding, our results suggest that disparities in mental health treatment initiation typically found between white and racial/ethnic minority individuals are attenuated for racial/ethnic minority veterans, particularly those with health care through VHA/TRICARE. This supports the possibility that military service and benefits available to veterans may reduce disparities seen in the civilian population. Based on beneficial effects of treatment on quality of life and health outcomes, this reduced disparity may have positive downstream public health effects for racial/ethnic minority veterans.

Acknowledgements Dr. Chen was supported by a VA Office of Academic Affiliations' Advanced Fellowship in Health Services Research and Development (TPH 61-000-14). Dr. Lehavot was supported by VA Clinical Science Research & Development (CX000867) Career Development Award (CDA). Dr. Fortney was supported by a VA HSR&D Research Career Scientist Award and a grant (PCS-1406-19295) from the Patient Centered Outcomes Research Institute. Dr. Simpson was supported by the Center on Substance Addiction Treatment and Education (CESATE). The views expressed in this article are solely those of the authors and do not reflect an endorsement or the official policy or position of the Department of Veterans Affairs. Support for this research was also provided by the University of Wisconsin-Madison, Office of the Vice Chancellor for Research and Graduate Education with funding from the Wisconsin Alumni Research Foundation. Dr. Young is supported by the VA Puget Sound Health Care System.

Compliance with Ethical Standards

Conflict of interest The authors declare no conflicts of interest.

Research Involving Human Participants and/or Animals All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee (VA Puget Sound Health Care System IRB and Westat IRB) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

References

- Agency for Healthcare Research and Quality. (2017). *2016 National healthcare quality and disparities report*. Rockville, MD: Agency for Healthcare Research and Quality.
- Alegria, M., Canino, G., Shrout, P. E., Woo, M., Duan, N., Vila, D., et al. (2008). Prevalence of mental illness in immigrant and non-immigrant U.S. Latino Groups. *American Journal of Psychiatry*, *165*(3), 359–369. <https://doi.org/10.1176/appi.ajp.2007.07040704>.
- Bailey, Z. D., Krieger, N., Agénor, M., Graves, J., Linos, N., & Bassett, M. T. (2017). Structural racism and health inequities in

- the USA: Evidence and interventions. *The Lancet*, 389(10077), 1453–1463. [https://doi.org/10.1016/S0140-6736\(17\)30569-X](https://doi.org/10.1016/S0140-6736(17)30569-X).
- Breslau, J., Kendler, K. S., Su, M., Gaxiola-Aguilar, S., & Kessler, R. C. (2005). Lifetime risk and persistence of psychiatric disorders across ethnic groups in the United States. *Psychological Medicine*, 35(3), 317–327. <https://doi.org/10.1017/S0033291704003514>.
- Bureau of the Census. (2017). *American Community Survey, 2012*. Suitland, MD: Bureau of the Census.
- Cook, B. L., McGuire, T., & Miranda, J. (2007). Measuring trends in mental health care disparities, 2000–2004. *Psychiatric Services*, 58(12), 1533–1540. <https://doi.org/10.1176/ps.2007.58.12.1533>.
- Cook, B. L., Zuvekas, S. H., Carson, N., Wayne, G. F., Vesper, A., & McGuire, T. G. (2014). Assessing racial/ethnic disparities in treatment across episodes of mental health care. *Health Services Research*, 49(1), 206–229. <https://doi.org/10.1111/1475-6773.12095>.
- Creedon, T. B., & Cook, B. L. (2016). Access to mental health care increased but not for substance use while disparities remain. *Health Affairs*, 35(6), 1017–1021. <https://doi.org/10.1377/hlthaff.2016.0098>.
- Department of Health and Human Services. (2001). *Mental health: Culture, race, and ethnicity—A supplement to mental health: A report of the surgeon general*. U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services.
- Department of Veterans Affairs. (2017). *Minority veterans report: Military service history and VA benefit utilization statistics*. Washington, DC: Author.
- Glass, J. E., Perron, B. E., Ilgen, M. A., Chermack, S. T., Ratliff, S., & Zivin, K. (2010). Prevalence and correlates of specialty substance use disorder treatment for Department of Veterans Affairs Healthcare System patients with high alcohol consumption. *Drug and Alcohol Dependence*, 112(1), 150–155. <https://doi.org/10.1016/j.drugalcdep.2010.06.003>.
- Goldberg, S. B., Simpson, T. L., Lehavot, K., Chen, J. A., Glass, J. E., Schnurr, P. P., et al. (2019). Mental health treatment delay: A comparison among civilians and veterans of different service eras. *Psychiatric Services*, 70, 358–366.
- Grant, B. F., Goldstein, R. B., Saha, T. D., Chou, S. P., Jung, J., Zhang, H., et al. (2015). Epidemiology of DSM-5 alcohol use disorder: Results from the national epidemiologic survey on alcohol and related conditions III. *JAMA Psychiatry*, 72(8), 757–766. <https://doi.org/10.1001/jamapsychiatry.2015.0584>.
- Hale, A. C., Sripada, R. K., & Bohnert, K. M. (2017). Past-year treatment utilization among individuals meeting DSM-5 PTSD criteria: Results from a nationally representative sample. *Psychiatric Services*, 69(3), 341–344. <https://doi.org/10.1176/appi.ps.201700021>.
- Hargraves, J. L., & Hadley, J. (2003). The contribution of insurance coverage and community resources to reducing racial/ethnic disparities in access to care. *Health Services Research*, 38(3), 809–829. <https://doi.org/10.1111/1475-6773.00148>.
- Hasin, D. S., Greenstein, E., Aivadyan, C., Stohl, M., Aharonovich, E., Saha, T., et al. (2015a). The alcohol use disorder and associated disabilities interview schedule-5 (AUDADIS-5): Procedural validity of substance use disorders modules through clinical re-appraisal in a general population sample. *Drug and Alcohol Dependence*, 148, 40–46. <https://doi.org/10.1016/j.drugalcdep.2014.12.011>.
- Hasin, D. S., Shmulewitz, D., Stohl, M., Greenstein, E., Aivadyan, C., Morita, K., et al. (2015b). Procedural validity of the AUDADIS-5 depression, anxiety and post-traumatic stress disorder modules: Substance abusers and others in the general population. *Drug and Alcohol Dependence*, 152, 246–256. <https://doi.org/10.1016/j.drugalcdep.2015.03.027>.
- Hoge, C. W., Grossman, S. H., Auchterlonie, J. L., Riviere, L. A., Milliken, C. S., & Wilk, J. E. (2014). PTSD Treatment for soldiers after combat deployment: Low utilization of mental health care and reasons for dropout. *Psychiatric Services*, 65(8), 997–1004. <https://doi.org/10.1176/appi.ps.201300307>.
- Institute of Medicine. (2002). *Unequal Treatment: Confronting racial and ethnic disparities in health care*. Washington, DC: National Academies Press.
- Kessler, C., Foster, C. L., Saunders, W. B., & Stang, P. E. (1995). Social consequences of psychiatric disorders I: Educational attainment. *American Journal of Psychiatry*, 152, 1026–1032.
- Kohn, R., Saxena, S., Levav, I., & Saraceno, B. (2004). The treatment gap in mental health care. *World Health Organization Bulletin of the World Health Organization Geneva*, 82(11), 858–866.
- Lee-Tauler, S. Y., Eun, J., Corbett, D., & Collins, P. Y. (2018). A systematic review of interventions to improve initiation of mental health care among racial-ethnic minority groups. *Psychiatric Services*, 69(6), 628–647. <https://doi.org/10.1176/appi.ps.201700382>.
- Lehavot, K., Goldberg, S. B., Chen, J. A., Katon, J. G., Glass, J. E., Fortney, J. C., et al. (2018). Do trauma type, stressful life events, and social support explain women veterans' high prevalence of PTSD? *Social Psychiatry and Psychiatric Epidemiology*, 53(9), 943–953. <https://doi.org/10.1007/s00127-018-1550-x>.
- Lumley, T. (2017). *Survey: Analysis of complex survey samples*.
- McGuire, T. G., & Miranda, J. (2008). New evidence regarding racial and ethnic disparities in mental health: Policy implications. *Health Affairs*, 27(2), 393–403. <https://doi.org/10.1377/hlthaff.27.2.393>.
- Merino, Y., Adams, L., & Hall, W. J. (2018). Implicit bias and mental health professionals: Priorities and directions for research. *Psychiatric Services*, 69(6), 723–725. <https://doi.org/10.1176/appi.ps.201700294>.
- National Academies of Sciences, Engineering, and Medicine. (2018). *Evaluation of the Department of Veterans Affairs Mental Health Services*. Washington, DC: National Academies Press.
- Olfson, M., Liu, S.-M., Grant, B. F., & Blanco, C. (2012). Influence of comorbid mental disorders on time to treatment seeking for major depressive disorder. *Medical Care*, 50(3), 227–232. <https://doi.org/10.1097/MLR.0b013e318241eb5e>.
- Post, E. P., Metzger, M., Dumas, P., & Lehmann, L. (2010). Integrating mental health into primary care within the Veterans Health Administration. *Families, Systems, & Health*, 28(2), 83–90. <https://doi.org/10.1037/a0020130>.
- Saha, S., Freeman, M., Toure, J., Tippens, K. M., Weeks, C., & Ibrahim, S. (2008). Racial and ethnic disparities in the VA health care system: A systematic review. *Journal of General Internal Medicine*, 23(5), 654–671. <https://doi.org/10.1007/s11606-008-0521-4>.
- Therneau, T. M., & Grambsch, P. M. (2000). *Modeling survival data: Extending the Cox model*. New York: Springer.
- Trivedi, A. N., Grebla, R. C., Wright, S. M., & Washington, D. L. (2011). Despite improved quality of care in the Veterans Affairs health system, racial disparity persists for important clinical outcomes. *Health Affairs*, 30(4), 707–715. <https://doi.org/10.1377/hlthaff.2011.0074>.
- van Ryn, M., & Fu, S. S. (2003). Paved with good intentions: Do public health and human service providers contribute to racial/ethnic disparities in health? *American Journal of Public Health*, 93(2), 248–255. <https://doi.org/10.2105/AJPH.93.2.248>.
- Wang, P. S., Berglund, P., Olfson, M., Pincus, H. A., Wells, K. B., & Kessler, R. C. (2005). Failure and delay in initial treatment contact after first onset of mental disorders in the national

comorbidity survey replication. *Archives of General Psychiatry*, 62(6), 603–613. <https://doi.org/10.1001/archpsyc.62.6.603>.
Watkins, K. E., Pincus, H. A., Smith, B., Paddock, S. M., Mannle, T. E., Jr., Woodroffe, A., et al. (2011). *Veterans Health Administration mental health program evaluation*. Santa Monica, CA: RAND Corporation.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.