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Sex Differences in Mental Health Symptoms and Substance Use and their Association with Moral Injury in Veterans

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Abstract

Objective: This study examines potential sex differences in three types of experiences (i.e., Atrocities of war, Cognitive/emotional changes from combat, and Leadership failure/betrayal) that may result in moral injury (i.e., guilt, shame, inability to forgive one's self, inability to forgive others, and withdrawn behavior associated with these three types of experiences). In addition, we examine whether moral injury results in different associations with mental health and substance use outcomes for female versus male veterans. We expected more symptoms of depression and anxiety for women and more symptoms of hazardous alcohol use and drug abuse for men. Also, we examined sex as a moderator between moral injury and outcomes, expecting stronger relationships between moral injury and symptoms of depression and anxiety among women, and stronger associations between moral injury and alcohol use and drug abuse symptoms for men.

Method—Participants ($n = 256$; 60.9% [$n = 156$] males) were a community sample of recent-era military personnel who completed a measure of MIEs and associated moral injury.

Results: After correcting for Type I error rate, sex was not associated with mental health or substance use. Further, no sex by moral injury interactions were present; however, moral injury significantly positively predicted all negative mental health symptoms (depression, anxiety, suicidality, and PTSD), and hazardous alcohol use, but not drug abuse symptoms.

Conclusions: Results reveal the need for improved screening and treatment of moral injury and integrated treatments that may assess moral injury and associated disorders.

Keywords

moral injury; gender; combat; mental health; substance use

Combat situations put military members at risk for physical and psychological harm (Godfrey et al., 2015; Hoge & Castro, 2006). Combat also places military members at risk for another type of trauma known as moral injury. Morally injurious experiences (MIEs) are events that violate one's personal beliefs (Litz et al., 2009). While many veterans are

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resilient to their wartime experiences and do not develop moral injury, other veterans are believed to develop moral injury from exposure to MIEs. For veterans who develop moral injury, it is an internal reaction (guilt, shame, etc.) from external circumstances (i.e., MIEs). In this paper, we explore whether MIEs have differential risk for moral injury for female versus male veterans, and whether moral injury results in different associations with mental health and substance use outcomes for female versus male veterans.

Although moral injury has been recognized for many years (Shay, 1994), since the drawdown of recent wars, moral injury has gained considerable attention. The attention given to moral injury may in part reflect that the nature of recent wars, which have been marked by increases in unconventional warfare, such as unmarked combatants, civilian threats, and extensive use of improvised explosive devices (IEDs; Bird & Fairweather, 2007). These tactics may increase the likelihood that veterans experienced MIEs.

The most cited model of moral injury is that proposed by Litz et al. (2009). Litz and colleagues contend that moral injury is the result of traumatic events (i.e., MIEs) that do not necessarily result in fear or impending threat to one's physical safety. MIEs include events such as engagement in or observation of betrayals (e.g., leadership failure), within-rank violence (e.g., sexual assault, friendly fire), inability to prevent injury or death to others, war-related destruction or the death of civilians or children (Drescher et al., 2011; Farnsworth, Drescher, Nieuwsma, Walser, & Currier, 2014; Litz et al., 2009). Even when sanctioned and part of one's military mission, events during combat or combat operations may lead to moral injury. For instance, a military member may have the general belief that killing is wrong but engage in sanctioned killing during combat. Thus, sanctioned or non-sanctioned MIEs may create cognitive dissonance, that is, conflict between what the military member has witnessed or engaged in and one's belief system. When veterans are unable to integrate these MIEs or their part in them into their belief system, they may develop moral injury.

Although there is no consensus regarding what constitutes moral injury, most investigators contend that guilt and shame are core symptoms of moral injury (Bryan et al., 2016; Farnsworth et al., 2014; Frankfurt & Frazier, 2016; Jinkerson, 2016; Litz et al., 2009). Other components of moral injury include difficulty with forgiveness, anger/contempt, grief/sorrow, and spiritual/existential distress (Currier, Holland, Drescher, & Foy, 2015; Frankfurt & Frazier, 2016; Jinkerson, 2016; Litz et al., 2009). When moral beliefs are breached and the veteran is not able to make meaning from these events, moral injury may develop. Over time, secondary symptoms, such as depression, PTSD, and substance use problems (Author, in press; Currier, Holland, & Malott, 2015; Held, Klassen, Brennan, & Zalta, 2018; Jinkerson, 2016; Litz et al., 2009; Maguen & Litz, 2012) may emerge from moral injury.

It is important to recognize the distinction between PTSD and moral injury. Although PTSD and moral injury are highly correlated (Battles et al., 2018), they stem from different forms of risk. Moral injury is a reaction to exposure to *moral* danger (i.e., challenges to one's ethical code), whereas PTSD is generally, but not always, a reaction to *mortal* danger (i.e., risk of physical harm; Nieuwsma et al., 2015). Of note, MIEs typically do not meet diagnostic criteria for PTSD suggesting that moral injury may be a distinct syndrome that

should be examined separately from PTSD (Drescher et al., 2011). However, it is important to realize that due to the nature of combat, one may be exposed to physical danger in the same event in which morals are challenged (e.g., killing an enemy combatant to protect oneself). In addition, consequences of both types of trauma (i.e., both moral and mortal) are often similar and may result in similar outcomes (e.g., reexperiencing, avoidance or numbing, loss of trust; Shay, 2014). Moreover, in a recent study, both moral injury and PTSD were significantly positively associated with depression, anxiety, suicidality, hazardous alcohol use, and drug abuse symptoms (Battles et al., 2018). However, when both moral injury and PTSD were included as simultaneous mediators between MIEs and these mental health symptoms, PTSD emerged as a unique mediator above and beyond moral injury, demonstrating some unique prediction despite their strong correlations.

In support of the Litz et al. model (2009), events that constitute betrayal, such as following an order that one perceives violates rules of engagement may lead to guilt and shame (Drescher et al., 2011). Similarly, witnessing or engaging in cruelty or violence toward civilians may lead to feeling one has been betrayed or betrayed their own values and result in guilt or shame. Correspondingly, guilt served to mediate the association between MIEs and depression and anxiety (Jinkerson, 2017). Further, guilt and shame were associated with more severe PTSD among Vietnam veterans (Currier, Holland, Drescher, & Foy, 2015) and more severe suicidal ideation among recent-era veterans (Bryan, Bryan, Morrow, Etienne, & Ray-Sannerud, 2014). Therefore, MIEs may be an important contributor to PTSD due to feelings of shame and guilt that stem from experiences during combat. Additionally, perceptions of the ‘wrongness’ of events contributes to anger, PTSD, depression, guilt, and shame above combat exposure alone (Lancaster & Erbes, 2017). McLean and colleagues (2017) found that among post-9/11 veterans, PTSD symptom severity was *indirectly* associated with suicidal ideation via negative cognitions regarding warzone traumas. Taken together, findings support the notion that PTSD and moral injury may be separate disorders, and that MIEs as well as moral injury may be associated with mental health outcomes.

Whether MIEs confer greater risk for female veterans, however, is not known. Alcohol abuse rates are higher among male veterans (Hoggatt et al., 2015), whereas combat has stronger associations with depression for female veterans (Luxton, Skopp, & Maguen, 2010). Further, a large sample of first-time users of the VA healthcare system who served in Iraq and Afghanistan found that male veterans were over twice as likely to be diagnosed with an alcohol and/or drug use disorder (Seal et al., 2011). However, female veterans are more likely than males to report being diagnosed with depression or anxiety (Blosnich, Brenner, & Bossarte, 2016). Results of previous studies are inconclusive as to whether combat experiences pose greater risk for the development of PTSD for female veterans. Namely, Luxton et al. (2010) found combat exposure results in greater risk for PTSD among female veterans; however, other studies reported no sex differences in the development of PTSD among combat veterans (e.g., Jacobson, Donoho, Crum-Cianflone, & Maguen, 2015; Vogt et al., 2011). Nevertheless, sex differences exist in mental health diagnoses and substance use in the larger population (Substance Abuse and Mental Health Services Administration, 2014). Further, it is possible that women and men may discern and/or may respond to MIEs differently, which may yield different mental health and substance use outcomes.

Between September 2001 and February 2013, 299,548 women were deployed (National Center for Veterans Analysis and Statistics, 2017). Thus, we examined whether MIEs, reactions of moral injury (guilt, shame, inability to forgive one's self or others, and withdrawn behavior), mental health symptoms (i.e., depression, anxiety, suicidality, and PTSD) and substance use (hazardous alcohol use, drug abuse symptoms) differed for male versus female veterans. We hypothesized that women would report higher depression and anxiety, whereas men would report more alcohol and drug abuse symptoms. Also, we expected moderation such that moral injury would have stronger associations with depression and anxiety among women, and stronger associations with hazardous alcohol use and drug abuse symptoms among men. Findings from previous studies are mixed as to whether combat confers greater risk for PTSD for female as compared to male veterans. For this reason, we included PTSD in the models; however, we did not make a specific directional hypothesis for PTSD.

Method

Participants

The sample ($N = 256$) consisted of veterans ($n = 186, 72.7\%$), National Guard/Reservists ($n = 51, 19.9\%$) and active duty members ($n = 19, 7.4\%$). Participants must have served after September 11, 2001 and have deployed to Operation Iraqi Freedom (MOIF deployments = 3.31, $SD = 1.23$) or Operation Enduring Freedom (MOEF deployments = 3.42, $SD = 1.26$). To confirm participants' service in recent era operations, participants were asked to describe their occupation while serving in the military. An experienced researcher that was a recent-era veteran examined participants' descriptions of their military occupation to confirm participants' service in the military. In total, participants who did not describe their position or participants with positions that could not be verified by the researcher (i.e., vague responses or fictitious titles) were excluded from the study. Participants were recruited from Facebook ($n = 80, 31.3\%$), listserves ($n = 48, 18.8\%$), student veteran organizations ($n = 38, 14.8\%$), a Psychology Research pool ($n = 30, 11.7\%$), and other sources (e.g., Craigslist, flyers, word of mouth; $n = 60, 23.4\%$). See Author (in press) for more details. Participants were mostly early 30s ($M = 32.69, SD = 6.97$), married ($n = 192; 75.0\%$), White ($n = 173, 67.6\%$), had attended college ($n = 237, 92.6\%$), employed full-time ($n = 179, 69.9\%$), and Army members ($n = 133, 52.0\%$). There were no significant differences between men and women demographically. In the larger post 9/11 veteran population, the average age is 35 and 34 for male and females, respectively, 57% of men and 49.2% of women are married, 76.8% and 85.7% have attended college, and 67.5% and 55.0% are White (U.S. Department of Veterans Affairs, 2018). Thus, in comparison to the larger 9/11 veteran population, our sample was comparable in terms of racial diversity, but approximately 2 years younger, and more likely to be female, married, and have attended college. After providing consent, participants completed an online survey. Non-students received a \$10 Amazon gift card; students received research credit or were entered into twenty \$20 raffles.

Materials

Morally injurious experiences.

The Moral Injury Questionnaire – Military version (MIQ-M; Currier, Holland, Drescher et al., 2015) was adapted to assess both MIEs and the reaction/core symptoms of moral injury (Author, in press). First, participants rated the frequency with which they had experienced MIEs using a 4-point scale where 1 = *Never* and 4 = *Often*. Author (in press) identified three domains of MIEs: *Atrocities of war* (“I saw the death[s] of children”, 13 items; $\alpha = .95$), *Cognitive/emotional changes from combat* (“I survived when others didn’t”, 6 items; $\alpha = .85$), and *Leadership failure/betrayal* (“Things I saw in the war left me feeling betrayed or let-down by military/political leaders”, 3 items; $\alpha = .78$), for a total of 22 MIE items. Scores were calculated to represent the mean for the items that assessed each of the MIE factors. All MIE factors had good internal consistency; MIE factors were correlated (.31 to .54) with depression, anxiety, and PTSD.

Moral injury.

Reaction to MIEs (moral injury symptomology) was also assessed using the modified MIQ-M (Currier, Holland, Drescher et al., 2015; Author, in press). To assess reaction/core symptoms of moral injury, respondents answered five follow-up questions about each MIE item: how much each MIE item caused them to: 1) “feel guilt”, 2) “feel shame”, 3) “have difficulties with forgiving myself”, 4) “have difficulties forgiving others”, and 5) “to become withdrawn”, using the same 4-point scale where 1 = *Never* and 4 = *Often*. A single moral injury score represented reaction/core symptomology across all three factors, given the strong correlations among symptomology items regardless of MIE factor (Author, in press). Up to 110 items were used for the moral injury score (i.e., 5 follow-up questions after each of 22 MIE items). However, MIEs that the participants indicated they did not experience (by endorsing *Never*) were excluded from this calculation (i.e., if a participant reported never experiencing a particular MIE, then those follow-up questions regarding guilt, shame, etc., were not included in moral injury score calculations). Thus, the moral injury score may represent a smaller number of items for each individual. Moral injury had excellent internal consistency ($\alpha = .98$); moral injury was correlated (.53 to .67) with depression, anxiety, and PTSD.

Respondents also completed assessments of PTSD, depressive symptoms, anxiety, suicidality, hazardous alcohol use, and drug abuse symptoms.

Posttraumatic stress disorder.

The 20-item PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013) assessed DSM-5 (American Psychiatric Association, 2013) symptoms of PTSD. Respondents rated past month symptom severity on a 5-point scale from 0 (*Not at all*) to 4 (*Extremely*), with a total possible score of 80 ($\alpha = .96$). A recent psychometric analysis of the PCL-5 revealed an optimal cut score of 33 with regards to DSM-5 criteria for PTSD (Wortmann et al., 2016). In the present sample, 57.7% ($n = 90$) of men and 54.0% ($n = 54$) of women, for a total of 56.3% ($n = 144$) participants scored at or above the cut-off of 33.

Depressive symptoms.

Depressive symptoms were assessed using the 10-item Center for Epidemiological Studies Depression Scale (CES-D-10; Kohout, Berkman, Evans, & Cornoni-Huntley, 1993; $\alpha = .73$). Rather than a 0 = *no*, 1 = *yes* scale, we used the CES-D's (Radloff, 1977) original 4-point scale, which ranges from 0 (*Rarely or none of the time [less than 1 day]*) to 3 (*Most or all of the time [5–7 days]*). González et al. (2017) and Cheung, Liu, and Yip (2007) have also used 4-point response codes, similar to that used in the original CESD, for the 10-item version of the CESD. Further, González et al. found a score of 8 for the 10-item CESD using this response scale corresponded to a cut-off of 16 on the original CESD. In the present sample, 87.8% ($n = 137$) of men and 82.0% ($n = 82$) of women were above a score of 8, for a total of 85.5% ($n = 219$) scoring at or above the cut-off indicating the need for additional screening.

Anxiety symptoms.

Anxiety symptoms were measured using the 14-item Kremen Anxiety Scale (KAS; Kremen, 1996) which assesses worries, apprehension, and nervousness. Similar to a study of military mothers (Kelley et al., 2002), we used a 5-point scale ranging from 1 (*Never*) to 5 (*Always*). Cronbach's alpha was .90.

Suicidality symptoms.

Suicidal symptoms were assessed with the 6-item Suicide Subscale from the Inventory of Depression and Anxiety Symptoms (IDAS) (Watson et al., 2007). Item responses range from 1 (*Not at all*) to 5 (*Extremely*). Internal consistency was excellent ($\alpha = .91$). Watson et al. (2007) demonstrated internal consistency, strong short-term stability, and good convergent and discriminant validity.

Hazardous alcohol use.

The 10-item Alcohol Use Disorder Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) was used to examine hazardous alcohol consumption and problems ($\alpha = .87$). Responses are scored from 0 to 4; higher scores indicate greater hazardous alcohol use. To provide a comparison to studies that have categorized subjects based on a cut-off score, we looked at the percentage of men and women who exceeded a total AUDIT score of 8 or higher which traditionally suggests alcohol misuse (Babor et al., 2001). In the present study, 74.4% ($n = 116$) of men and 66.0% ($n = 66$) of women met this cut-off score, for a total of 71.1% ($n = 182$) of the entire sample.

Drug abuse symptoms.

The 10-item Drug Abuse Screening Test-10 (DAST-10; Skinner, 1982) assessed drug abuse symptoms using a dichotomous response scale (1 = *yes*, 0 = *no*). For the present study, $\alpha = .72$. In a comprehensive review of the DAST 10, 20, and 28-item versions, Yudko, Lozhkina, & Fouts, (2007) found all versions yield good measures of reliability and validity and are beneficial for clinical or research use. Further, the DAST-10 correlates nearly perfectly with the DAST-20 (.97; Cocco & Carey, 1998). A score of 3 or more suggests a probable drug use disorder (Carey, Carey, & Chandra, 2003; Skinner, 1982). Using a cut-off of 3 for the DAST-10, 60.3% ($n = 94$) of male and 55.0% ($n = 55$) of female veterans in our sample

exceeded the cut-off for likely drug use disorder, for a total of 58.2% ($n = 149$) of the entire sample.

Results

Normality was confirmed as was the absence of outliers. A series of multiple regressions were conducted. Dummy coded sex (0 = *male*, 1 = *female*), mean-centered moral injury symptomology scores, and the interaction between the two were included as predictors. Separate analyses were conducted for each outcome resulting in six total regressions. A Bonferroni correction ($\alpha = .0083$ [.05/6]) adjusted for Type I family-wise error. Independent samples t tests indicated no significant sex differences on any MIE factors, moral injury, depression, anxiety, PTSD, suicidality, AUDIT, or DAST (see Table 1).

Multiple regressions (see Table 2) showed moral injury symptomology was associated with significantly poorer outcomes with squared semi-partial correlations indicating medium to large effects. Although a similar trend was observed for drug abuse symptomology, it failed to reach significance using the more conservative cutoff of $\alpha = .0083$. Sex was not associated with outcomes after controlling for moral injury symptomology, nor did it moderate the observed effects.

Discussion

Moral injury predicted negative mental health symptoms and hazardous alcohol use; sex did not moderate these associations. The nature of recent wars, which have been marked by increases in unconventional warfare, such as unmarked combatants, civilian threats, and extensive use of improvised explosive devices (IEDs), put veterans at risk for MIEs. Specifically, 98% of our sample indicated that they had experienced one or more MIEs.

Although veterans who report greater symptoms of moral injury appear at greatest risk of hazardous alcohol use, on average, men and women met the cut-off for hazardous alcohol use as determined by the elevated means listed in Table 1. Specifically, 71% of the sample exceeded the cut-off for hazardous drinking on the AUDIT (Babor et al., 2001).

Among civilian men and women, rates of alcohol use and alcohol use disorder narrowed between 2002 and 2012 (White et al., 2015). In particular, the gender gap in hazardous drinking appears to be decreasing particularly at younger ages. Further, a 2013 Institute of Medicine (IOM) report found significantly higher rates of heavy alcohol use (5 or more drinks per occasion at least once a week for men or women) among active duty personnel as compared to civilians. This finding was especially true in younger age groups (i.e., 18 to 25 and 25–36). Although our sample had relatively few active duty members (only 7.4%), our results show high rates of hazardous alcohol use among recent-era veterans. Other studies have also found high levels of alcohol use following deployment among post 9/11 veterans. For instance, using data from the Millennium Cohort Study, Reserve and National Guard women who deployed and reported combat exposures were at increased risk of new-onset for heavy weekly drinking, and men were at risk for alcohol-related problems (e.g., Jacobson et al., 2008). Among Navy personnel deployed in 2014, an increase in work stressors over the course of deployment was associated with increases in depressive

symptoms, which in turn, predicted increases in hazardous drinking from pre- to post-deployment and 6 months post-deployment (Kelley, Bravo, Hollis, 2017). Taken together, these studies suggest that both combat experiences and operational stress associated with deployments may be associated with high levels of alcohol use post-deployment for young military members.

Contrary to expectations, sex did not moderate the association between moral injury and drug abuse symptoms. Although there was a trend for moral injury to predict drug abuse symptomology, results failed to reach significance at the more stringent alpha value. Although moral injury did not significantly predict drug abuse symptoms, we should point out that over half of our sample met the cut-off for likely drug use problems (Carey et al., 2003; Skinner, 1982). The finding that so many veterans endorsed drug abuse symptoms indicative of the need for screening suggests that drug use is common among young male and female young post 9/11 veterans. This finding is especially interesting as active duty samples typically have low levels of drug use (Bray et al., 2010). The low level of drug use among active duty military members is likely to reflect the strict no tolerance policy against drug use in the military. With respect to wartime events and drug use, Held et al. (2018) found causing harm, injury, or death was associated with PTSD, drug use, and anger; however, this association was not significant when total number of lifetime traumas was entered in the multivariate analyses (Held, Boley, Karnik, Pollack, & Zalta, 2018). Likewise, Kelley et al. (found for both 2015) female and female veterans of recent wars, both combat exposure and non-combat-related trauma prior to the military were associated with drug abuse symptoms, and that depression mediated this association. In short, recent-era veterans were likely to exceed cut-offs indicating possible drug abuse problems. While there was a tendency for moral injury to predict drug abuse symptoms, clearly, other variables such as previous trauma that may contribute to drug use symptoms should be examined in future research.

Findings also revealed that none of the mental health variables (e.g., suicidality, PTSD, depression, anxiety) were significantly different for men and women. Sex differences on mental health outcomes among military personnel are mixed with some studies revealing that women are more likely than men to report symptoms of depression and anxiety (Gibbons, Hickling, Barnett, Herbig-Wall, & Watts, 2012; Hourani, Williams, Bray, & Kandel, 2015), however, other studies find no differences on mental health outcomes (e.g., Elbogen et al., 2013; Maguen, Luxton, Skopp, & Madden, 2012).

In 2013, the ban on women serving in combat was removed potentially putting women at increasing risk for combat exposure. Consistent with this shift in military policy, Kelley et al. (2013) found 92.6 % of men and 85.1% of women who took part in a post-deployment mental health survey reported exposure to combat. However, hand-to-hand combat was rare in recent wars (Afari et al., 2015). Rather, recent wars were characterized by the use of guerrilla warfare, which includes irregular warfare such as roadside IEDs, armed civilians, sniper attacks, raids, and so forth (Bird & Fairweather, 2007). In fact, over half of all casualties in Iraq and Afghanistan were due to IEDs (Shell, 2017). All of these features resulted in complex and unexpected MIEs for men and women. Thus, it is not surprising that

men and women veterans report comparable levels of mental health symptoms as the experiences of male and female veterans were much more similar than in the past

With respect to the lack of differences in MIEs and moral injury between men and women, in comparison to PTSD, which often results from threats to one's physical safety and arousal, moral injury results from a shattering of one's beliefs about larger worldview, one's relationship to a higher power, and beliefs about one's self (Litz et al., 2009). It is possible that experiences that result in an existential crisis or moral injury create a similar need to make sense of combat experiences. If this is the case, the lack of integration of one's experiences may result in similarities in post-deployment mental health and substance use outcomes.

Limitations

Several limitations should be noted. First, the current study was cross-sectional, limiting causal inferences about MIEs, moral injury, and mental health outcomes. Second, it is possible that pre-military mental health, and other variables not examined here, may be associated with moral injury, as well as later mental health and substance use. Third, a current problem in the assessment of moral injury is that causes and consequences are often confounded (see Frankfurt Frazier, 2016 for a discussion). In the present study, we assessed MIEs with a modified version of the MIQ-M that was adapted to avoid assessing causes and consequences (Author, in press). Nevertheless, factor analysis of the modified MIQ-M led to three domains, one of which, Cognitive/emotional changes from combat, conflates exposure with its consequences. Ideally, future research should further differentiate exposure from consequences, as well as incorporate longitudinal designs to explore how pre-military experiences and exposure to MIEs are associated with changes across military service. Finally, our sample is comprised of post 9/11 veterans. These results may not generalize to pre-9/11 veterans.

Clinical Implications

Results point to the importance of screening for moral injury and integrated treatment for moral injury for both men and women veterans. Also, the nature of recent wars have resulted in high likelihood of MIEs. Although some veterans may be able to integrate these experiences, many others may not. For many veterans, discussing MIEs and their part in these events, and in some instances, serious violation of rules of engagement or acts of omission may lead to withdrawal or guilt and shame and difficulty initiating treatment. Clearly, this presents challenges to the clinician to help veterans develop the trust necessary to work through these events and begin to forgive themselves (Litz et al., 2009). A second challenge may be to look past PTSD, and so forth, to consider how moral injury may be associated with current behavior such as alcohol and drug use. Currently, moral injury may not typically be assessed by clinicians. Therefore, how moral injury and MIEs may be impacting substance use behavior and negative thoughts may be ignored if not considered separate from a diagnosis of PTSD.

Conclusions

Moral injury predicted negative mental health symptoms and hazardous alcohol use; sex did not moderate these associations. The nature of recent wars, in which both men and women veterans experienced MIEs, may be expected to result in similar levels of moral injury. Further, moral injury is associated with more negative mental health symptoms and hazardous alcohol use for both men and women.

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Clinical Impact Statement:

Reactions to violating one’s personal beliefs (i.e., moral injury) as the result of combat is common, but whether moral injury is associated with similar outcomes for male and female veterans is not known. From this study, moral injury does not appear to be associated with different mental health and substance abuse outcomes for veterans across sex.

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Table 1

Moral Injury Constructs and Mental Health Symptomology by Sex

Variable	Male (n=156)		Female (n=100)		M diff	SE diff	t	df	p
	M	SD	M	SD					
<i>MI Es Factor 1</i>	1.94	0.61	1.81	0.58	0.14	0.077	1.77	254	.078
<i>MI Es Factor 2</i>	2.18	0.63	2.05	0.56	0.13	0.077	1.64	254	.102
<i>MI Es Factor 3</i>	2.22	0.77	2.18	0.72	0.04	0.096	0.43	254	.667
<i>MI Sx</i>	2.16	0.63	2.13	0.61	0.03	0.080	0.32	250	.752
<i>Depressive Sx</i>	13.03	5.26	12.74	5.47	0.29	0.684	0.42	254	.677
<i>Anxiety Sx</i>	38.13	10.79	37.87	12.19	0.25	1.401	0.18	254	.857
<i>Suicidality</i>	14.71	6.03	13.63	5.67	1.08	0.754	1.43	254	.155
<i>PTSD</i>	36.15	18.06	34.68	17.68	1.47	2.295	0.64	254	.524
<i>AUDIT</i>	14.67	8.39	13.65	8.66	1.02	1.088	0.94	254	.348
<i>DAST</i>	3.35	2.32	3.17	2.45	0.18	0.304	0.59	254	.555

Note. MIE = Morally injurious experiences, MI Sx = Moral injury reaction/symptoms, PTSD = Post-traumatic stress disorder, AUDIT = Alcohol Use Disorders Identification Test, DAST = Drug Abuse Screening Test. Sex was dummy coded (0 = male, 1 = female).

Table 2

Multiple Regression Results Predicting Mental Health Symptomology

	β	<i>B</i>	<i>SE</i>	<i>p</i>	r_p^2
<i>Depressive Symptoms</i>					
Sex	-0.03	-0.27	0.598	.657	.001
MI Symptoms	0.46	3.95*	0.597	<.001	.132
Sex X MI Symptoms	0.06	0.80	0.969	.411	.002
<i>Anxiety Symptoms</i>					
Sex	-0.002	-0.05	1.171	.966	.000
MI Symptoms	0.56	9.85*	1.168	<.001	.196
Sex X MI Symptoms	-0.003	-0.08	1.897	.967	.000
<i>Suicidality</i>					
Sex	-0.10	-1.18	0.687	.086	.010
MI Symptoms	0.38	3.59*	0.686	<.001	.090
Sex X MI Symptoms	0.06	0.95	1.114	.394	.002
<i>PTSD Sx</i>					
Sex	-0.04	-1.42	1.651	.389	.002
MI Symptoms	0.65	18.60*	1.647	<.001	.264
Sex X MI Symptoms	0.07	3.07	2.675	.252	.003
<i>AUDIT</i>					
Sex	-0.06	-1.00	0.973	.304	.003
MI Symptoms	0.44	5.97*	0.971	<.001	.122
Sex X MI Symptoms	-0.002	-0.04	1.577	.981	.000
<i>DAST</i>					
Sex	-0.04	-0.19	0.302	.536	.002
MI Symptoms	0.20	0.76	0.302	.013	.025
Sex X MI Symptoms	-0.05	-0.28	0.490	.570	.001

Note. MI = Moral Injury, PTSD = Post-traumatic stress disorder, AUDIT = Alcohol Use Disorders Identification Test, DAST = Drug Abuse Screening Test. Sex was coded 0 = *male*, 1 = *female*. Significant findings are indicated in bold.

* $p < .0083$ (consistent with the Bonferroni correction).