Racial differences in posttraumatic stress disorder symptoms among African American and Caucasian male veterans

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Abstract

Objective—Posttraumatic stress disorder (PTSD) is one of the most prevalent mental health diagnoses for veterans. Previous research as well as the minority stress model and transgenerational trauma theories, suggest that race may be associated with PTSD, particularly in veterans. The current study examined whether there were racial differences in symptomology in a sample of combat veterans with PTSD (global and symptom cluster-specific).

Methods: Data were collected from male veterans who identified as non-Hispanic Caucasian or non-Hispanic African American ($N = 413$). Participants completed the Posttraumatic Stress Disorder Checklist- Military version (PCL-M). The PCL-M items were split into four symptom clusters to align with the DSM-5: Re-experiencing, Avoidance, Numbing, and Hyperarousal. It was hypothesized that African American veterans would report more severe global PTSD symptoms and higher levels of hypervigilance.

Results: Findings indicated global PTSD symptoms and three of the four symptom clusters did not differ, although the symptom cluster of Re-experiencing was found to be higher for African Americans compared to Caucasians.

Conclusions: It may be helpful for researchers to broaden their methods of assessing PTSD symptomology, such as to examine specific PTSD symptom clusters, especially when assessing differences by race.

Keywords

Posttraumatic Stress Disorder; Race; Veteran; Health Disparities; Transgenerational Trauma

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Researchers began examining the connection between race and posttraumatic stress disorder (PTSD) as early as 1980. In one of the early studies of racial differences in PTSD, Penk and colleagues (1989) found that African American veterans had significantly higher scores on a

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self-report measure of PTSD compared to either Hispanic or Caucasian veterans who experienced similar levels of combat. The authors concluded that minority status alone did not account for a higher severity of PTSD, but that African Americans may have had different life experiences compared to other minority veterans. For example, it has been argued that African American Vietnam veterans were in a unique situation when they served in combat (Frueh, Brady, & de Arellano, 1998) in that the Vietnam War was the first conflict where African American and Caucasian soldiers were integrated. This racial integration resulted in unique difficulties for racial and ethnic minority veterans (e.g., potentially serving under Caucasian officers who held racist attitudes; D'Este, 1996).

To date, the existing research examining differences in PTSD by racial grouping has reported conflicting results. Some research has found an increased risk for PTSD, higher prevalence of PTSD, or more severe PTSD symptom severity in racial minority veterans and others have found no such differences based on race (Institute of Medicine, 2012). As for African American veterans specifically, the research is also mixed. Some findings support the hypothesis that as a minority group, African Americans veterans have worse PTSD symptomology (Penk et al., 1989; Tuerk et al., 2010) compared to their Caucasian peers. However, there are noted exceptions to these racial difference in diagnosis (Baker et al., 2009) and symptomology (C'de Baca, Castillo, & Qualis, 2012; Macdonald, Greene, Torres, Frueh, & Morland, 2013; Monnier, Elhai, Frueh, Sauvageot, & Magruder, 2002).

In terms of specific symptom clusters, there remains a dearth of research examining differences based on race and ethnicity. Studies have reported that as compared to their Caucasian peers, African American veterans have reported higher levels of re-experiencing (Koo, Hebenstreit, Madden, & Maguen, 2015), hypervigilance (Ortega & Rosenheck, 2000), avoidance (Koo et al., 2015; Ortega & Rosenheck, 2000), emotional numbing (Koo et al., 2015), and guilt (Ortega & Rosenheck, 2000). Theoretically, reportedly higher levels of hyperviliance in minority veterans would make sense due to potential racial discrimination, race based trauma, or healthy cultural paranoia. However, in terms of the symptom cluster of hypervigilance, there is conflicting research, with African American's reporting higher levels in some studies (Ortega & Rosenheck, 2000) and not in others (Koo et al., 2015). Thus, additional research could aid in better understanding whether there are racial and ethnic differences based on specific symptom clusters and if so exactly why this difference exists.

Two theories were used to conceptualize the rationale for the aims, although neither theory was directly tested. The minority stress model (Meyer, 1995) and transgenerational trauma theory (Danieli, 1982; Graff, 2014) support that higher stress (in addition to trauma exposure) can lead to higher arousal, which would suggest that African Americans may report higher levels of hyperarousal symptoms of PTSD. The minority stress model helps explain the potential impacts of racism, given that the Diagnostic and Statistical Manual of Mental Disorders (DSM-5: American Psychiatric Association, 2013) defines trauma an exposure to or treat of death, serious injury, or sexual violence, and thus does not include racism as a traumatic event. Furthermore, low socioeconomic status (although a complex variable) has been linked to higher allostatic load (Johnson, Cavallaro, & Leon, 2017), while race and socioeconomic status are also linked (Williams, Priest, & Anderson, 2016) with

African Americans experiencing various disparities. Research supports that African Americans have significantly higher allostatic loads in comparison to Caucasians (e.g., Deuster, Kim-Dorner, Remaley, & Poth, 2011). These theories provide a rationale for why African American veterans specifically may be at an increased risk for PTSD, and specifically display increased hyperarousal.

A major limitation in past research is that most studies do not examine differences in symptomology based on various group characteristics such as race or ethnicity. Noted limitations of the extant literature that has examined racial differences in PTSD include the practice of coding race as a dichotomous variable (Caucasian versus not Caucasian), which then places racial minorities into one heterogeneous group (e.g., Boscarino, 2006; Boscarino, 2008). An additional limitation is a lack of controlling for relevant variables previously shown to predict PTSD which may make it difficult to draw generalizable conclusions.

The purpose of the proposed study was to examine whether there were racial differences in symptomology (overall and by symptom clusters) in a sample of veterans with PTSD while controlling for covariates. The first hypothesis was that non-Hispanic African American male veterans would report greater PTSD symptom severity compared to non-Hispanic Caucasian male veterans, after controlling for significant covariates. The second aim, to explore differences based on symptom cluster was an exploratory analysis given the current literature that exists. The second hypothesis was that non-Hispanic African American male veterans would report more severe PTSD symptoms of hyperarousal specifically (i.e., Cluster D in DSM-IV) compared to non-Hispanic Caucasian male veterans, after controlling for significant covariates.

Method

Participants

Data for a total of 515 individuals were initially gathered based on inclusion criteria for a prior study (Coleman et al., 2018). Inclusion criteria for the current study consisted of initiation in a combat-related PTSD Recovery Program in the Veterans Affairs Medical Center (VAMC) PTSD clinic, male sex, non-Hispanic Caucasian or non-Hispanic African American race, and completion of the Posttraumatic Stress Disorder Checklist- Military Version (Weathers, Huska, & Keane, 1991). After inclusion criteria were applied, a total of 413 individuals were included in the analyses.

Measures

Patient Characteristics.

Data were gathered from two sources: electronic medical records and PTSD Recovery Program evaluation data. Participant data included: participant age, sex, race, ethnicity (e.g., Hispanic or non-Hispanic), marital status, education, employment status, period of service (e.g., Vietnam era, OEF/OIF/OND), branch of service, highest enlisted rank, percent service connected for PTSD, total service connection, diagnoses (e.g., mood disorder, substance use disorder), and childhood trauma history. Data for participant diagnoses were gathered from

both the Active Problem List (i.e., list of all medical and mental health diagnoses) and from the diagnoses listed in the medical chart for the PTSD outpatient intake session.

Posttraumatic Stress Disorder Checklist-Military Version.

The Posttraumatic Stress Disorder Checklist- Military Version (PCL-M; Weathers, Huska, & Keane, 1991) was the primary measure used in the study and consists of 17 items. Respondents answer the questions based on symptoms that have occurred in the last month using a 5-point Likert scale (1 = *not at all*, 5 = *extremely*). Total scores range from 17 to 85 (higher scores indicating more severe PTSD). Symptom cluster scores were also calculated. Because the PCL-M has been shown to map onto the DSM-5 (Fissette et al, 2013; Maestas et al., 2011), the 17 items were divided based on the four DSM-5 PTSD symptom clusters (as opposed to the three symptom clusters of the DSM-IV): Re-experiencing (items 1–5), Avoidance (items 6–7), Numbing (items 8–12), and Hyperarousal (items 13–17). For the total sample Cronbach's alpha was .89; .90 for African Americans and .86 for Caucasians. Cronbach's alpha for symptom clusters ranged from .71 to .83 (Re-experiencing = .83, Avoidance = .73, Numbing = .71, and Hyperarousal = .77).

Recruitment and Procedure

The current study is based on archival data from a sample of combat veterans who participated in a PTSD Recovery group therapy program at a VAMC between the years of 2010 and 2014. The group therapy program occurred in an outpatient PTSD clinic for combat veterans. Veterans were referred to the PTSD clinic from a variety of providers within the hospital and attended an orientation before entering the clinic. After a group orientation session all veterans completed an intake session with a provider, during which they completed a PCL-M and a demographic information form. Demographic data for participants was thus gathered through chart review and data from each veteran's intake session. Clinicians determined veteran's appropriateness into the PTSD clinic based on chart review, previous diagnoses, unstructured clinical interview, and veteran's PCL-M scores and responses.

Statistical Analyses

Descriptive statistics and correlations were estimated using SPSS version 22.0. Based on prior research, the current study examined the following variables to assess whether they were covariates of PTSD symptom severity: intake: age, marital status, employment status, education, branch of service, highest enlisted military rank, period of service, childhood trauma history anxiety disorder diagnosis, mood disorder diagnosis, and substance use disorder diagnosis. In addition, exploratory analyses were conducted to test whether percent service connection, cognitive disorder, and personality disorder covaried with PTSD scores. An analysis of covariance (ANCOVA) was conducted for the first aim to evaluate whether there was a significant difference in PTSD scores based on race, controlling for significant covariates. A multivariate analysis of covariance (MANCOVA) was conducted for the second aim to evaluate whether there was a significant difference in PTSD symptom cluster scores based on race controlling for significant covariates.

Results

Descriptive Statistics

The average age of participants was 54.68 ($SD = 13.55$), with a range of 23 to 89. The majority of veterans were African American ($n = 257$, 62%), married ($n = 283$, 68%), and fit the employment status of disabled, pensioner, or retired ($n = 226$, 55%). The most common level of education was 12 years ($n = 186$, 45%). The majority of veterans either served in the Persian Gulf War ($n = 188$, 46%) or the Vietnam War ($n = 186$, 45%). Most veterans had served in the Army ($n = 295$, 71%), followed by the Marines ($n = 50$, 12%), the Air Force ($n = 20$, 5%), and the Navy ($n = 17$, 4%). The most common enlisted ranks were E-4 ($n = 127$, 31%), E-5 ($n = 85$, 21%), E-7 ($n = 49$, 12%), and E-6 ($n = 45$, 11%). Fifty-nine percent of the veterans ($n = 244$) had co-morbid mood disorders and 37% ($n = 152$) had co-morbid substance use disorders. A smaller proportion of the sample had co-morbid anxiety disorders ($n = 52$, 13%), cognitive disorders ($n = 42$, 10%), or personality disorders ($n = 4$, 1%). Nineteen percent of veterans ($n = 80$) reported a history of child abuse: emotional, ($n = 60$, 14.5%), physical ($n = 50$, 12.1%), and sexual ($n = 10$, 2.4%). The average service connection was 69% ($SD = 26.12$) and 39% for PTSD ($SD = 27.56$). See table 1 for complete listing of means and standard deviations of the PCL-M, both overall and by symptom cluster.

Covariate Testing

Veterans' age was negatively correlated with intake PCL-M total scores ($r = -.16$), suggesting that younger veterans in this sample had higher PTSD symptom severity. Unsurprisingly, the percentage of PTSD service connection was also mildly positively correlated with PCL-M total scores ($r = .16$). Total service connection, employment status, education, and highest enlisted rank were not significantly associated with PCL-M total score. Results from t-test and ANOVA covariate testing can be found in table 2. There were no statistically significant differences found in PCL-M total scores between individuals with and without childhood trauma, cognitive disorder diagnoses, and personality disorders ps $> .12$.

Racial Differences in Overall PTSD Severity

The first aim of the study was assessed using an ANCOVA to examine whether there were racial differences between African American and Caucasian male veterans in global PTSD symptoms (PCL-M total scores), after controlling for significant covariates. Before running the ANCOVA a t-test was conducted to assess racial differences without covariates. There was homogeneity of variances between racial groups, as assessed by Levene's test for equality of variances ($p = .12$). There was not a statistically significant difference in global PTSD symptoms between African American and Caucasian veterans, $t(421) = -1.46$, $p = .15$. After accounting for the covariates, there was not a statistically significant difference in total PCL-M symptom scores based on veterans' race, $F(1, 381) = .10$, $p = .75$, $\eta^2 < .001$.

Racial Differences in PTSD Symptom Clusters

The second aim of the study, which was an exploratory analysis, was assessed using MANCOVA to examine whether there were racial differences between African American and Caucasian male veterans in PTSD symptom clusters (PCL-M symptom cluster scores), after controlling for significant covariates (see Table 3). Box's test of equality of covariance matrices was used for the homogeneity of variance-covariances matrices ($p = .15$). There was homogeneity of variances, as assessed by the Levene's Test of Homogeneity of Variance, for the symptom clusters of Re-Experiencing, Avoidance, and Numbing ($p > .05$), but not for Hyperarousal ($p = .02$). Thus, because the variances for the two racial groups were not equal for Hyperarousal, a non-parametric test was chosen to assess statistical differences between groups. A Mann-Whitney U test was run to determine whether there were differences in Hyperarousal scores between African Americans and Caucasians. Distributions of the Hyperarousal scores for each racial group were similar, as assessed by visual inspection. The median Hyperarousal score was not statistically significantly different between veterans, $U = 19,365.50$, $z = -.58$, $p = .56$. After controlling for covariates, the overall MANOVA was statistically significant, $F(4, 378) = 3.78$, $p = .01$; Wilks' $\Lambda = .96$; partial $\eta2 = .04$. There was a statistically significant difference in Re-experiencing symptom scores between Caucasian and African American veterans, $F(1, 381) = 4.88$, $p = .03$; partial $\eta^2 = .01$. African American veterans had higher scores on Re-experiencing compared to Caucasians. There were no statistically significant differences in the symptom clusters of Avoidance, Numbing, or Hyperarousal, ps $>.20$.

Discussion

The purpose of the current study was to explore whether there were racial differences in PTSD symptomology (i.e., globally and between symptom clusters) among veterans with PTSD after controlling for relevant covariates. Results revealed that global PTSD symptoms were not significantly higher for non-Hispanic African American veterans compared to their Caucasian peers on a self-report measure of PTSD. Furthermore, the symptom cluster of Hyperarousal did not significantly differ based on veterans' race, rather, African American veterans reported significantly higher scores on the Re-experiencing symptom cluster compared to Caucasian veterans.

As stated previously, the existing literature on racial differences in PTSD symptoms has been mixed (Institute of Medicine, 2012). The current study may not have found racial differences in PTSD due to the limitations in the sample; such that African American veterans with worse PTSD may not have sought treatment and thus were not included in this sample. It is also plausible that our results were affected due to using a self-report measure administered by a mostly Caucasian clinical team. For example, African American patients have reported that the race of their medical provider matters clinically (Chen, Fryer, Phillips, Wilson, & Pathman, 2005; LaVeist & Carroll, 2002). It is also plausible that provider's veteran status could affect interactions.

A second explanation for the inconsistencies in research regarding racial differences in PTSD is that the relationship between PTSD symptomology and race may be highly complex and still not well enough understood to enable researchers to assess the relationship

between the two variables. PTSD is cited as the most complex mental health disorder in the DSM-5 (Brewin, 2013) with 20 different symptoms which make up four symptom clusters for a total of 636,120 heterogeneous symptom combinations (Galatzer-Levy & Bryant, 2013). Assessing the variable of race may not be sufficient to truly understand cultural and historical differences between groups of people.

The finding in this study that there were significant differences in the PTSD symptom cluster of Re-experiencing (Aim 2) is not without precedent in the literature. Koo and colleagues (2015) similarly found that African American veterans reported higher Re-experiencing symptoms compared to Caucasians. However, these authors also found that all symptom clusters except hyperarousal were higher for African American veterans. One possible explanation for racial differences in re-experiencing scores is that Caucasians may be more likely than African Americans to take medication for sleep concerns and nightmares, thus reducing their re-experiencing symptoms. Indeed, previous research suggests that African Americans are less likely than Caucasians to use medications to treat mental health concerns (Cooper et al., 2003; Han & Liu, 2005). However, because coding medication use was complex and beyond the scope of this study (e.g., some veterans in the study received medication from outside of the VAMC and thus not documented in their charts and veterans' compliance to prescriptions was not documented in charts), this explanation was not tested with these data. Another explanation for the mixed findings across studies regarding racial differences in PTSD symptom clusters is that our current understanding and measurement of PTSD may still be incomplete and/or inaccurate. Hinton and Lewis-Fernández (2011) argue that "although… differences in [PTSD] symptom expression may be found in particular [racial] groups, a consistent pattern of differences is rarely revealed" (p. 792). Thus, differences in PTSD symptom cluster definitions could account for inconsistent results across studies regarding racial group differences in symptom cluster scores.

Limitations

A major limitation of this study was in regards to the research design and sampling techniques. Veterans in this study were not randomly selected to participate; rather this study only included treatment seeking veterans. Thus, it is possible that African American veterans in this community did have higher rates of PTSD but were not engaged in treatment at the VA. Another limitation of the study was that by using only a one measures, we could not examine differences in PTSD severity based on type of measure (i.e., self-report versus clinician administered). Ideally a diagnostic interview would have been implemented at intake to help differentiate and clarify diagnoses, as well as minimize symptom over-reporting.

Furthermore, although most research examines PTSD symptomology as one variable, it may be more helpful to examine specific symptoms clusters when assessing differences by race. Future research should explore whether there are race-based differences in symptoms for other racial and ethnic minority groups, as well as in female veteran samples. Future research should continue to examine both within-group and between-group differences in PTSD symptomology with diverse participants. Perhaps the main strength of this study was

the assessment of PTSD symptoms based on symptom clusters. It would be beneficial to complete a multiple groups Confirmatory Factor Analysis with PTSD measures to more appropriately examine between group differences in symptomology. The majority of the existing literature has only focused on PTSD severity as a whole when examining racial differences. Two additional strengths of the current study were the inclusion of covariates in analyses and the examination of racial differences between two specific racial groups (versus inappropriately grouping multiple racial groups).

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Table 1

Means and Standard Deviations of Posttraumatic Stress Disorder Checklist-Military Version (PCL-M)

	Non- Hispanic African American (n = 257)		Non- Hispanic Caucasian (n = 156)		Total Sample (N = 413)		
	M	*SD*	*M*	*SD*	*M*	*SD*	**Possible Range**
Total Score	62.25	12.07	60.79	10.50	61.70	11.51	17.00–85.00
Re-experiencing	17.89	4.19	16.67	4.03	17.43	4.17	5.00–25.00
Avoidance	7.54	1.89	7.63	1.88	7.58	1.89	2.00–10.00
Numbing	16.89	4.47	16.59	4.29	16.78	4.40	5.00–25.00
Hyperarousal	19.93	4.09	19.90	3.46	19.91	3.86	5.00–25.00

Note. Factor model from Maestas, Benge, Pastorek, LeMaire, & Darrow, 2011. Symptom clusters are divided as follows: re-experiencing (items 1–5), avoidance (items 6–7), numbing (items 8–12), and hyperarousal (items 13–17).

Table 2

Independent Sample t-test and ANOVA Covariate Testing for PTSD Symptomology

	M	SD	df	t
Mental Health Diagnoses				
Anxiety Disorders	58.68	10.10		
Without Anxiety Disorder	62.14	11.67	409	2.03 [*]
Mood Disorder	63.11	11.38		
Without Mood disorder	59.25	11.34	401	3.33, $p = .001$
Substance Use Disorders	63.34	11.29		
Without Substance Use Disorder	60.75	11.56	407	2.21 [*]
	M	*SD*	*df*	*F*
Marital Status			4, 402	3.45, $p = .01$.
Divorced	63.64	11.25		
Never married	63.49	10.23		
Married	61.26	11.64		
Separated	65.38	8.59		
Widowed[a]	51.45	10.41		
Period of Service			2, 407	10.33 [***]
Persian Gulf	63.79	10.40		
Post-Vietnam	65.36	11.50		
Vietnam Era[a]	59.07	11.89		

Note.

[*]
$p < .05$,

[**]
$p < .01$,

[***]
$p < .001$.

[a]
= significantly different from other groups.

Table 3

MANCOVA Results for Posttraumatic Stress Disorder Checklist-Military Version (PCL-M) Symptom Cluster Scores at Intake

	Non-Hispanic African American		Non-Hispanic Caucasian		Between subjects		
	Adjusted M	SE	Adjusted M	SE	$F(1, 381)$	p	Partial η^2
Re-experiencing	17.79	.26	16.82	.34	4.882	.028[*]	.013
Avoidance	7.50	.12	7.75	.15	1.635	.202	.004
Numbing	16.74	.27	16.74	.35	.000	.989	.000
Hyperarousal	19.79	.24	20.13	.31	.740	.390	.002

Note. Adjusted for age, marital status, period of service, anxiety disorder diagnosis, mood disorder diagnosis, and substance use diagnosis.

[*]
$p < .05.$