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BRIEF REPORT



The associations between moral injury and suicidal thoughts and behaviors among healthcare workers

Benjamin M. Campbell , Tourna N. Khan , Sinan S. Anwar, Michael A. Knipp, and Rachel A. Hoopsick 

Department of Health and Kinesiology, University of Illinois Urbana-Champaign, Champaign, Illinois, USA

ABSTRACT

Research suggests that moral injury (i.e., perpetrating, witnessing, or failing to prevent acts that transgress one's moral beliefs, values, or ethics) is associated with a range of adverse psychological sequelae among military-connected populations, including suicidality. However, little is known about how moral injury is associated with suicidality among healthcare workers or if these associations differ by gender. We collected self-reported data from a sample of United States healthcare workers ($N=200$), including a modified Moral Injury Events Scale and items related to suicidality (i.e., past-year suicide thoughts, suicide plans, suicide attempts). We examined the cross-sectional relationships between moral injury and these measures of suicidality using separate logistic regression models and examined for differences by gender. Greater moral injury was significantly associated with higher odds of past-year suicidal thoughts ($aOR = 1.05$, 95% CI: 1.01, 1.09) and associated with suicide planning ($aOR = 1.06$, 95% CI: 1.00, 1.12) and suicide attempt at a trend-level ($aOR = 1.07$, 95% CI: 0.99, 1.16). There were no statistically significant differences in these associations by gender. Results suggest that suicidal thoughts, plans, and attempts of healthcare workers may be driven, in part, by morally injurious events experienced in the workplace.

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KEYWORDS

Moral injury; suicide; healthcare workers

Introduction

While much is known about moral injury and potentially morally injurious events (PMIEs) (i.e., perpetrating, witnessing, or failing to prevent acts that transgress one's moral beliefs, values, or ethics), most of these studies have focused on veterans and military-connected populations (e.g., Bryan et al., 2014; Houtsma et al., 2017; Maguen et al., 2023; Smigelsky et al., 2020).

CONTACT Rachel A. Hoopsick  hoopsick@illinois.edu  Department of Health and Kinesiology, College of Applied Health Sciences, University of Illinois Urbana-Champaign, 1206 S. Fourth St. 2017 Khan Annex, Huff Hall, Champaign, IL 61820, USA.

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Growing research, however, is drawing attention to moral injury in civilian populations, including healthcare workers (e.g., Campbell et al., 2024; Litam & Balkin, 2021; Riedel et al., 2022). Studies have shown that healthcare workers are at a higher risk of suicidality than the general population, both before (Awan et al., 2021; Davis et al., 2021; Hawton et al., 2011) and after the COVID-19 pandemic began (Harvey et al., 2021; Mortier et al., 2022; Padmanathan et al., 2023). The COVID-19 pandemic has impacted the mental health of healthcare professionals, emphasizing considerable stressors and PMIEs. A growing field of research shows the associations between moral injury and various internalizing and externalizing sequelae (Hegarty et al., 2022; Hines et al., 2021; Plouffe et al., 2021; Spilg et al., 2022). More research into civilian moral injury is warranted, particularly its relationship with suicidality and other externalizing outcomes.

In the context of the COVID-19 pandemic, similarities in the experiences of healthcare workers and those in active military contexts were revealed (Gardiner & Gardiner, 2020; Hall et al., 2022; Hines et al., 2021; Nieuwsma et al., 2022), most notably higher rates of depression, anxiety, and PTSD than the general population, and frequent exposure to PMIEs (Hall et al., 2022; Nieuwsma et al., 2022). Maguen et al. (2023) also showed gender-based differences in experiences of moral injury among veterans, finding that women were more likely to report being betrayed by fellow servicemembers as a main PMIE experienced, while both men and women detailed committing a PMIE. Further, they found that women had self-harming outcomes associated with witnessing a PMIE or being betrayed as a PMIE, while men showed self-harming outcomes for both of these, as well as perpetrating a morally injurious act.

Although several studies examined military-connected populations and considered outcomes such as suicidal ideation and suicidal actions (Bryan et al., 2014; Houtsma et al., 2017; Maguen et al., 2023; Smigelsky et al., 2020), less is known about this relationship in healthcare workers. Litz et al. (2009) describe “parasuicidal behavior” (p. 701) as a potential self-harming outcome of moral injury, along with other externalizing behaviors (alcohol and drug misuse, recklessness, etc.). One study of veterans noted that increased exposure to PMIEs was associated with increased odds of current suicidal ideation, independent of sociodemographic and other considerations, such as severity of combat exposure and lifetime mental disorders (Wisco et al., 2017).

In addition to findings in military contexts, research has begun to investigate the specific stresses experienced by healthcare professionals, particularly those aggravated by the COVID-19 pandemic (Blake et al., 2020; Williamson et al., 2020). Healthcare personnel have faced frequent and intensive morally upsetting situations, including resource allocation,

difficult patient care decisions, lack of personal protective equipment, new tasks and roles, and lack of testing options. These PMIEs, and others, can contribute to the development of moral harm (Litam & Balkin, 2021; Riedel et al., 2022). As a result, understanding moral harm in this environment is critical for devising focused solutions that meet the unique requirements of healthcare professionals. Broadening the scope of moral injury research to encompass civilian populations would improve our understanding of how PMIEs affect larger society, resulting in more comprehensive mental health policies (Greenberg et al., 2020; Jones et al., 2022).

Campbell et al. (2024) found an association between moral injury and substance use among healthcare workers, while Lathan et al. (2023) described the effects of moral injury and stress-related health effects and regulation of the autonomic nervous system. Furthermore, one study demonstrates that moral injury and post-traumatic stress disorder (PTSD), though distinct, are related to various health outcomes, including suicidality (Fani et al., 2021). PTSD may confound the association between moral injury and suicidality among workers as significant relationships between PTSD and suicidality have been observed in the literature (Fox et al., 2021; Holliday et al., 2020; Panagioti et al., 2012; Ramsawh et al., 2014). Moreover, PTSD and moral injury also have some overlapping features, including avoidance and self-harming behaviors (Litz et al., 2009). Taken together, these and other studies show the need for further exploration of moral injury in civilians, particularly as it relates to suicidality and other externalizing sequelae.

Much research has been conducted showing the effects of occupational stressors on the mental health and coping mechanisms employed by healthcare workers (Medisauskaite & Kamau, 2019; Miller, 2021; Sriharan et al., 2021; Widjaja et al., 2020; Williamson et al., 2018). Medisauskaite and Kamau (2019) found that certain ill-health outcomes and externalizing sequelae were associated with increased levels of work-related stressors among a sample of physicians in the UK. Research on COVID-19 and related health effects among healthcare workers has resulted in numerous studies describing the prevalence of suicidality - the particular outcome of interest in this study - among healthcare workers (Awan et al., 2021; Bismark et al., 2022; García-Iglesias et al., 2022; Jahan et al., 2021; Sher, 2020). Few studies, however, focus on individual suicidal outcomes (i.e., suicidal ideation) as most consider suicidal outcomes more broadly (Coimbra et al., 2023; Della Monica et al., 2022).

Organizational dynamics significantly influence the experiences and coping mechanisms of healthcare professionals regarding psychological distress, including moral injury. Johnson et al. (2024) discovered that access to well-being services was more linked to the availability of supporting resources,

such as peer networks and ease of access, than with simply removing barriers, indicating that empowering settings may foster help-seeking behavior. Similarly, de Lissier et al. (2024) reported that clinicians frequently experienced feelings of voicelessness, ethical distress, and disillusionment with institutional values, factors that led to emotional weariness and burnout. Juarez-Reyes et al. (2025) corroborated these findings by illustrating that organizational-level treatments, including mindfulness sessions, significantly alleviated stress and enhanced emotional well-being among frontline healthcare workers. Finally, Andela (2021) demonstrated that burnout, especially emotional exhaustion, moderated the association between workplace stress and suicidal ideation, further highlighting the influence of systemic workplace factors in contributing mental health effects. Though research into moral injury and associated mental health outcomes among healthcare workers is growing, there exists a lack of studies examining the associations between multiple metrics of suicidality (thoughts, plans, and attempts) and moral injury. This gap is critical to address because knowing the dimensions of suicidality helps guide targeted treatments and support networks for healthcare professionals, especially in the aftermath of the COVID-19 epidemic.

A study conducted by Houtsma et al. (2017), examined the relationship between moral injury and thwarted belongingness, connecting moral injury directly to the interpersonal theory of suicide. This study suggests that some PMIEs, in concert with certain social factors, increase the risk of experiencing thwarted belongingness among military personnel. Such an association implies that certain psychiatric mental illness events, connected with other variables, enhance the chance of experiencing thwarted belongingness among military members (Bryan et al., 2014). Combining this line of research with the interpersonal theory of suicide, it becomes clear that PMIEs might be involved in thwarted belongingness, and when combined with feelings of burdensomeness, despair, and suicidal capability, may increase the likelihood of suicidal behavior. This integration emphasizes how crucial it is to address specific psychological issues and more general societal dynamics when assessing and intervening for suicide risk in military communities (Bryan et al., 2014). Understanding the complexities of interpersonal systems and suicidal behavior allows for efficient customization of therapies to target individual risk factors.

However, few studies have examined relationships between moral injury and various externalizing outcomes in civilian populations. One study of healthcare workers found a cross-sectional association between moral injury and increased odds of non-medical use of prescription drugs, current use of other illicit substances, and hazardous drinking (Campbell et al., 2024), while Hagerty and Williams (2022) reported a positive association between

moral injury and PTSD, regardless of gender and other covariates, and that suicidal ideation among their sample of healthcare workers was approximately three times higher than the general population. The current study seeks to simultaneously expand the field of research into the relationships between moral injury and suicidality in civilian populations, specifically among healthcare workers, while also examining for potential differences in these relationships by gender.

Methods

Participants and procedure

In March 2022, we recruited a diverse sample of healthcare workers ($N=200$) using social media advertisements targeted at people working in healthcare and conducted this pilot study. Advertised as a “Healthcare Worker Stress Study,” participants were informed that their participation would require them to complete a confidential online survey with questions regarding their work and life experiences. Our eligibility requirements were being at least 18 years of age; currently employed in the United States within a hospital, ambulatory or outpatient clinic, nursing or residential facility, social assistance program, and/or home healthcare; able to read and understand English; and finally, the willingness and ability to participate. Of the 284 recruited and eligible healthcare workers, 200 (70.4%) agreed to participate in our study. After conducting sensitivity analyses, we did not find any statistically significant differences in age, gender identity, or work setting between eligible participants who chose to participate and eligible participants who chose not to participate. Informed consent was obtained from all eligible participants who completed one online survey, which lasted one hour. A \$50 gift card was provided as compensation upon completion. The study protocol was approved by the Institutional Review Board of the University of Illinois Urbana-Champaign.

Participants were employed in various healthcare settings: home healthcare, hospitals, social assistance programs, ambulatory/outpatient clinics, and nursing/residential facilities. Our sample consisted of a wide range of occupations, including registered nurses, licensed practical nurses, case managers, physical therapists, healthcare support roles (e.g., dietary aides, administrative support staff, nursing assistants), dentists, pharmacists, resident and attending physicians, mid-level providers, and healthcare administrators. Twenty-eight different US states and Washington, DC were represented, and the ages of participants ranged from 19 to 58 years, including men ($n=65$), women ($n=133$), and non-binary/genderqueer people ($n=2$). The sample was racially and ethnically diverse (Table 1). Despite the use of an online convenience sampling method, the sample

Table 1. Sample characteristics (N = 200 healthcare workers).

	% (n) or mean (±SD)
Age, years	30.8 (±7.3)
Gender Identity	–
Man	32.5% (65)
Woman	66.5% (133)
Non-binary/genderqueer	1.0% (2)
Race/Ethnicity	–
Non-Hispanic White	54.5% (109)
Non-Hispanic Black	17.5% (35)
Non-Hispanic Asian	14.0% (28)
Non-Hispanic Native American Indian or Alaska Native	1.0% (2)
Hispanic or Latinx	10.0% (20)
Other	3.0% (6)
Education	–
High school diploma or equivalent (GED)	3.0% (6)
Some college (no degree)	5.0% (10)
Associate's/Other Technical 2-year degree	14.0% (28)
Bachelor's/Other 4-year degree	35.5% (71)
Graduate or Professional degree	42.5% (85)
Family Income	–
Less than \$10,000	0.5% (1)
\$10,000–\$19,999	3.5% (7)
\$20,000–\$29,999	2.5% (5)
\$30,000–\$39,999	4.5% (9)
\$40,000–\$49,999	10.0% (20)
\$50,000–\$74,999	19.5% (39)
\$75,000–\$99,999	20.0% (40)
\$100,000–\$149,999	24.0% (48)
\$150,000 or more	15.5% (31)
Years in Job	–
Less than 1 year	14.5% (29)
1–5 years	61.0% (122)
6–10 years	17.5% (35)
11–20 years	6.0% (12)
More than 20 years	1.0% (2)
Hospital Setting	–
No	46.0% (92)
Yes	54.0% (108)
Occupational Level	–
Prescriber/Administrator	24.5% (49)
Other Healthcare Worker	75.5% (151)

SD = standard deviation.

included substantial diversity across demographic variables such as race/ethnicity, age, gender identity, and geographic location, supporting the relevance of findings across varied populations.

Measures

Moral injury

Similar to other studies of healthcare workers (Campbell et al., 2024; Hines et al., 2021), we used a modified version of the Moral Injury Events Scale (MIES; Nash et al., 2013). To avoid overburdening our participants, we chose the MIES over other measures of moral injury, such as the Moral Injury Questionnaire (MIQ), due to its shorter length and previous use with this population. Initially developed for use in military populations, the MIES

instructions and item-specific language were modified to reflect healthcare workers (e.g., "...your experiences as a *healthcare worker*" and "I feel betrayed by others outside the *healthcare industry*"). The MIES contains 9 items assessing perceived transgressions of self/others and perceived betrayals by others on a 6-point Likert scale with total scores ranging from 9 to 54. We reverse-coded each item (6: strongly agree, 5: agree, 4: somewhat agree, 3: somewhat disagree, 2: disagree, 1: strongly disagree) to allow higher individual item and total scores to be indicative of greater moral injury ([Supplemental Table](#)). This measure showed good internal consistency in our sample ($\alpha = 0.93$), and a recent meta-analysis demonstrates that the MIES is an internally reliable tool for measuring potentially morally injurious events and distress across diverse populations and contexts (Steen et al., [2024](#)).

Past-year suicidality

In line with other survey-based research, including the National Survey on Drug Use and Health (NSDUH), we assessed past-year suicidal thoughts with the question "At any time in the past 12 months, up to and including today, did you seriously think about trying to kill yourself?" We assessed past-year suicide planning with the question "During the past 12 months, did you make any plans to kill yourself?" and past-year suicide attempts with the question "During the past 12 months, did you try to kill yourself?" Consistent with the NSDUH, only those who endorsed suicidal ideation were presented with questions on suicide planning and attempts. Participants were given the response options of "No" and "Yes" for each of these questions. Participants who did not endorse past-year suicidal ideation were coded as "No" for past-year suicide planning and attempts. Of note, all participants were provided with a list of national resources upon survey completion, and a link to the National Suicide Prevention Lifeline was embedded within the survey when asked about suicidality.

Gender

Gender identity was self-reported by participants, with response options including 1) man, 2) woman, and 3) non-binary, genderqueer, or other gender. Due to a small number of non-binary, genderqueer, or other gender participants, ($n = 2$), these participants were excluded from models in which gender was of interest (i.e., interaction models by gender). These participants were included in other models.

Covariates

Since PTSD may confound the association between moral injury and suicidality (Fox et al., [2021](#); Holliday et al., [2020](#); Panagioti et al., [2012](#);

Ramsawh et al., 2014), we included probable PTSD (no/yes) as a binary covariate in our adjusted models which was assessed by the PTSD Checklist (PCL-5), a 20-item self-report measure of PTSD symptoms based on clinical criteria from the DSM-5 (Bovin et al., 2016).

Analytic plan

After characterizing our sample using descriptive statistics, we examined the main effects of moral injury on several measures of suicidality (i.e., thoughts of suicide, suicide plans, suicide attempts) using separate bivariate analysis and logistic regression models. Odds ratios (ORs) and 95% confidence intervals (CIs) are reported. Next, we added PTSD as a covariate to our regression models, with adjusted odds ratios (aORs) and 95% CIs reported. We then added a separate interaction term to each fully adjusted model representing the cross-products of moral injury with gender to search for differences in the relations between moral injury and suicidality based on gender.

Results

Descriptive results

Suicidality was prevalent among our sample; 13.6% reported seriously thinking about ending their life in the prior 12 months. Further, 6.1% endorsed making a suicide plan and 4.6% endorsed making a suicide attempt in the past year. The mean ($\pm$ SD) Moral Injury Events Scale (MIES) score was 23.8 ($\pm$ 12.1). Moral injury was significantly higher among those reporting past-year suicidal thoughts ($p < 0.001$; [Figure 1](#)), planning ($p = 0.002$), and attempt ($p = 0.001$). Men and women had similar mean ($\pm$ SD) MIES scores (24.8 $\pm$ 12.1 vs. 23.4 $\pm$ 12.2, respectively; $p = 0.467$). There was no statistically significant difference between men and women in the prevalence of past-year suicidal thoughts (15.4% vs. 12.8%, respectively; $p = 0.616$). However, men appeared to be more likely to endorse past-year suicide planning (men: 10.8%, women: 3.8%; $p = 0.052$) and past-year suicide attempt (men: 9.2%, women: 2.3%; $p = 0.027$) than women. The mean ($\pm$ SD) PCL-5 score for this sample of healthcare workers was 16.8 ($\pm$ 16.1), and 22.2% of the sample had a score indicative of probable PTSD.

Main effects of moral injury on suicidality

Among this sample, greater MIES scores were associated with higher odds of past-year suicidal thoughts (OR = 1.07; $p < 0.001$; [Table 2](#)), planning (OR = 1.08; $p = 0.004$), and attempt (OR = 1.09; $p = 0.004$). After controlling for probable PTSD, greater moral injury remained significantly

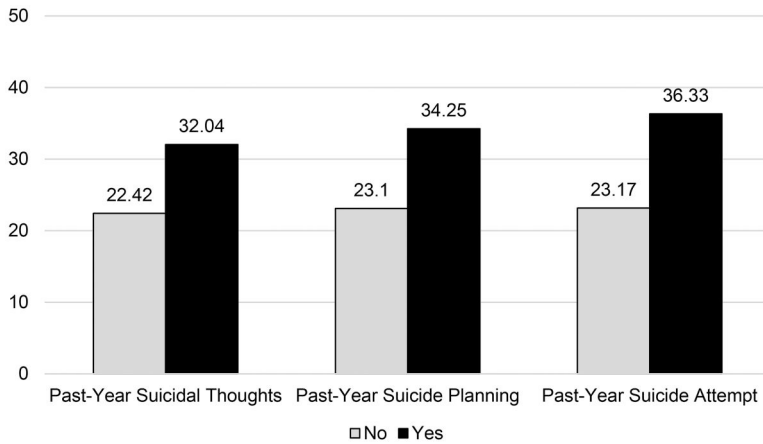


Figure 1. Mean moral injury events Scale scores by suicidal thoughts and behaviors.

Table 2. Main effects of moral injury and suicidal thoughts and behaviors.

	Past-Year Suicidal Thoughts		Past-Year Suicide Planning		Past-Year Suicide Attempt	
	OR (95% CI)	aOR (95% CI)	OR (95% CI)	aOR (95% CI)	OR (95% CI)	aOR (95% CI)
Moral Injury	1.07*** (1.03, 1.10)	1.05* (1.01, 1.09)	1.08** (1.02, 1.13)	1.06 (1.00, 1.12)	1.09** (1.03, 1.16)	1.07 (0.99, 1.16)

Note. Adjusted models control for probable PTSD (yes/no).

$p < 0.10$.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.01$.

OR = odds ratio; aOR = adjusted odds ratio; CI = confidence interval.

associated with higher odds of past-year suicidal thoughts (aOR = 1.05; $p = 0.017$). Greater moral injury was only associated with past-year suicide planning (aOR = 1.06; $p = 0.066$) and suicide attempt (aOR = 1.07; $p = 0.072$) at a trend level in adjusted models. However, the direction and magnitude of the effects were consistent with unadjusted models.

Interaction effects of moral injury and gender on suicidality

After adding a cross-products term representing the interaction between MIES score and gender to each adjusted model, we found no statistically significant interactions on past-year suicidal thoughts (aOR = 0.94; $p = 0.264$; [Figure 2](#)), planning (aOR = 0.97; $p = 0.618$; [Figure 3](#)), or attempts (aOR = 0.93; $p = 0.425$; [Figure 4](#)).

Discussion

Our study provides insight into the complex and frequently fatal link between moral injury and suicidality among healthcare personnel. Though

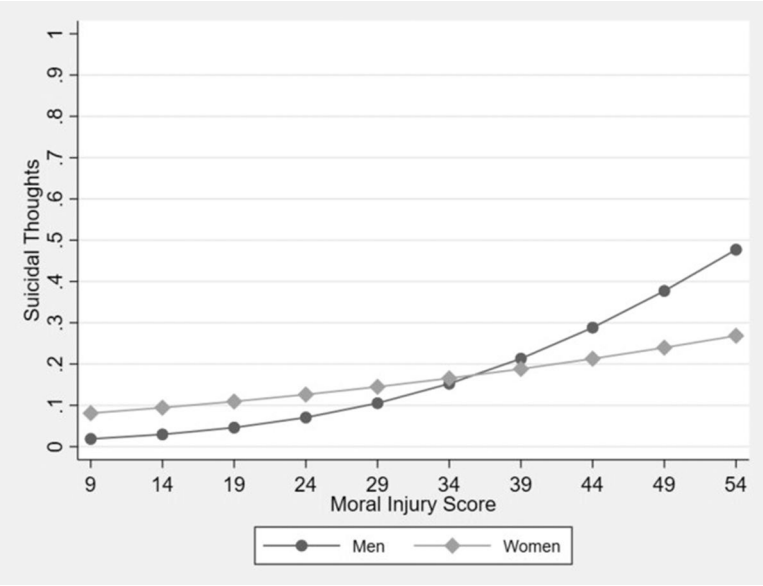


Figure 2. Predictive margins of past-year suicidal thoughts by moral injury score and gender.

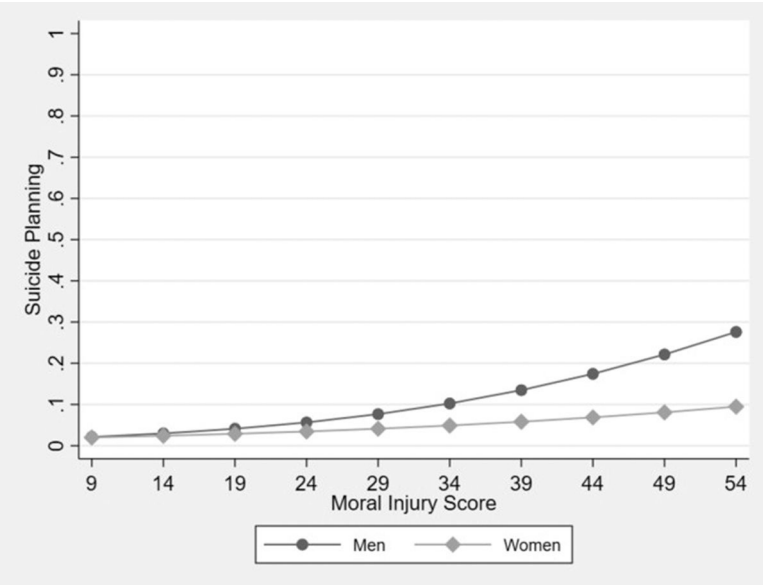


Figure 3. Predictive margins of past-year suicide planning by moral injury score and gender.

historically focused on veterans and military-connected populations, our findings highlight that moral injury may also impact the suicidality of civilians. Prior research has established the relationship between moral injury and externalizing sequelae such as suicide in military-connected populations (Bryan et al., 2014; Litz et al., 2009; Smigelsky et al., 2020; Wisco et al., 2017). Growing research among civilian populations, however, has

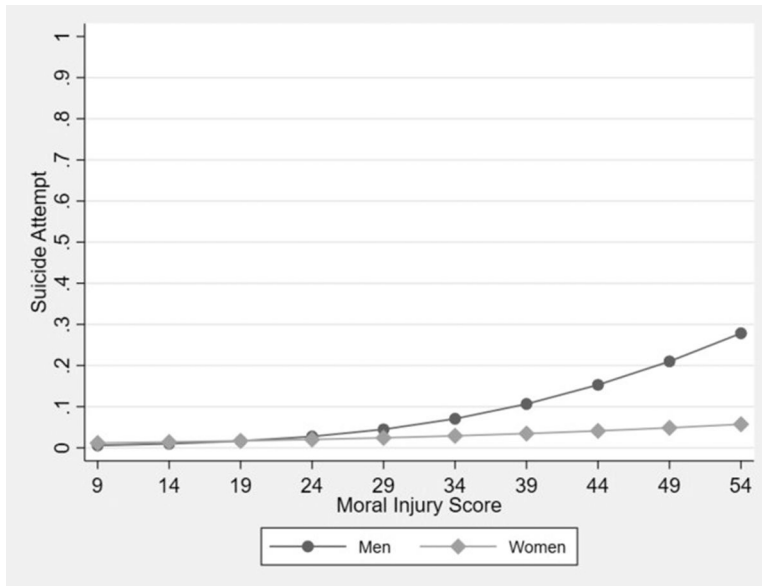


Figure 4. Predictive margins of past-year suicide attempt by moral injury score and gender.

deepened our understanding of moral injury and its related outcomes (Campbell et al., 2024; Hegarty et al., 2022; Hines et al., 2021; Plouffe et al., 2021; Spilg et al., 2022), and the current study adds to this by examining the specific associations between moral injury and suicidality, as well as the associations between moral injury and suicidal thoughts, plans, and attempts, separately. Results from this study suggest that healthcare workers experience moral injury and moral injury is associated with an increased likelihood of suicidality. The prevalence of measures of suicidality were markedly higher among these healthcare workers compared to the national population: 13.6% of our sample reported suicidal thoughts (compared to 4.3% nationally), 6.1% reported suicide planning (compared to 1.3% nationally), and 4.6% reported a suicide attempt (compared to 0.6% nationally) (Centers for Disease Control & Prevention, 2024). These findings are striking and highlight an urgent need for specific interventions and support mechanisms in the healthcare sector.

Together with other findings (Awan et al., 2021; Davis et al., 2021; Hawton et al., 2011; Harvey et al., 2021; Mortier et al., 2022; Padmanathan et al., 2023), our study suggests that not only do civilians in healthcare occupations experience both moral injury and suicidality, but also that these experiences may be related. We found that greater MIES scores were associated with higher odds of suicidal thoughts, plans, and attempts. In line with other work (Hagerty & Williams, 2022), our study found no gender-based differences in the associations between moral injury and suicidality. This absence of gender-based distinctions shows that moral damage affects all healthcare professionals,

emphasizing the issue's ubiquitous nature. However, in line with national estimates (Centers for Disease Control and Prevention) we did find that men in our study were more likely to endorse past-year suicidal plans and attempts compared to women, though no differences were observed in the prevalence of suicidal thoughts. Similar differences have been observed in military populations (e.g., Kang et al., 2015).

Military-focused studies have presented the distinctions between moral injury and PTSD (Barnes et al., 2019; Koenig et al., 2019). Our study shows that above and beyond the apparent effects of PTSD, healthcare workers reporting higher MIES scores also report greater odds of suicidal thoughts. Additionally, our work adds to the conversation surrounding the relationship between PTSD and moral injury, particularly as it relates to suicidal outcomes among healthcare workers. These results suggest that, like military-connected populations, moral injury is a discreetly experienced phenomenon in healthcare settings. The distinction between PTSD and moral injury in this context emphasizes the importance of therapies that prevent and address the unique subtleties of moral injury among healthcare personnel.

Limitations

Our study has limitations, most notably the use of cross-sectional data, which can make it difficult to ascertain causal relationships. Further, the use of self-report data can present social desirability and other biases. However, often preferred by participants (Perlis et al., 2004; Waruru et al., 2005), the use of computerized, confidential reporting instruments and validated measures of suicidality help address these concerns. Lastly, the use of a social media-based convenience sample may have led to self-selection bias. However, our sample was quite diverse with respect to race/ethnicity, education, income, occupation, and state of residence. Additionally, women made up approximately 60% of our sample, which is comparable to national estimates for the healthcare workforce (U.S. Bureau of Labor Statistics, 2021). This is important considering our findings relating to moral injury and gender.

Conclusions and future directions

Our study presents evidence and furthers research that moral injury is both present and highly prevalent among civilians. Our findings suggest that moral injury may impact the suicidality of healthcare workers, and institutions working with and serving healthcare workers should make resources available to help cope with moral injury. Future studies should focus on longitudinal data to better understand the drivers and long-term consequences of moral harm in this group. While our study looked at differences

in occupational level, studies exploring differences across occupations that provide direct care to patients and those that do not may also be warranted. Furthermore, intervention studies are required to design and test techniques to reduce the impact of moral harm on healthcare professionals' mental health. As research has shown that increasing the number of mental and behavioral health facilitators may increase program uptake (Johnson et al., 2024) and mindfulness-based interventions prove effective in treating mental burdens experienced by healthcare workers (Juarez-Reyes et al., 2025), these options may prove useful in addressing moral injury among healthcare workers if explored in more depth.

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

Benjamin M. Campbell  <http://orcid.org/0000-0001-6427-2222>

Tourna N. Khan  <http://orcid.org/0009-0008-8514-9889>

Rachel A. Hoopsick  <http://orcid.org/0000-0001-5992-9007>

Data availability statement

Data will be provided upon reasonable request to the corresponding author.

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