

TREATMENT UTILIZATION AMONG DIVERSE PATIENTS WITH PTSD:  
NATIONWIDE TRENDS AND MODERATION  
BY HEALTH INSURANCE

by

Katherina Arteaga, B.S.

A thesis submitted to the Graduate Council of  
Texas State University in partial fulfillment  
of the requirements for the degree of  
Master of Arts  
with a Major in Psychological Research  
May 2022

Committee Members:

Alessandro S. De Nadai, Chair

Joseph L. Etherton

Ty S. Schepis

**COPYRIGHT**

by

Katherina Arteaga

2022

## **FAIR USE AND AUTHOR'S PERMISSION STATEMENT**

### **Fair Use**

This work is protected by the Copyright Laws of the United States (Public Law 94-553, section 107). Consistent with fair use as defined in the Copyright Laws, brief quotations from this material are allowed with proper acknowledgement. Use of this material for financial gain without the author's express written permission is not allowed.

### **Duplication Permission**

As the copyright holder of this work I, Katherina Arteaga, authorize duplication of this work, in whole or in part, for educational or scholarly purposes only.

## **ACKNOWLEDGEMENTS**

I would like to express sincere gratitude to my mentor, Dr. Alessandro De Nadai for his continuous support throughout my graduate studies at Texas State University. His patience, enthusiasm, and immense wisdom have taught me to become a better student, researcher, and writer. I have valued his continuous assistance that guided me through the many stages of this project.

I would also like to thank my committee members, Dr. Ty Schepis and Dr. Joe Etherton, for offering their time and support in the completion of this thesis. The advice and suggestions they shared have improved this project immensely. Further, I appreciate Dr. Ty Schepis for providing access to the NESARC-III dataset. Without this, the scope of this project could not have been possible.

## TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS.....	iv
LIST OF TABLES.....	vi
LIST OF ABBREVIATIONS.....	vii
ABSTRACT.....	viii
CHAPTER	
I. INTRODUCTION.....	1
II. METHODS.....	5
III. RESULTS .....	9
IV. DISCUSSION.....	12
REFERENCES .....	20

## LIST OF TABLES

Table	Page
1. Model results using race/ethnicity and insurance status to predict receipt of PTSD-focused psychotherapy .....	18
2. Model results using race/ethnicity and insurance status to predict receipt of any mental health treatment.....	19

## LIST OF ABBREVIATIONS

Abbreviation	Description
AIAN	American Indian/Alaska Native
ANHPI	Asian/Native Hawaiian/Other Pacific Islander
AUD	Alcohol use disorder
DUD	Drug use disorder
IHS	Indian Health Service
NESARC	National Survey on Alcohol and Related Conditions
PTSD	Post traumatic stress disorder
SUD	Substance use disorder

## **ABSTRACT**

Posttraumatic stress disorder (PTSD) is a debilitating mental health condition that is estimated to affect 6% of American adults. Research suggests that racial/ethnic minority groups have elevated risk for experiencing trauma and developing PTSD and they are also less likely to receive treatment. To address this problem, we examined the relationship between treatment utilization for PTSD, race/ethnicity, and health insurance coverage. Data were obtained from a nationally representative dataset (National Epidemiologic Survey on Alcohol and Related Conditions-III). Two series of hierarchical logistic regression models were conducted to estimate likelihood of treatment utilization among varying racial/ethnic groups and insurance status, after first including education and income in models. Results found that insured individuals had more than twice the odds of utilizing PTSD-specific treatment. Black participants were significantly less likely to utilize treatment regardless of insurance status. A significant interaction was also found, where American Indian/Alaska Native participants without insurance were significantly more likely to utilize care compared to White participants without insurance. Centralized healthcare services available to individuals who identify as American Indian/Alaska Native may explain this finding and suggests a model for reducing other group-based disparities.



## I. INTRODUCTION

An estimated 6% of the American population suffers from post-traumatic stress disorder (PTSD) at some point in their lifetime, equating to over 14 million people (Pietrzak et al., 2011). However, many in need of PTSD care do not receive treatment quickly, if at all. Prior research has found that only 59.4% of individuals with lifetime PTSD seek at least one type of treatment, with an average treatment delay of 4.5 years for those who do (Goldstein et al., 2016). Furthermore, those from Black, Hispanic, and American Indian/Alaska Native populations have been observed to have greater exposure to traumatic events and PTSD rates overall (Stephens et al., 2010; Bassett et al., 2014). These groups are also more likely to encounter both barriers to treatment and mental health stigma, which has been associated with mistrust of the mental health care system (Masuda et al., 2009; Masuda et al., 2012; Diala et al., 2000; Whaley, 2001). Lack of medical insurance is another common obstacle to mental health treatment, and it is likely to be important in PTSD as well. Specifically, insured patients are more likely than noninsured patients to receive treatment for a serious mental illness (Walker et al., 2015). Given that demographic minority groups are often less likely to have access to quality health insurance (U.S. Census Bureau, 2021), increased insurance access could help reduce observed PTSD treatment disparities. However, few studies have examined these factors in tandem, which limits our ability to understand the possible equalizing effect of insurance on the disparities in treatment utilization among diverse racial/ethnic groups. In this study, we seek to contextualize prior work and add new and comprehensive information to inform this issue.

## **PTSD Treatment Utilization and Race/Ethnicity**

Across multiple studies, evidence has shown disparities in the PTSD care received by racial/ethnic minority populations. Roberts et al. (2011) used a nationally representative sample to assess racial/ethnic differences in treatment utilization for PTSD and found that racial/ethnic minority participants were less likely to have received treatment compared to White participants. For those who sought treatment, all racial/ethnic minority groups were less likely than White patients to have received help from a doctor, counselor, or hospital. These findings are concerning as a meta-analysis found that evidence-based treatments, such as CBT, are more successful and have larger effect sizes compared to medication-only and group-based therapies (Haagen et al., 2015). Spont et al. (2009) found American Indian/Alaska Native veterans with PTSD to exhibit lower odds of receiving psychiatric medication, while Black veterans with PTSD exhibited lower odds of receiving a medication trial and higher odds of participating in counseling sessions. In a later study, Spont et al. (2017) found that among veterans recently diagnosed with PTSD, Hispanic veterans were less likely to receive any psychotherapy. Among all participants who sought treatment, individuals from racial/ethnic minority groups were less likely to seek individual psychotherapy compared to White veterans. Reasons for lower prevalence of treatment utilization may relate to barriers stemming from historical injustices in health care provisions, such as the deep-rooted racism and segregation in healthcare, and unequal quality of resources (Penner et al., 2007). Recurrent disparities in treatment seeking may further be attributed to structural barriers such as limited access to transportation, care facilities, and health insurance.

## **PTSD Treatment Utilization and Insurance**

Literature suggests that there is an additional relationship between insurance coverage and treatment utilization in individuals with PTSD. Hale et al. (2018) utilized a sample of individuals diagnosed with PTSD and coded individuals as insured if they had any type of insurance within the last 12 months. Results from this study indicated that insured individuals had elevated rates of treatment utilization compared to noninsured individuals. Further, results from Wang et al. (2005) evidenced that unmet need for mental health treatment was elevated for uninsured individuals meeting criteria for a mental health disorder. However, neither study investigated an interaction between race/ethnicity and health insurance coverage as a predictor for PTSD-focused treatment. Goldberg et al. (2020) utilized a veteran and civilian sample to assess the relationship between military health care coverage and treatment utilization in individuals with either PTSD, alcohol use disorder, or major depressive disorder. Veterans from racial/ethnic minority backgrounds with VHA/TRICARE were most likely to seek treatment for either PTSD, alcohol use disorder (AUD), or major depressive disorder (MDD), and they also had a shorter delay in seeking treatment. Comparatively, civilians from racial/ethnic minority groups were the least likely to seek treatment, suggesting a possible buffering effect of insurance coverage against racial/ethnic related barriers to care. Overall, the existing literature points to insurance as a key factor for treatment utilization in individuals with PTSD and other mental illnesses, but further research is necessary to investigate the possible equalizing effect of insurance on racial/ethnic differences in treatment utilization.

## **Present Study**

More information is needed to address disparities in PTSD treatment for those from racial/ethnic minority backgrounds. Research that has looked at group differences and possible ameliorating roles of health insurance has tended to have small sample sizes, include veteran samples only, or include outdated samples that rely on DSM-IV or other older diagnostic criteria. The present study aims to address these gaps in the literature by employing a nationally representative sample that includes participants who meet DSM-5 diagnostic criteria for PTSD. Results accordingly will yield disparity estimates reflective of the overall American population and comprehensively evaluate whether any observed treatment disparities are reduced by insurance.

## II. METHODS

### Participants and Procedures

The study sample included 2,339 participants who met criteria for lifetime PTSD that enrolled in the National Epidemiologic Survey on Alcohol and Related Conditions-III (NESARC-III; N=36,309). The NESARC-III epidemiological study is a nationally representative survey approved by the National Institutes of Health and Westat Institutional Review Boards (Goldstein et al., 2016). Survey data was collected via in-person interviews from 2012-2013 from participants providing informed consent. Participant selection was conducted using multistage probability sampling (for details regarding the sampling design, see Grant et al., 2014). Participants were civilian, non-institutionalized U.S. residents over the age of 18 ( $M=43.33$ ,  $SD=15.43$ ; 71.0% female). Information regarding a participant's self-identified race/ethnicity was obtained using the corresponding survey item within NESARC-III. Among participants, 56.2% of participants identified as White (non-Hispanic) 20.5% as Black (non-Hispanic), 1.8% Asian/Native Hawaiian/Other Pacific Islander (non-Hispanic), 3.3% as American Indian/Alaska Native (non-Hispanic), and 18.2% as Hispanic and any race. 79.5% of the sample had public or private insurance coverage in the last 12 months.

### Measures and Instruments

#### *Lifetime PTSD*

Participants were screened for lifetime PTSD using the National Institute on Alcohol Abuse and Alcoholism Alcohol Use Disorder and Associated Disabilities Interview Schedule-5 (AUDADIS-5; Grant et al., 2014). The AUDADIS-5 is a semistructured interview for DSM-5 diagnostic criteria for mental disorders, including

PTSD. Reliabilities of past year and prior to past year diagnosis of posttraumatic stress disorder are fair ( $\kappa=.41 - .44$ ), (Grant et al., 2015). A lifetime diagnosis was determined using interview items confirming past year and prior to past year experience of psychopathology. Participants who met criteria for lifetime diagnosis were coded as having lifetime PTSD, and participants not meeting these criteria were omitted from the present analyses.

### ***Treatment Utilization***

Utilization of treatment was assessed in two categories; PTSD-focused psychotherapy and any mental health treatment. PTSD-focused psychotherapy included PTSD-specific psychotherapy provided by a clinician, and it was coded as affirmative if the participant responded “yes” to receiving outpatient psychotherapy for PTSD. Any mental health treatment was assessed using a composite of treatment receipt across multiple mental health conditions (including PTSD, depression, dysthymia, bipolar disorder, agoraphobia, social anxiety disorder, specific phobia, panic disorder, and generalized anxiety disorder). Receipt of any mental health treatment was coded as affirmative if the participant responded “yes” to receiving at least one type of treatment which included self-help, outpatient psychotherapy, inpatient, ER, and medication. A composite of treatment utilization was used to account for high prevalence of multiple comorbidities with PTSD (Goldstein et al., 2016), and including treatment for PTSD alone would severely underestimate actual care received.

### ***Insurance***

Insurance coverage was assessed using a composite of participant responses to insurance-related survey items. The present study included Medicare, Medicaid, military

healthcare, and private insurance. Insurance coverage was coded as affirmative if the participant responded “yes” to having at least one of the included insurance types.

### ***Income and Education***

Income and education were included as covariates within models and were coded using deviation effect coding, allowing comparison of deviations from the grand mean. Income was defined as the participants total household income and consisted of several income brackets, including less than \$20,000, \$20,000 to \$34,999, \$35,000 to \$49,000, \$50,000 to \$79,999, and \$80,000 to \$100,000. Income of greater than \$100,000 was assigned as the group never compared to. Education was defined as participants’ highest level of education from 1 out of 5 categories, including less than a high school degree, high school diploma/GED, some college, associate/technical 2-year degree, and bachelors. Education of a master’s degree or higher was assigned as the group never compared to.

### **Data Analysis**

Two series of hierarchical logistic regression models were employed to assess the likelihood of treatment utilization. In the first series of hierarchical logistic regression models, the observed outcome was the likelihood of receiving PTSD-focused psychotherapy. In the second series of models, the assessed outcome was the likelihood of receiving any type of treatment for a mental health disorder. Both sets of logistic regression models consisted of a base model with two nested models. The first base model included income and education. The second model added race/ethnicity, in order to evaluate variance explained in treatment utilization above and beyond income and education. The third model added insurance and interactions between insurance and

race/ethnicity. In the case of significant interaction terms, a follow-up simple slopes analysis (Aiken & West, 1991) was conducted to investigate the directionality of the relationship. Deviation coding was used for income and education, while dummy coding was used for race/ethnicity and insurance.

To evaluate effect size magnitudes, anchors provided by Cohen (1988) were employed. For overall model effect sizes,  $R^2$  values of .01, .09, and .25 corresponded to small, medium, and large effect sizes respectively. For individual coefficients, conversion formulae provided by Borenstein et al. (2021) to convert from Cohen's  $d$  to odds ratios. Small, medium, and large effect sizes respectively corresponded to odds ratios of 1.44, 2.48, and 4.27 for odds ratio increases, and 0.70, 0.40, and 0.23 for odds ratio decreases. To compare overall models, scaled corrected chi-square difference tests were conducted to compare model fit differences between sequential models in each series. All model differences and coefficient-based hypothesis tests were evaluated at the  $p < 0.05$  level. Complex sampling design variables, including AUDADIS full-sample weight, primary sampling unit, and stratum, were used in all models to account for multistage probability sampling and ensured results were reflective of the United States population.



### III. RESULTS

#### PTSD Focused Psychotherapy

53.5% of the sample utilized PTSD-focused psychotherapy. Fit of the base model was significant ( $R^2=0.05$ ) indicating that income and education accounted for 5% variance in utilization of PTSD-focused psychotherapy. Adding race/ethnicity in a second model significantly improved model fit ( $\Delta R^2=0.02$ ; overall model  $R^2=0.07$ ), indicating race/ethnicity accounted for 2% variance beyond the base model. Adding insurance and interaction variables in a third model further improved model fit ( $\Delta R^2=0.02$ ; overall model  $R^2=0.09$ ), indicating these variables accounted for 2% variance beyond the model including race/ethnicity, income, and education. Results from this third model are referenced in Table 1.

Coefficients from the survey-weighted logistic regression indicated a main effect that participants identifying as Black, non-Hispanic were significantly less likely to utilize PTSD-focused psychotherapy ( $B=-1.04$ ,  $p=0.001$ ,  $OR=0.35$ ). Further, participants identifying as American Indian/Alaska Native were significantly more likely to utilize PTSD-focused psychotherapy ( $B=1.59$ ,  $p=0.037$ ,  $OR=4.90$ ). Other main effects of race/ethnicity were nonsignificant. A main effect of insurance was significant such that insured individuals were more likely to utilize PTSD-focused psychotherapy ( $B=0.71$ ,  $p<0.001$ ,  $OR=2.03$ ). The likelihood of Black participants to utilize PTSD-focused psychotherapy was not significantly moderated by insurance ( $B=0.58$ ,  $p=0.115$ ). However, the likelihood of American Indian/Alaska Native participants to utilize this treatment was significantly modified by insurance ( $B=-1.91$ ,  $p=0.021$ ). A follow-up simple slopes analysis revealed that uninsured American Indian/Alaska Native

participants were more likely to seek treatment compared to uninsured White participants ( $B=1.59, p=0.037, OR=4.89$ ). Though, insured American Indian/Alaska Native participants were not significantly more or less likely to utilize treatment compared to insured White participants ( $B=-0.32, p=0.367, OR=0.73$ ). No other significant interaction effects were recorded for Asian/Native Hawaiian/Pacific Islander and Hispanic participant groups.

### **Any Mental Health Treatment**

Roughly 80.7% of the sample utilized any mental health treatment. Fit of the base model was significant ( $R^2=0.04$ ), indicating income and education accounted for 4% variance in utilization of any mental health treatment. Including race/ethnicity in a second model significantly improved model fit ( $\Delta R^2=0.03$ ; overall model  $R^2=0.07$ ), indicating race/ethnicity accounted for 3% variance in utilization of any mental health treatment beyond the base model. Adding insurance and interaction variables in a third model further improved model fit ( $\Delta R^2=0.14$ ; overall model  $R^2=0.22$ ), indicating these variables accounted for 14% variance beyond the model including race/ethnicity, income, and education. Results from this third model are referenced in Table 2.

Results indicated that participants identifying as Black were significantly less likely to utilize any mental health treatment ( $B=-1.14, p=0.001, OR=0.32$ ). Additionally, participants identifying as American Indian/Alaska Native were significantly more likely to utilize any mental health treatment ( $B=9.69, p<0.001, OR>20$ ). Other main effects of race/ethnicity were nonsignificant. Insured individuals were more likely to utilize treatment ( $B=0.59, p=0.038, OR=1.80$ ). Though the likelihood of Black participants to utilize any treatment was not significantly moderated by insurance status ( $B=0.64,$

$p=0.156$ ), the likelihood that American Indian/Alaska Native participants utilized any treatment was ( $B=-9.51, p<0.001$ ). As revealed in a follow-up simple slopes analysis, uninsured American Indian/Alaska Native participants were more likely to seek treatment compared to uninsured White participants ( $B=9.69, p<0.001, OR>20$ ), while insured American Indian/Alaska Native participants were not significantly more or less likely to utilize treatment ( $B=0.18, p=0.681, OR=1.20$ ). No other significant interaction effects were recorded for Asian/Native Hawaiian/Pacific Islander and Hispanic participant groups.

#### IV. DISCUSSION

The findings of the present study found several significant main and interaction effects above and beyond overall income and education. Black participants' odds for receiving treatment were about 65% less than uninsured White participants, regardless of insurance status or whether treatment was PTSD-specific or not. On the other hand, uninsured American Indian/Alaska Native participants had more than 4 times the odds of receiving treatment compared to uninsured White participants. Beyond income and education, insurance continued to have a small-to-medium sized effect on likelihood of treatment receipt across all groups, which only showed significant moderation in the aforementioned case for American Indian/Alaska Native participants.

The disparity in treatment receipt for Black participants is consistent with other findings, where the overall rates at which Black Americans access trauma-focused care and professional mental health services remain low (Davis et al., 2008; Jackson et al., 2011) despite Black populations having one of the highest prevalence rates of PTSD (Roberts et al. 2011; Alegria et al., 2013). In particular, research has shown increasing disparity over time in access to mental health care for Black and Hispanic populations (Cook et al., 2017). Other studies have found that when Black patients do seek mental health services, they more often will reach out to primary care providers than mental health providers and have fewer sessions which can drastically affect the quality of care received (Snowden & Pingitore, 2002; Lasser et al., 2002; Kearney et al., 2005).

Possible reasons for this lack of treatment utilization may stem from stigma and lack of trust in the mental health system associated with historical injustices in care provision, including observations that Black patients with symptoms of a mental illness

are more likely to be involuntarily admitted into hospitals with extended duration (McKenzie & Bhui, 2007). Black individuals are also more likely to face structural barriers to mental health care such as transportation issues, lack of time, and lack of sufficient information about where to seek care (Alang, 2015). Further, Black individuals who have experienced trauma endorse greater avoidance coping (Weiss et al., 2016) and are less likely to disclose trauma (Jacques-Tiura et al., 2010) which are factors that delay treatment. These findings emphasize the necessity for improved treatment outreach and resources that can ameliorate these specific barriers to treatment. In past, such approaches have included individual-level reeducation, implementing cultural competence training and educational sessions to increase understanding of different cultural groups. However, success of such procedures has been limited (Wyszewianski & Green, 2000). Instead, the dismantling racism model considers complexity of the issue and asserts a systems change approach to identifying racial inequities at each level of healthcare service (Griffith et al., 2007). These approaches are predominately applied in medical healthcare services, and future research may evaluate effectiveness of these methods in mental health care settings.

Further, findings reflect that insurance coverage had an overall positive association with treatment utilization for all racial/ethnic groups. This is not surprising as insurance, whether public or private, acts as a valuable means to care. Though it is important to consider the inequalities that exist in insurance coverage, as data from the U.S. Census Bureau (2021) reveals that ethnic minority groups are less likely to be insured, with Hispanic populations having the highest uninsured rates. As such, though insurance is a key advantage to accessing care, variable rates of those insured hinder

actual care received. Additionally, though individuals may be insured, some evidence suggests that type of insurance can determine whether an individual is denied care, specifically if the individual has Medicaid (Wiznia et al., 2017). This suggests that insurance type may pose as an additional barrier to treatment utilization. However, further research is needed to ascertain whether type of insurance affects likelihood of care receipt.

In comparison, a nuance in this relationship was found with a significant moderation effect of insurance on the likelihood for treatment utilization for American Indian/Alaska Native participants, such that those not insured were more likely to have utilized clinician-provided psychotherapy for PTSD, as well as any mental health treatment. This finding mirrors evidence from Emerson et al. (2019) finding that American Indian/Alaska Native participants meeting criteria for AUD were more likely to seek AUD treatment compared to White participants. These findings may be indicative of possible protective factors that stem from available community resources specific to American Indian/Alaska Native communities, such as services provided by the Indian Health Service (IHS). These services include IHS-affiliated hospitals, health centers, and behavioral health facilities located on or near reservations, and the purchase/referred care (PRC) program which improves care accessibility by purchasing services from private health care providers in limited situations.

However, further evidence suggests that these resources are not a cure-all for addressing racial/ethnic disparities. Although the federal government makes efforts to provide accessible health care for American Indian/Alaska Native patients through supporting IHS-and tribe-managed facilities, these services can vary widely and be

limited due to chronic inadequate funding (Kheptal et al., 2022; Zuckerman et al., 2022). Additional challenges are associated with the transitioning of services from federal to Tribal control, and a need for services to be culturally sensitive (Kruse et al., 2022). Further, Jaramillo and Willging (2021) evidenced additional barriers to care in American Indian populations that include long wait times and high provider turnover at healthcare facilities, worry about future programs for American Indian patients, and associated costs and complexity of health insurance plans. Similar barriers to care are seen in mental health services provided by the VA, where veterans have expressed concern with slow clinic response, lack of available providers, navigating use of their benefits, among other concerns (Cheney et al., 2018). Altogether, data suggest that centralized care services can provide substantial value and also require continued refinement.

Although Hispanic and Asian/Native Hawaiian/Other Pacific Islander groups did not differ significantly in treatment utilization in the present study, other literature has evidenced that these groups do experience lower likelihood of treatment receipt. For example, Hispanic populations are less likely to receive any psychotherapy (Spoont et al., 2017) and Black and Hispanic populations with PTSD have shown greater number and severity of symptoms compared to White populations (Alcantara et al., 2013; Kaczurkin et al., 2016). In a Latino and Asian sample (Bauer et al., 2010), individuals with limited English proficiency were less likely to identify need for mental health care and used fewer mental health care services. Asian-American patients are also less likely to utilize any type of mental health service compared to the general population (Abe-Kim et al., 2007; Kam et al., 2019). Though this relationship varied by nativity and generation statuses such that third- and later-generation Asian-American participants had higher

rates of mental health care utilization. Factors such as stigma, discrimination, and acculturation have been found to have influence on racial/ethnic differences in PTSD symptoms and treatment course (Asnaani & Hall-Clark, 2017), though research is limited. While we found odds ratios that reflected a potential for notable effects in these populations, substantial variance observed may have prevented detection of significant findings.

The present findings must be interpreted in the context of several notable limitations. First, this study relied on self-report data from an adult, civilian sample. This may introduce self-selection bias and instabilities in respondent self-appraisal, which may explain the lower reliability of the resulting PTSD diagnoses (Grant et al., 2015). Second, the overall sample contained unequal subgroup sizes. This could impact ability to detect significant effects through inflated standard errors. A third limitation was that while overall model effects were statistically significant, some of the models had modest  $R^2$  values (Cohen, 1998). Although race/ethnicity and insurance are important factors, they are not exclusive predictors of treatment utilization, and inclusion of additional variables, such as severity of symptoms, and research approaches will be needed to further improve explanation of treatment utilization rates. Next, the present study focused solely on treatment receipt. While a group may be more or less likely to utilize treatment, treatment quality can vary widely, and it is possible that the treatment itself is unsuitable for the specific needs of a distinct racial/ethnic group. Lastly, we are unable to fully disentangle the effects of race/ethnicity and insurance from the broad factors of income and education levels. While we included income and education as covariates, and as a result found incremental variance accounted for by demographic and insurance status beyond these



variables, fully causal inference is prevented by the observational nature of the NESARC-III data.

Taken together, our findings inform future approaches to improving PTSD treatment access for diverse sociocultural groups. Overall, health insurance was consistently associated with increased rates of treatment receipt across demographic groups, and centralized healthcare services available to American Indian/Alaska Native patients may serve as a model for reducing disparities in particular. Developing similar resources for Black and other underrepresented demographic groups can address the persistent disparities in treatment utilization for these groups, which exist above and beyond overall income and education factors.

**Table 1.**

*Model results using race/ethnicity and insurance status to predict receipt of PTSD-focused psychotherapy.*

Variable	B	SE	<i>p</i>	OR
Black	-1.04	0.31	0.001	0.35
AIAN	1.59	0.76	0.037	4.90
ANHPI	-0.49	0.73	0.515	0.61
Hispanic	0.05	0.26	0.847	1.05
Insurance	0.71	0.19	<0.001	2.03
Black*Insurance	0.58	0.37	0.115	1.78
AIAN*Insurance	-1.91	0.83	0.021	0.15
ANHPI*Insurance	-0.91	0.83	0.269	0.40
Hispanic*Insurance	-0.06	0.29	0.056	0.95
Simple Slopes Analysis				
AIAN, Uninsured	1.59	0.76	0.037	4.89
AIAN, Insured	-0.32	0.35	0.367	0.73

*Note. AIAN=American Indian/Alaska Native; ANHPI=Asian/Native Hawaiian/Other Pacific Islander; SE=standard error; OR=odds ratio; all model coefficients reflect models where income and education were included as covariates.*

**Table 2.**

*Model results using race/ethnicity and insurance status to predict receipt of any mental health treatment.*

Variable	B	SE	<i>p</i>	OR
Black	-1.14	0.35	0.001	0.32
AIAN	9.69	0.40	<0.001	>20
ANHPI	0.71	1.28	0.579	2.03
Hispanic	-0.39	0.33	0.247	0.68
Insurance	0.59	0.28	0.038	1.80
Black*Insurance	0.64	0.45	0.156	1.89
AIAN*Insurance	-9.51	0.64	<0.001	<0.01
ANHPI*Insurance	-2.50	1.37	0.068	0.08
Hispanic*Insurance	-0.01	0.42	0.981	0.99
Simple Slopes Analysis				
AIAN, Uninsured	9.69	0.40	<0.001	>20
AIAN, Insured	0.18	0.44	0.681	1.20

*Note. AIAN=American Indian/Alaska Native; ANHPI=Asian/Native Hawaiian/Other Pacific Islander; SE=standard error; OR=odds ratio; all model coefficients reflect models where income and education were included as covariates.*

## REFERENCES

- Abe-Kim, J., Takeuchi, D. T., Hong, S., Zane, N., Sue, S., Spencer, M. S., Appel, H., Nicdao, E., & Alegría, M. (2007). Use of mental health–related services among immigrant and US-born Asian Americans: Results from the National Latino and Asian American study. *American Journal of Public Health, 97*, 91-98.  
<https://doi.org/10.2105/AJPH.2006.098541>.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Sage.
- Alang, S. M. (2015). Sociodemographic disparities associated with perceived causes of unmet need for mental health care. *Psychiatric Rehabilitation Journal, 38*, 293-299. <https://doi.org/10.1037/prj0000113>.
- Alcántara, C., Casement, M. D., & Lewis-Fernandez, R. (2013). Conditional risk for PTSD among Latinos: A systematic review of racial/ethnic differences and sociocultural explanations. *Clinical Psychology Review, 33*, 107-119.  
<https://doi.org/10.1016/j.cpr.2012.10.005>.
- Alegría, M., Fortuna, L. R., Lin, J. Y., Norris, L. F., Gao, S., Takeuchi, D. T., Jackson, J. S., Shrout, P. E., & Valentine, A. (2013). Prevalence, risk, and correlates of posttraumatic stress disorder across ethnic and racial minority groups in the US. *Medical Care, 51*, 1114. <https://doi.org/10.1097/MLR.0000000000000007>.
- Asnaani, A., & Hall-Clark, B. (2017). Recent developments in understanding ethnocultural and race differences in trauma exposure and PTSD. *Current Opinion in Psychology, 14*, 96-101. <https://doi.org/10.1016/j.copsyc.2016.12.005>.

- Bassett, D., Buchwald, D., & Manson, S. (2014). Posttraumatic stress disorder and symptoms among American Indians and Alaska Natives: A review of the literature. *Social Psychiatry and Psychiatric Epidemiology*, 49, 417-433. <https://doi.org/10.1007/s00127-013-0759-y>.
- Bauer, A. M., Chen, C. N., & Alegría, M. (2010). English language proficiency and mental health service use among Latino and Asian Americans with mental disorders. *Medical Care*, 48, 1097. <https://doi.org/10.1097/MLR.0b013e3181f80749>.
- Borenstein, M., Hedges, L. V., Higgins, J. P., & Rothstein, H. R. (2021). *Introduction to meta-analysis*. John Wiley & Sons.
- Cheney, A. M., Koenig, C. J., Miller, C. J., Zamora, K., Wright, P., Stanley, R., Fortney, J., Burgess, J. F., & Pyne, J. M. (2018). Veteran-centered barriers to VA mental healthcare services use. *BMC Health Services Research*, 18, 1-14. <https://doi.org/10.1186/s12913-018-3346-9>.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Academic Press.
- Cook, B. L., Trinh, N. H., Li, Z., Hou, S. S. Y., & Progovac, A. M. (2017). Trends in racial-ethnic disparities in access to mental health care, 2004–2012. *Psychiatric Services*, 68, 9-16. <https://doi.org/10.1176/appi.ps.201500453>.
- Davis, R. G., Ressler, K. J., Schwartz, A. C., Stephens, K. J., & Bradley, R. G. (2008). Treatment barriers for low-income, urban African Americans with undiagnosed posttraumatic stress disorder. *Journal of Traumatic Stress*, 21, 218–222. <https://doi.org/10.1002/jts.20313>.

- Diala, C., Muntaner, C., Walrath, C., Nickerson, K. J., LaVeist, T. A., & Leaf, P. J., (2000). Racial differences in attitudes toward professional mental health care and in the use of services. *American Journal of Orthopsychiatry*, 70, 455–464. <https://doi.org/10.1037/h0087736>.
- Edlund, M. J., Booth, B. M., & Han, X. (2012). Who seeks care where? Utilization of mental health and substance use disorder treatment in two national samples of individuals with alcohol use disorders. *Journal of Studies on Alcohol and Drugs*, 73, 635-646. <https://doi.org/10.15288/jsad.2012.73.635>.
- Emerson, M. A., Moore, R. S., & Caetano, R. (2019). Correlates of alcohol-related treatment among American Indians and Alaska Natives with lifetime alcohol use disorder. *Alcoholism: Clinical and Experimental Research*, 43, 115-122. <https://doi.org/10.1111/acer.13907>.
- Goldberg, S. B., Fortney, J. C., Chen, J. A., Young, B. A., Lehavot, K., & Simpson, T. L. (2020). Military service and military health care coverage are associated with reduced racial disparities in time to mental health treatment initiation. *Administration and Policy in Mental Health and Mental Health Services Research*, 47, 555-568. <https://doi.org/10.1007/s10488-020-01017-2>.
- Goldstein, R. B., Smith, S. M., Chou, S. P., Saha, T. D., Jung, J., Zhang, H., Pickering, R. P., Ruan, W. J., Huang, B., & Grant, B. F. (2016). The epidemiology of DSM-5 posttraumatic stress disorder in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions-III. *Social Psychiatry and Psychiatric Epidemiology*, 51, 1137-1148. <https://doi.org/10.1007/s00127-016-1208-5>.

- Grant, B. F., Chu, A., Sigman, R., Amsbary, M., Kali, J., Sugawara, Y., Jiao, R., Ren, W., & Goldstein, R. (2014). Source and accuracy statement: National Epidemiologic Survey on Alcohol and Related Conditions-III (NESARC-III). *Rockville, MD: National Institute on Alcohol Abuse and Alcoholism*, 1-125.
- Grant, B. F., Goldstein, R. B., Smith, S. M., Jung, J., Zhang, H., Chou, S. P., Pickering, R. P., Ruan, W. J., Huang, B., Saha, T. D., Aivadyan, C., Greenstein, E., & Hasin, D. S. (2015). The Alcohol Use Disorder and Associated Disabilities Interview Schedule-5 (AUDADIS-5): Reliability of substance use and psychiatric disorder modules in a general population sample. *Drug and Alcohol Dependence*, 148, 27-33.
- Griffith, D. M., Mason, M., Yonas, M. Eng, E., Jeffries., V., Plihcik, S., & Parks, B. (2007). Dismantling institutional racism: Theory and action. *American Journal of Community Psychology*, 39, 381–392. <https://doi.org/10.1007/s10464-007-9117-0>
- Haagen, J. F., Smid, G. E., Knipscheer, J. W., & Kleber, R. J. (2015). The efficacy of recommended treatments for veterans with PTSD: A metaregression analysis. *Clinical Psychology Review*, 40, 184-194. <https://doi.org/10.1016/j.cpr.2015.06.008>.
- Hale, A. C., Sripada, R. K., & Bohnert, K. M. (2018). Past-year treatment utilization among individuals meeting DSM-5 PTSD criteria: Results from a nationally representative sample. *Psychiatric Services*, 69, 341-344. <https://doi.org/10.1176/appi.ps.201700021>.

- Jackson, J. S., Neighbors, H. W., Torres, M., Martin, L. A., Williams, D. R., & Baser, R. (2007). Use of mental health services and subjective satisfaction with treatment among Black Caribbean immigrants: Results from the National Survey of American Life. *American Journal of Public Health*, 97, 60-67. <https://doi.org/10.2105/AJPH.2006.088500>.
- Jacques-Tiura, A. J., Tkatch, R., Abbey, A., & Wegner, R. (2010). Disclosure of sexual assault: Characteristics and implications for posttraumatic stress symptoms among African American and Caucasian survivors. *Journal of Trauma & Dissociation*, 11, 174-192. <https://doi.org/10.1080/15299730903502938>.
- Jaramillo, E. T., & Willging, C. E. (2021). Producing insecurity: Healthcare access, health insurance, and wellbeing among American Indian elders. *Social Science & Medicine*, 268, 113384. <https://doi.org/10.1016/j.socscimed.2020.113384>.
- Kaczurkin, A. N., Asnaani, A., Hall-Clark, B., Peterson, A. L., Yarvis, J. S., Foa, E. B., & STRONG STAR Consortium (2016). Ethnic and racial differences in clinically relevant symptoms in active duty military personnel with posttraumatic stress disorder. *Journal of Anxiety Disorders*, 43, 90-98. <https://doi.org/10.1016/j.janxdis.2016.09.004>.
- Kam, B., Mendoza, H., & Masuda, A. (2019). Mental health help-seeking experience and attitudes in Latina/o American, Asian American, Black American, and White American college students. *International Journal for the Advancement of Counselling*, 41, 492–508. <https://doi.org/10.1007/s10447-018-9365-8>.



- Kearney, L. K., Draper, M., & Barón, A. (2005). Counseling utilization by ethnic minority college students. *Cultural Diversity and Ethnic Minority Psychology, 11*, 272–285. <https://doi.org/10.1037/1099-9809.11.3.272>.
- Khetpal, V., Roosevelt Jr., J., & Adashi, E. Y. (2022). A Federal Indian Health Insurance Plan: Fulfilling a solemn obligation to American Indians and Alaska Natives in the United States. *Preventive Medicine Reports, 25*, 101669.
- Kruse, G., Lopez-Carmen, V. A., Jensen, A., Hardie, L., & Sequist, T. D. (2022). The Indian Health Service and American Indian/Alaska Native Health Outcomes. *Annual Review of Public Health, 43*.
- Lasser, K. E., Himmelstein, D. U., Woolhandler, S. J., McCormick, D., & Bor, D. H. (2002). Do minorities in the United States receive fewer mental health services than Whites?. *International Journal of Health Services, 32*, 567-578. <https://doi.org/10.2190/UEXW-RARL-U46V-FU4P>.
- Masuda, A., Anderson, P. L., Twohig, M. P., Feinstein, A. B., Chou, Y. Y., Wendell, J. W., & Stormo, A. R. (2009). Help-seeking experiences and attitudes among African American, Asian American, and European American college students. *International Journal for the Advancement of Counselling, 31*, 168-180. <https://doi.org/10.1007/s10447-009-9076-2>.
- Masuda, A., Anderson, P. L., & Edmonds, J. (2012). Help-seeking attitudes, mental health stigma, and self-concealment among African American college students. *Journal of Black Studies, 43*, 773-786. <https://doi.org/10.1177/0021934712445806>.

- McKenzie, K., & Bhui, K. (2007). Institutional racism in mental health care. *BMJ*, 334, 649. <https://doi.org/10.1136/bmj.39163.395972.80>.
- Penner, L. A., Albrecht, T. L., Coleman, D. K., & Norton, W. E. (2007). Interpersonal perspectives on Black–White health disparities: Social policy implications. *Social Issues and Policy Review*, 1, 63-98.
- Pietrzak, R. H., Goldstein, R. B., Southwick, S. M., & Grant, B. F. (2011). Prevalence and Axis I comorbidity of full and partial posttraumatic stress disorder in the United States: Results from Wave 2 of the National Epidemiologic Survey on Alcohol and Related Condition. *Journal of Anxiety Disorders*, 25, 456-465. <https://doi.org/10.1016/j.janxdis.2010.11.010>.
- Roberts, A. L., Gilman, S. E., Breslau, J., Breslau, N., & Koenen, K. C. (2011). Race/ethnic differences in exposure to traumatic events, development of post-traumatic stress disorder, and treatment-seeking for post-traumatic stress disorder in the United States. *Psychological Medicine*, 41, 71. <https://doi.org/10.1017/S0033291710000401>.
- Spoont, M. R., Hodges, J., Murdoch, M., & Nugent, S. (2009). Race and ethnicity as factors in mental health service use among veterans with PTSD. *Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies*, 22, 648-653. <https://doi.org/10.1002/jts.20470>.
- Spoont, M. R., Sayer, N. A., Kehle-Forbes, S. M., Meis, L. A., & Nelson, D. B. (2017). A prospective study of racial and ethnic variation in VA psychotherapy services for PTSD. *Psychiatric Services*, 68, 231-237. <https://doi.org/10.1176/appi.ps.201600086>.

- Snowden, L. R., & Pingitore, D. (2002). Frequency and scope of mental health service delivery to African Americans in primary care. *Mental Health Services Research*, 4, 123-130. <https://doi.org/10.1023/A:1019709728333>.
- Stephens, K. A., Sue, S., Roy-Byrne, P., Unützer, J., Wang, J., Rivara, F. P., Jurkovich, G. J., & Zatzick, D. F. (2010). Ethnoracial variations in acute PTSD symptoms among hospitalized survivors of traumatic injury. *Journal of Traumatic Stress*, 23, 384-392. <https://doi.org/10.1002/jts.20534>.
- U.S. Census Bureau (2021). Health insurance coverage in the United States: 2020. <https://www.census.gov/content/dam/Census/library/publications/2021/demo/p60-274.pdf> (accessed 13 October 2021).
- Walker, E. R., Cummings, J. R., Hockenberry, J. M., & Druss, B. G. (2015). Insurance status, use of mental health services, and unmet need for mental health care in the United States. *Psychiatric Services*, 66, 578-584. <https://doi.org/10.1176/appi.ps.201400248>.
- Wang, P. S., Lane, M., Olfson, M., Pincus, H. A., Wells, K. B., & Kessler, R. C. (2005). Twelve-month use of mental health services in the United States: Results from the National Comorbidity Survey Replication. *Archives of General Psychiatry*, 62, 629-640. <https://doi.org/10.1001/archpsyc.62.6.629>.
- Weiss, N. H., Johnson, C. D., Contractor, A., Peasant, C., Swan, S. C., Sullivan, T. P. (2017). Racial/ethnic differences moderate associations of coping strategies and posttraumatic stress disorder symptom clusters among women experiencing partner violence: A multigroup path analysis. *Anxiety, Stress, & Coping*, 30, 347-363. <http://dx.doi.org/10.1080/10615806.2016.1228900>.

- Whaley, A. L. (2001). Cultural mistrust and mental health services for African Americans: A review and meta-analysis. *The Counseling Psychologist, 29*, 513-531. <https://doi.org/10.1177/0011000001294003>.
- Wiznia, D. H., Maisano, J., Kim, C. Y., Zaki, T., Lee, H. B., & Leslie, M. P. (2017). The effect of insurance type on trauma patient access to psychiatric care under the Affordable Care Act. *General Hospital Psychiatry, 45*, 19-24. <https://doi.org/10.1016/j.genhosppsych.2016.12.006>.
- Wyszewianski, L., & Green, L. A. (2000). Strategies for changing clinicians' practice patterns. *Journal of Family Practice, 49*(5), 461-461.
- Zuckerman, S., Haley, J., Roubideaux, Y., & Lillie-Blanton, M. (2004). Health service access, use, and insurance coverage among American Indians/Alaska Natives and Whites: What role does the Indian Health Service play?. *American Journal of Public Health, 94*, 53-59. <https://doi.org/10.2105/AJPH.94.1.53>.