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Moral Injury and Psychosocial Functioning in Healthcare Workers During the COVID-19 Pandemic

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Abstract

Background: Studies of moral injury among non-military samples are scarce despite repeated calls to examine the prevalence and outcomes of moral injury among civilian frontline workers. **Objective:** To describe the prevalence of moral injury and examine its association with psychosocial functioning among healthcare workers during the COVID-19 pandemic. **Method:** We surveyed healthcare workers (N = 480), assessing exposure to potentially morally injurious events (PMIEs) and psychosocial functioning. Data were analyzed using Latent Class Analysis (LCA) to explore patterns of PMIE exposure (i.e., classes) and corresponding psychosocial functioning. **Results:** The *Minimal Exposure* class, who denied PMIE exposure, accounted for 22% of healthcare workers. The *Moral Injury – Other* class included those who had witnessed PMIEs for which others' were responsible and felt betrayed (26%). The *Moral Injury-Self* class comprised those who felt they transgressed their own values in addition to witnessing others' transgressions and feeling betrayed (11%). The *Betrayal-Only* class included those who felt betrayed by government and community members but otherwise denied PMIE exposure (41%). Those assigned to the *Moral Injury – Self* class were the most impaired on a psychosocial functioning composite, followed by those assigned to *the Moral Injury – Other* and *Betrayal-Only* classes, and finally the *Minimal Exposure* class. **Discussion:** Moral injury is prevalent and impairing for healthcare workers, which establishes a need for interventions with healthcare workers in organized care settings.

Keywords: Moral Injury, Organized Care, COVID-19, Healthcare Workers

Impact Statement: Healthcare workers experienced stressors that transgressed their moral beliefs during the COVID-19 pandemic. Those who were troubled by their own actions or failures to act had the most severe work, relationship, and personal care problems, followed by those troubled by the actions of others or of their institutions.

Moral Injury and Psychosocial Functioning in Healthcare Workers During the COVID-19 Pandemic

Mental health problems and professional burnout surged among healthcare workers during the COVID-19 pandemic (Smith et al., 2021; Wright et al., 2021). Theory suggests this was due in part to a pandemic-related increase in their exposure to highly stressful events that transgressed their moral beliefs, precipitating a moral injury (Čartolovni et al., 2021; Maguen & Price, 2020; Moens, 2021; Roycroft et al., 2020; Rushton et al., 2021; Williamson et al., 2020). Among veterans, moral injury is associated with suicidal thoughts and behaviors (Maguen et al., 2022; Nichter et al., 2021), psychiatric syndromes (e.g., posttraumatic stress disorder [PTSD] and Major Depressive Disorder; Currier, McDermott, et al., 2019), poor relational and occupational functioning (Maguen, Griffin, Copeland, Perkins, Finley, & Vogt, 2020), substance misuse (Maguen et al., 2021), and religious or spiritual struggles (Currier et al., 2019). As such, scholars have called for studies that examine moral injury in civilians (Litz & Kerig, 2019; Steinmetz et al., 2019), especially frontline workers responding to crises and disasters such as the COVID-19 pandemic (Maguen & Price, 2020; Williamson et al., 2020). In response to these calls, we conducted one of the first empirical studies of the relationship between moral injury and psychosocial functioning among civilians working in an organized healthcare setting at the onset of the COVID-19 pandemic.

Moral injury is defined as "the lasting psychological, biological, spiritual, behavioral, and social impact of perpetrating, failing to prevent, or bearing witness to acts that transgress deeply held moral beliefs and expectations" (Litz et al., 2009, pp. 697). Similar to other trauma- and stressor-related syndromes (e.g., PTSD), moral distress is a consequence of exposure to an event that one perceives to be a violation of one's deeply held moral beliefs, otherwise known as a

potentially morally injurious event (PMIE; Čartolovni et al., 2021; LeClaire et al., 2022; Norman et al., 2021). The term "moral distress" encompasses a wide range of reactions stemming from self-perceived complicity in acts that violate one's professional ethics and/or internalized personal values (Epstein et al., 2019; Jameton, 1984; Varcoe et al., 2012). Whereas moral distress is sometimes acute and adaptive, repetitive and/or severe moral distress can lead to chronic and maladaptive problems characterized as a "moral injury" (Griffin et al., 2019; Jinkerson, 2016).

Descriptive studies have explored types and categories of PMIEs, which include witnessing events for which others are primarily responsible (*Moral Injury-Other*) or transgressing one's own values by what one did or failed to do (*Moral Injury-Self;* Litz et al., 2018; Presseau et al., 2019; Stein et al., 2012). For example, healthcare workers have reported guilt from mechanically providing care without empathy (Gibbons et al., 2013) or prioritizing tasks over patients' dignity (Choe et al., 2015). Rushton et al. (2021) described this as "routinizing" suffering in order for their work to be bearable. Futhermore, in the limited empirical literature among healthcare workers, moral injury has been linked to mental health problems and professional burnout (Ehman et al., 2021; Hines et al., 2021; Khan et al., 2021; Mantri et al., 2020). While a sound case can be made that healthcare workers are at risk for moral injury, empirical studies of moral injury in this population are long overdue (Maguen & Price, 2020; Roycroft et al., 2020; Rushton et al., 2021; Williamson et al., 2020).

This gap in the literature has been underscored by the suspected rise in PMIEs among healthcare workers due to the pandemic. For example, risk factors for moral injury that are pertinent to the COVID-19 pandemic include exposure to loss of life, perceived lack of social support from peers or leaders, and role conflict between healthcare workers' commitments at

work and home (Maguen & Price, 2020; Smith et al., 2021; Williamson et al., 2020). In sum, the COVID-19 literature is replete with hypotheses that the pandemic resulted in greater prevalence of risk factors for moral injury among healthcare workers in organized care settings. Still, these hypotheses about moral injury among civilian healthcare workers must be empirically examined.

Moral Injury and Spiritually Integrated Care

As noted above, spiritual concerns are often integral to the clinical presentation of moral injury (Currier et al., 2019), with spirituality defined as beliefs and experiences involving connectedness, meaning, and the sacred, which are not necessarily religious or faith-based (Harris, Howell, et al., 2018). Thus, many treatments for moral injury include some level of spiritual integration. At this time, there are five treatments for moral injury that are supported by at least one randomized clinical trial (RCT): Adaptive Disclosure (Litz et al., 2021), Impact of Killing (Maguen et al., 2017), the Self-Forgiveness Workbook (Griffin et al., 2015), Trauma Informed Guilt Reduction therapy (Norman et al., 2022), and Building Spiritual Strength (Harris et al., 2011; Harris, Usset, et al., 2018). Each of these either includes an option to construe recovery work spiritually, focuses on forgiveness of self or others, or explicitly frames the intervention in spirituality. Likewise, aspects of spirituality may be linked to prevention of other trauma- and stressor-related syndromes and thus may be pertinent to prevention of moral injury. For example, positive religious coping is associated with decreased traumatic stress (Park et al., 2017; Zhang et al., 2021), and spiritual fortitude is a protective factor against burnout among healthcare workers (Ada et al., 2021). In order to prevent moral injury, facilitate moral repair, and bolster spiritual protective factors, we need a better understanding of moral injury patterns among healthcare providers and ways moral injury impacts their psychosocial functioning.

The Present Study

The present study addresses two major gaps in the moral injury literature. The first gap is the need for empirical, quantitative research on moral injury in civilian populations. We addressed this by examining moral injury among healthcare workers, surveyed in fall 2020, during a surge in COVID-19 infections. The second gap we address is the need to further the science of moral injury by disaggregating different types of PMIE exposure and their corresponding outcomes. We address this gap by using person-centered statistical methods to analyze healthcare workers' responses to a modified version of the most widely used self-report measure of PMIE exposure and moral distress (Nash et al., 2013). This method enabled us to examine the prevalence of independent and co-occurring betrayal and perceived transgressions by self and others, and the impact of types of perceived transgressions on psychosocial functioning at work, at home, and with personal care. Our research questions were the following: (1) What are the prevalences and patterns of PMIE exposure and moral distress among healthcare workers during the pandemic and (2) in what ways are patterns of PMIE exposure associated with psychosocial functioning?

Method

Participants

Participants (N = 480) were healthcare workers in the Rocky Mountain region of the United States (U.S.). The majority were female (80.9%, n = 376), White (93.3%, n = 448), and on average 41 years old (Table 1). The sample was primarily providers of direct patient care (72.0%). Within direct care providers, 44.5% were nurses, 17.2% were clinical technicians, 7.0% attending physicians, 5.2% residents or fellows, 5.2% mental health professionals, 5.2% pharmacists/pharmacy staff, 4.1% advanced practice clinicians, and 11.6% had other direct care occupations. Healthcare workers who did not provide patient care had administrative/clerical (31.3%), management (20.1%), research (14.9%), education (6.0%), service (3.7%), health

information management (1.5%), and other non-clinical (22.4%) occupations. On average, healthcare workers had been in their job or career for 12.1 years.

Procedure

This study was approved by the Institutional Review Board (IRB) of The University of Utah. Healthcare workers were recruited via a mass email to their work email address as part of a weekly COVID-19 e-newsletter. Initial consent confirmation was obtained on the first survey page prior to accessing the rest of the survey. They participated voluntarily, without any incentive or requirement to participate. The initial online survey was available in March-April 2020, and healthcare workers in the current study comprise those who elected to participate in optional follow-up surveys. The Sept.-Nov. 2020 follow-up survey was utilized for the current study. For more information on the parent study, see Smith et al. (2021) and Wright et al. (2021).

Measures

***Moral Injury*.** The Moral Injury Events Scale (MIES; Nash et al., 2013) adapted by Khan et al. (2021) to capture pandemic-related moral injury was used. Nine items comprise the adapted scale that inquire about witnessing a transgressive event for which others are responsible (items 1-2), perpetrating a transgressive event for which the participant was responsible because of what they did (commission; items 3-4) or failed to do (omission; items 5-6), and being betrayed by the government, community members, and healthcare or public health organizations (items 7-9). Participants rated each item using a 6-point response format from 1 = *strongly disagree* to 6 = *strongly agree*. Consistent with prior studies (Maguen, Griffin, Copeland, Perkins, Richardson et al., 2020), we collapsed item-level responses into two categories to enhance the interpretability of results: those who reported slight, moderate, and strong *disagreement* (“0”) and those who reported slight, moderate, and strong *agreement* (“1”). For the present sample, internal

consistency for the adapted MIES full scale was good, α = .823.

Functional Impairment. The Brief Inventory of Psychosocial Functioning (B-IPF; Kleiman et al., 2020) was designed to assess past-month functional impairment in individuals exposed to highly stressful events. Each of the seven items assesses a functional domain: romantic relationships, family relationships, work, friendships and socializing, parenting, education, and personal care. An example item is, "I had trouble in my romantic relationship with my spouse or partner." Participants rated each item using a 7-point response format from 0 = *not at all* problematic to 6 = *very much* problematic; individuals for whom a particular domain was not relevant selected *not applicable* (e.g., participants select not applicable on the parenting item if they do not have children). An index of overall functional impairment is also computed by summing the items completed by the respondent, dividing by the maximum possible score based upon the number of applicable items, and multiplying by 100 (Kleiman et al., 2020). For the overall and for item scores, higher scores indicated greater impairment. For the present sample, internal consistency for the B-IPF was acceptable, α = .767.

Data Analysis

Latent Class Analysis (LCA) was used to identify subgroups who reported similar patterns of exposure to potentially morally injurious events. We specified a series of models with an iteratively greater number of classes to determine the optimal number of classes. Models with lower values on the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and sample-size adjusted Bayesian Information Criterion (aBIC) were prioritized. We also examined the Lo-Mendell-Rubin Likelihood Ratio Test (LRT) and the Bootstrapped Likelihood Ratio Test (BLRT). Significant *p*-values on the likelihood ratio tests indicate that a model with *k* – 1 classes should be rejected in favor of a model with *k* classes (Asparouhov & Muthén, 2012).

We also considered relative entropy values, such that models for which the value was greater than 1.00 and no less than 0.70 were preferred (Nylund et al., 2007). Finally, we examined the proportion of participants assigned to each profile and form of each extracted class, because superfluous profile extraction occurs when small subsamples are assigned to classes with only minor differences in form from other classes (Hipp & Bauer, 2006).

Once we determined the model containing the optimal number of classes, we assigned labels for each of the classes based on the patterns of conditional probabilities for endorsing each of the MIES items. Conditional probabilities approaching 1.0 indicated that members of a given latent class were more likely to endorse the corresponding type of exposure. Finally, consistent with Asparouhov and Muthén's (2014) recommendations regarding the three-step procedure, we entered participants' total and item-level functioning scores into the model as auxiliary variables using the DU3STEP command to compare mean differences. To reduce family-wise error rates, an overall Wald test was performed for each correlate, followed by class-by-class chi-square tests where appropriate. Item-level comparisons were omitted for the B-IPF items that assessed parenting and education/training functioning because cell counts were insufficient to compare means (e.g., too few individuals in a latent class reported either parenting children or attending school). We analyzed the data using M*plus* (Version 8.5; Muthén & Muthén, 2017).

Results

Preliminary Analyses

Table 2 shows healthcare workers' item-level responses to the COVID-19 adapted MIES. Approximately a third (35.9%) of healthcare workers reported being troubled by one or more PMIEs that they witnessed, 14.9% were troubled by what they did, 11.8% were troubled by what they failed to do, 75.7% felt betrayed by the government, 71.5% felt betrayed by others in their

community, and 32.2% felt betrayed by healthcare or public health organizations. The MIES total sum score was moderately correlated with the B-IPF total sum score, i.e., greater overall psychosocial impairment, $r = .39$, $p < .001$.

Latent Class Analysis. Table 3 displays fit statistics and other metrics for comparing models specifying 2-6 classes. Information criterion indices improved with specification of the 2-, 3-, and 4-class models, though the BIC indicated that neither the 5- nor 6-class models fit the data any better than the 4-class model. The BLRT improved for each model with an additional class; however, the LRT identified the 4-class solution as optimal. We inspected the plotted conditional probabilities by class and the percentages of the sample assigned to each class (Supplemental Figure S1). The and 5- and 6-class models appeared over-extracted because small percentages of the sample (< 5%) were assigned to additional classes, with only minor differences in form when compared to classes identified in the more parsimonious 4-class model. Entropy for the 4-class solution also indicated high classification accuracy. Thus, we determined the 4-class solution contained the optimal number of latent classes, based on a preponderance of fit indices, parsimony, and classification accuracy.

Figure 1 depicts the plotted conditional probabilities from the 4-class model of healthcare workers' responses to the MIES. Figure 2 shows a conceptual model of the nested classes that emerged. We assigned the label *Minimal Exposure* to the class (22%) that had low probability of endorsing any MIES item. We assigned the label *Betrayal Only* (41%) to the class that had high probability of endorsing MIES items that assess institutional and systemic betrayal, but low likelihood of endorsing any other MIES item. Respondents assigned to the *Moral Injury – Other* class (26%) had high probability of endorsing MIES items that assess witnessing others' transgressive acts and betrayal, but low probability of endorsing MIES items that assess

perceived transgression of one's own values. Finally, the remainder were assigned to the *Moral Injury – Self* class (11%) which consisted of healthcare workers with high probability of endorsing any item, including items on perceived perpetrations and related moral distress.

Mean Difference Comparisons by Class. In Table 4, we report means and corresponding Wald Chi-Square difference tests for the B-IPF total score and item-level scores by latent class. The overall Wald test indicated significant differences in mean total functioning scores between classes, χ^2 (3) = 44.58, p <.001. In comparison to healthcare workers assigned to the *Minimal Exposure* class (M = 17), those assigned to the *Betrayal Only* (M = 31), *Moral Injury – Other* (M = 35), and *Moral Injury – Self* (M = 50) classes reported significantly worse functioning overall. There was no evidence to suggest differences in overall functioning between those assigned to the *Betrayal Only* and *Moral Injury – Other* classes (a 4-point difference in mean overall psychosocial functioning). However, healthcare workers assigned to the *Moral Injury – Self* class reported significantly worse overall functioning than the other classes (i.e., a 15-point difference in mean overall psychosocial functioning between the *Moral Injury – Self* and *– Other*). Using cutoffs from Kleiman et al. (2020), overall psychosocial functioning was in the moderate impairment range (31-50) for the *Moral Injury-Self, Moral Injury-Other,* and *Betrayal Only* classes and was in the mild impairment range (11-30) for the *Minimal Exposure* class.

Item-level comparisons revealed domain-specific differences in functioning between healthcare workers assigned to each class (Table 4). The *Moral Injury-Self* class reported significantly worse personal care, socialization, and familial relationships, followed by *Moral Injury-Other* and *Betrayal Only* classes. The *Moral Injury-Self* and *Moral Injury-Other* classes had similar impairment in romantic relationships and occupational functioning relative to the *Betrayal-Only* class. Mean difference comparisons by class were not computed for the

education/training and parenting items of the B-IPF because too few participants were parents, students, or in training.

Discussion

The science of moral injury is burgeoning; to date, most empirical studies of moral injury have examined Veterans (Griffin et al., 2019). However, the COVID-19 pandemic brought attention to the gap in empirical data on moral injury in civilians, particularly civilian healthcare workers responding to disasters (Maguen & Price, 2020; Norman et al., 2021). Our study is one of the largest empirical studies of moral injury in civilians who work in organized health care settings. Likewise, it is one of the first quantitative, empirical investigations of moral injury among frontline workers responding to the COVID-19 pandemic. Furthermore, our findings on the nested nature of betrayal, moral injury-other, and moral injury-self and their impact on functioning address Litz' and Kerig's (2019) call for research to disaggregate types of PMIE exposure and associated outcomes.

Our findings shed light on PMIE exposure prevalence among organized care workers during the COVID-19 pandemic. Prevalence was 41% for PMIE exposure from witnessing a perceived transgression and 21% for PMIE exposure from transgressing one's own values. Prevalence of any form of betrayal was 82% for healthcare workers. For comparison, among returning post-9/11 Veterans, prevalence of PMIE exposure from witnessing was 28%, perpetrating was 19%, and being betrayed was 41% (Maguen, Griffin, Copeland, Perkins, Finley, & Vogt, 2020). PMIE exposure prevalence thus appeared much higher in our sample relative to returning Veterans, although our prevalence estimates for healthcare workers are likely inflated by the peri-stressor context of the ongoing COVID-19 pandemic, compared to post-stressor, retrospective prevalence rates for military Veterans.

The following patterns of PMIE exposure and distress emerged: workers with minimal PMIE exposure (*Minimal Exposure* class); workers with a sense of betrayal but otherwise minimal PMIE exposure (*Betrayal Only* class); workers high in witnessing PMIEs and feeling betrayed (*Moral Injury-Other* class); and workers high in perpetrating PMIEs, witnessing PMIEs, and feeling betrayed (*Moral Injury-Self* class). Thus, it appears PMIE exposure is nested (Figure 2), such that betrayal is a common context in which PMIEs occur, and transgressing one's own values tends to happen within the context of witnessing others' wrongful actions. Healthcare workers assigned to the *Moral Injury – Self* class reported the most severe functional impairment, followed by the *Moral Injury-Other* and *Betrayal Only* classes, with the least impairment for the *Minimal Exposure* class. Therefore, although moral injury-self is less common than moral injury-other, it is more impairing for work performance, relationships, and personal care.

Illustrating the nested nature of moral injury and its psychosocial impairment, a recent case study (Rushton et al., 2021) described a nurse who denied visitation to the family of a dying patient due to the risk of transmitting the COVID-19 virus (i.e., moral injury – self), after physicians withheld potentially life saving treatments such as a ventilator (i.e. moral injury - other) in accordance with hospital policy due to lack of supply and the patient's poor prognosis (i.e., institutional betrayal). In cases such as this one, functional impairment might involve the nurse concealing their experience and withdrawing from relationships at work and home (i.e., impaired relationships), or overworking themselves in an effort to compensate for their perceived transgression (i.e., impaired occupational functioning).

Implications

The current findings suggest that moral injury is a prevalent and pernicious problem

among healthcare workers in organized care settings, especially during disasters such as the COVID-19 pandemic. Implications of the high impairment from moral injury include the need for new and adapted interventions for civilian moral injury. The high prevalence of instutional betrayal, and betrayal as the context for moral injury, underscores the implications for organized care administrators and leaders.

Interventions for Moral Injury in Civilians. Interventions to address moral injury are in various stages of development with active-duty military personnel and Veterans. Examples include Adaptive Disclosure (Gray et al., 2012; Litz et al., 2017, 2021) and Impact of Killing (Maguen et al., 2017; Purcell et al., 2018), which are individual psychotherapies designed to be administered by mental health providers. Building Spiritual Strength (BSS; Harris et al., 2011; Harris, Usset, et al., 2018; Usset et al., 2021) is a group program for moral injury that can be led by chaplains, mental health providers, or both. The Mental Health Clinician/Chaplain Collaboration (MC3) intervention is delivered by a Veterans Affairs chaplain in employee wellness programs to address symptoms of moral injury by facilitating forgiveness and community reintegration (Pyne et al., 2019, 2021). Levels of spiritual integration vary across these interventions. For instance, spiritual challenges are addressed in Adaptive Disclosure if the client brings them up, whereas the spiritual dimensions of moral injury are directly addressed in BSS and MC3, by facilitating psychospiritual development to integrate potentially conflicting moral perspectives and encouraging participation in amend-making behavior through engagement with the client's chosen religious/spiritual communities.

Even while moral injury interventions continue to be developed or adapted to civilian contexts, professionally trained chaplains are an existing resource that organized care institutions could draw upon to address moral injury. The role of healthcare chaplains is somewhat unique

regarding their focus of serving spiritual and emotional needs of healthcare staff and leaders, in addition to patients (Antoine et al., 2021; Galchutt et al., 2022; Snowden, 2021; Szilagyi et al., 2021; Timmins et al., 2018). They are frequently trained in addressing issues of self/other forgiveness in spiritually-integrated, pluralistic ways (Harris, Usset, et al., 2018; Pyne et al., 2019, 2021). Organizational structure often permits chaplains more flexibility than mental health professionals in providing immediate care to healthcare workers after PMIE exposure. Furthermore, given both the shortages in mental health professionals across health systems and the stigma associated with use of mental health services in some settings (Auerbach & Miller, 2020), delivery of moral injury interventions by chaplains is a promising solution.

Institutional Betrayal versus Organizational Trust/Support. Leaders of organized care institutions have the capacity to reduce institutional betrayal, through provision of increased social support for healthcare workers. Perceived institutional betrayal is prevalent among healthcare workers during the COVID-19 pandemic, with over two thirds of healthcare workers feeling betrayed by government leaders and their communities in this study. Prior studies of military-related moral injury (Maguen, Griffin, Copeland, Perkins, Richardson, et al., 2020; Zerach et al., 2021) corroborate our findings that institutional betrayal is a context in which people are more likely to transgress their moral beliefs. Specifically, a sense of betrayal by these entities indicates lack of social support from healthcare workers' communities and institutions. Social support is vital for resilient adapatation to potentially traumatic events (Smith et al., 2015, 2022) and to PMIEs (Feingold et al., 2019; Levi-Belz et al., 2022). For healthcare workers to heal from moral injury, supportive relationships with their communities and institutions are necessary.

Organized care administrators and leaders could potentially prevent or mitigate moral

injury by reducing this sense of institutional betrayal. Williamson et al. (2020) gave practical recommendations to occupational leaders for preventing and intervening around pandemic-related moral injury in healthcare settings. They recommended frank, evidence-informed discussions of moral injury with their staff, including discussion of the potential impact of moral injury on occupational and relationship functioning, and regular check-ins by leadership or qualified spiritual/mental health providers. In the absence of a strong evidence base for moral injury interventions, especially with civilians, these general recommendations are corroborated by our findings that moral injury typically occurs in the context of institutional betrayal, and our findings on the associations between moral injury and psychosocial functioning.

Limitations

Several limitations should be considered when interpreting our results. While the MIES is currently the most widely used self-report measure of moral injury (Nash et al., 2013), it has several psychometric weaknesses. Both exposure (e.g., "I saw things that were morally wrong") and distress (e.g., "I am troubled by having witnessed others' immoral acts") items are combined in this scale; so, the MIES can be utilized to identify specific problem areas, but it is not designed to track how responses to PMIEs change over time. Second, although betrayal is not original to the construct of moral injury as defined by Litz et al. (2009), three of the nine MIES items focus on betrayal (see also, Shay, 2014). Third, the response format on the MIES ranges from 1 = *Strongly Disagree* to 6 = *Strongly Agree*, which poses problems for interpreting responses denying PMIE exposure. For example, it is not clear how disagreement that one witnessed "things that were morally wrong" differs from strong disagreement. Our study and others have circumvented this issue by dichotomizing responses as *agree* and *disagree*. Still, future studies would benefit from more nuanced assessment of the perceived severity of PMIEs

to which individuals are exposed. Finally, the MIES was originally designed for military populations, with military-focused items that were adapted by Khan et al. (2021) and used in this study. A comprehensive measure of moral injury is needed, appropriate for use with civilians, that indexes exposure, resulting symptoms, and resulting impairment.

Another limitation is that, under different conditions, the patterns of PMIE exposure would likely differ; the classes themselves and the percentage of the sample assigned to each class might vary (e.g., when sampling clinical, rather than community, populations). Likewise, passage of time since the precipitating event occurred could impact patterns of moral injury. Other contexts to consider are differences in occupation, seniority in occupation, culture, race/ethnicity, geographic region, non-pandemic work conditions, and other types of PMIEs. Our study had a convenience sample that was not racially/ethnically diverse, was predominantly female, and lacked sufficient statistical power to examine demographic differences in classes of moral injury or psychosocial outcomes. There also may be other civilian populations in organized care settings at-risk for moral injury that should be considered in future research, such as police, border patrol, veterinarians, and educators. Furthermore, considering the implications of our findings for spiritually-integrated interventions, it is a limitation that we did not measure healthcare workers' religion or spirituality in this study. Additional work is needed to examine healthcare workers' reactions to spiritually-integrated interventions for moral injury using validated, psychometrically sound assessments of religious/spiritual constructs (e.g., spiritual fortitude) as well as broader implications such as enhancing access through implementation with healthcare chaplains.

Future Directions

As described above, future studies should examine moral injury under other conditions

and in relation to other individual outcomes (e.g., professional burnout) and organizational outcomes (e.g., turnover). Our demographic descriptive results point to potential risk factors for moral injury, namely age (being younger) and occupation (physicians vs. other care providers). While gender predicts military-related PMIE exposure (Maguen, Griffin, Copeland, Perkins, Finley, & Vogt, 2020), studies with civilians should consider gender differences, including how gender may or may not confound occupational or other contextual factors. Qualitative research could facilitate better understanding of the context of PMIE exposure, including systemic prejudice, and the types of events that are morally injurious for various civilians. Moreover, qualitative research may clarify the conceptual distinction and potentially overlapping features between moral injury, spiritual distress, and professional burnout. Furthermore, there is a need for research on the social context of moral injury, including the dynamic relationships between social support, betrayal, moral injury, and their impact on the mental and physical health of civilian frontline workers.

Moral injury should be studied with more racially/ethnically diverse samples of organized care workers, serving more diverse communities. Theory suggests systemic prejudice contributes to moral injury among racial/ethnic minorities (Sugrue, 2020). This is even more disturbing given the disproportionate impact of COVID-19 on racial/ethnic minorities, which includes higher risk of COVID-19 related illness and of mental health problems among African Americans (Bambra et al., 2020) and increased discrimination and hate crimes against Asians/Asian Americans (Jeung, 2020). Barbot (2020) conceptualized that repeated incidents of systemic racism culminate in *collective* moral injury for African Americans. Future studies should examine the role of systemic prejudice in the moral transgressions healthcare workers witness and perpetrate, as well as in their sense of betrayal by their communities, instutitions,

and government. Furthermore, culturally-based protective factors should be examined among more diverse samples of healthcare workers. These may include spiritual/religious protective factors like positive religious coping (Park et al., 2017; Zhang et al., 2021) and other factors that promote spiritual fortitude (Ada et al., 2021; Davis et al., 2021). Thus, future studies should not only examine moral injury among diverse populations, but should examine the role of risk factors (e.g., systemic prejudice) and protective factors (e.g., spiritual fortitude) for moral injury that may vary by race, ethnicity, culture, and religion.

Finally, there is a clear need to develop and test moral injury treatments for healthcare workers, such as spiritually-integrated interventions, and with culturally appropriate adaptations (Maguen & Griffin, 2022). To date, there are no empirically tested interventions designed to address moral injury in civilian frontline workers. In organized care settings such as hospitals or prisons, existing mental health and chaplaincy programs could be tapped to deliver care for moral injury. Other novel modalities of delivering moral injury care might include self-administered manuals, eHealth applications, and peer responder programs, which may be more scaleable and less susceptible to barriers such as help-seeking stigma, geographic isolation, and scheduling constraints. Furthermore, there are likely elements of moral injury that are unique to the civilian experience. Therefore, a ground-up development of moral injury interventions for civilian frontline workers may be necessary.

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Table 1. *Demographic and Occupational Characteristics Overall and by Latent Class*

	Whole Sample	Latent Class			
		Minimal Exposure	Betrayal Only	Moral Injury Other	Moral Injury Self
n	480	112	191	124	53
Sex %					
Male	18.9	20.6	22.6	12.6	17.0
Female	80.9	79.4	77.4	86.6	83.0
Other	0.2	0.0	0.0	0.8	0.0
Age *M* (years)	41.3	42.7	42.4	39.4	38.5
Age *SD* (years)	11.6	12.5	11.4	11.0	10.7
Race/Ethnicity %					
White	93.3	91.1	95.8	91.9	92.5
Black/African American	0.6	0.9	0.5	0.0	1.9
American Indian or Alaska Native	0.6	0.0	1.0	0.8	0.0
Asian	3.3	1.8	2.1	5.6	5.7
Native Hawai'ian or Pacific Islr.	0.4	0.9	0.0	0.8	0.0
Other	3.8	4.5	3.1	4.0	3.8
Hispanic/Latinx	6.3	5.4	5.2	8.9	5.7
Time in Career *M* (years)	12.1	14.3	12.4	10.2	10.5
Time in Career *SD* (years)	10.0	11.0	10.1	8.9	8.4
Role %					
Physician	12.2	7.7	17.7	8.9	8.6
Nurse	44.5	50.0	41.1	45.6	42.9
Other - Direct Patient Care	15.3	12.6	15.4	18.1	14.5
Other - No Patient Care	28.0	29.7	25.8	27.4	34.0

Note. Values given as valid percentages unless stated otherwise. Missing data by variable are as follows: gender (n = 15), age (n = 80), time in career (n = 2), and provision of patient care (n = 2).

Table 2. *Item-Level Responses to the adapted Moral Injury Events Scale (Nash et al., 2013; Khan et al., 2021)*

MIES Item	Valid percent
1. I saw things that were morally wrong.	
Agree	33.3
Disagree	66.7
2. I am troubled by having witnessed others' immoral acts.	
Agree	35.9
Disagree	64.1
3. I acted in ways that violated my own moral code or values.	
Agree	8.6
Disagree	91.4
4. I am troubled by having acted in ways that violated my moral own morals or values.	
Agree	14.9
Disagree	85.1
5. I violated my own morals by failing to do something that I felt I should have done.	
Agree	12.0
Disagree	88.0
6. I am troubled because I violated my morals by failing to do something that I felt I should have done.	
Agree	11.8
Disagree	88.2
7. I feel betrayed by leaders from the government.	
Agree	75.7
Disagree	24.3
8. I feel betrayed by other community members.	
Agree	71.5
Disagree	28.5
9. I feel betrayed by healthcare or public health organizations.	
Agree	32.2
Disagree	67.8

Note. Values given as valid percentages. Percent missing on each item was <2.0%.

Table 3. *Fit Indices for Latent Class Models of adapted MIES Items*

Model	AIC	BIC	aBIC	LRT	BLRT	Entropy	smallest class size
2-class	3,682.29	3,761.59	3,701.29	$p < .001$	$p < .001$	.872	36.4%
3-class	3,509.37	3,630.41	3,538.36	$p < .001$	$p < .001$	.887	13.1%
4-class*	3,380.40	3,543.18	3,419.40	$p < .001$	$p < .001$	.892	11.2%
5-class	3,337.54	3,542.05	3,386.53	$p = .059$	$p < .001$	.885	3.3%
6-class	3,298.15	3,544.41	3,357.15	$p = .087$	$p < .001$	.901	2.9%

Notes. AIC = Akaike's Information Criterion, BIC = Bayesian Information Criterion, aBIC = Sample Size Adjusted Bayesian Information Criterion, LRT = Lo-Mendel-Rubin Likelihood Ratio Test, and BLRT = Bootstrapped Likelihood Ratio Test.
*Best-fitting model.

Table 4.

Mean Difference in Impaired Psychosocial Functioning Comparisons by Latent Class

	Minimal Exposure		Betrayal Only		Moral Injury Other		Moral Injury Self	
	Mean	*SE*	Mean	*SE*	Mean	*SE*	Mean	*SE*
Total psychosocial impairment	17.15_a	4.24	31.05_b	2.15	35.19_b	2.50	49.66_c	3.67
Romantic Relationships	1.38_a	0.26	1.81_a	0.18	2.30_b	0.22	3.00_b	0.31
Family Relationships	0.82_a	0.17	1.60_b	0.15	1.87_b	0.20	2.60_c	0.26
Friendships and Socializing	1.29_a	0.28	2.47_b	0.17	2.54_b	0.19	3.58_c	0.24
Work	0.94_a	0.17	1.81_b	0.15	$2.23_{b,c}$	0.20	2.84_c	0.27
Personal Care	1.17_a	0.36	2.25_b	0.18	2.17_b	0.20	3.57_c	0.29

Notes. $N = 480$. Overall Wald Chi Square difference tests were all significant, $p \leq .001$. Different subscripts indicate significantly different functioning scores between classes, $p \leq .05$.

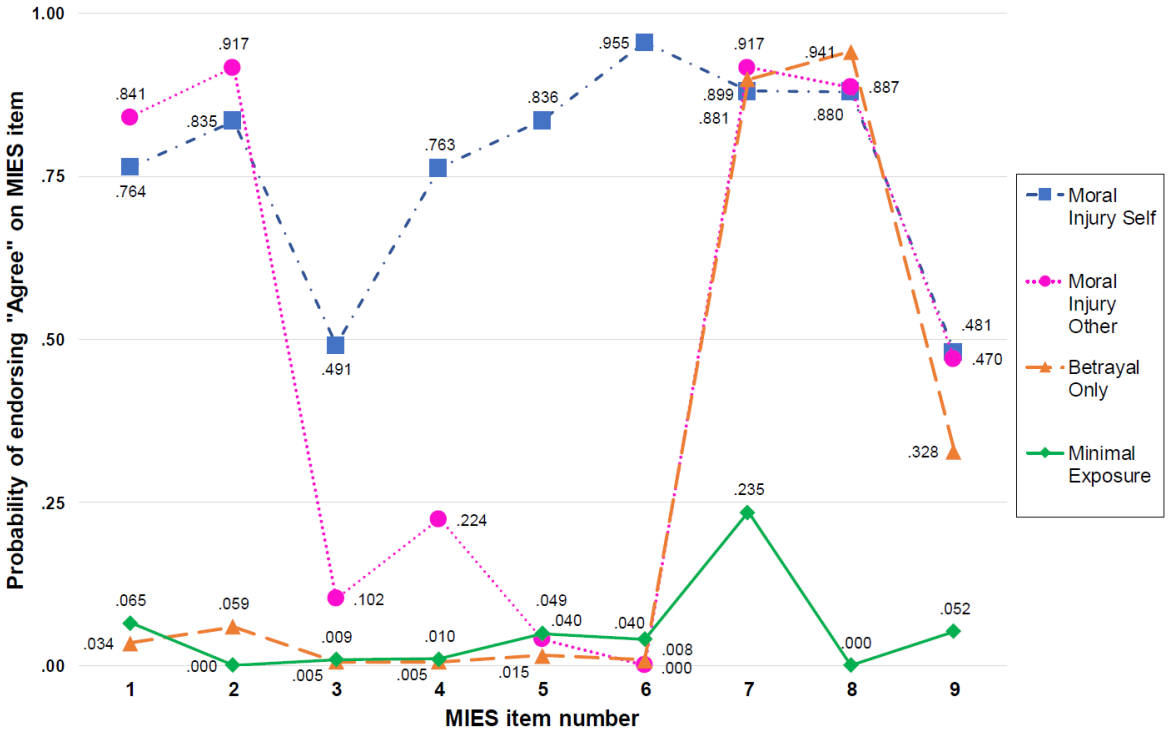

Figure 1. Latent Class Model of Moral Injury Among Healthcare Workers. “MIES item number” = responses to the adapted Moral Injury Events Scale (MIES; Nash et al., 2013; Khan et al., 2021).

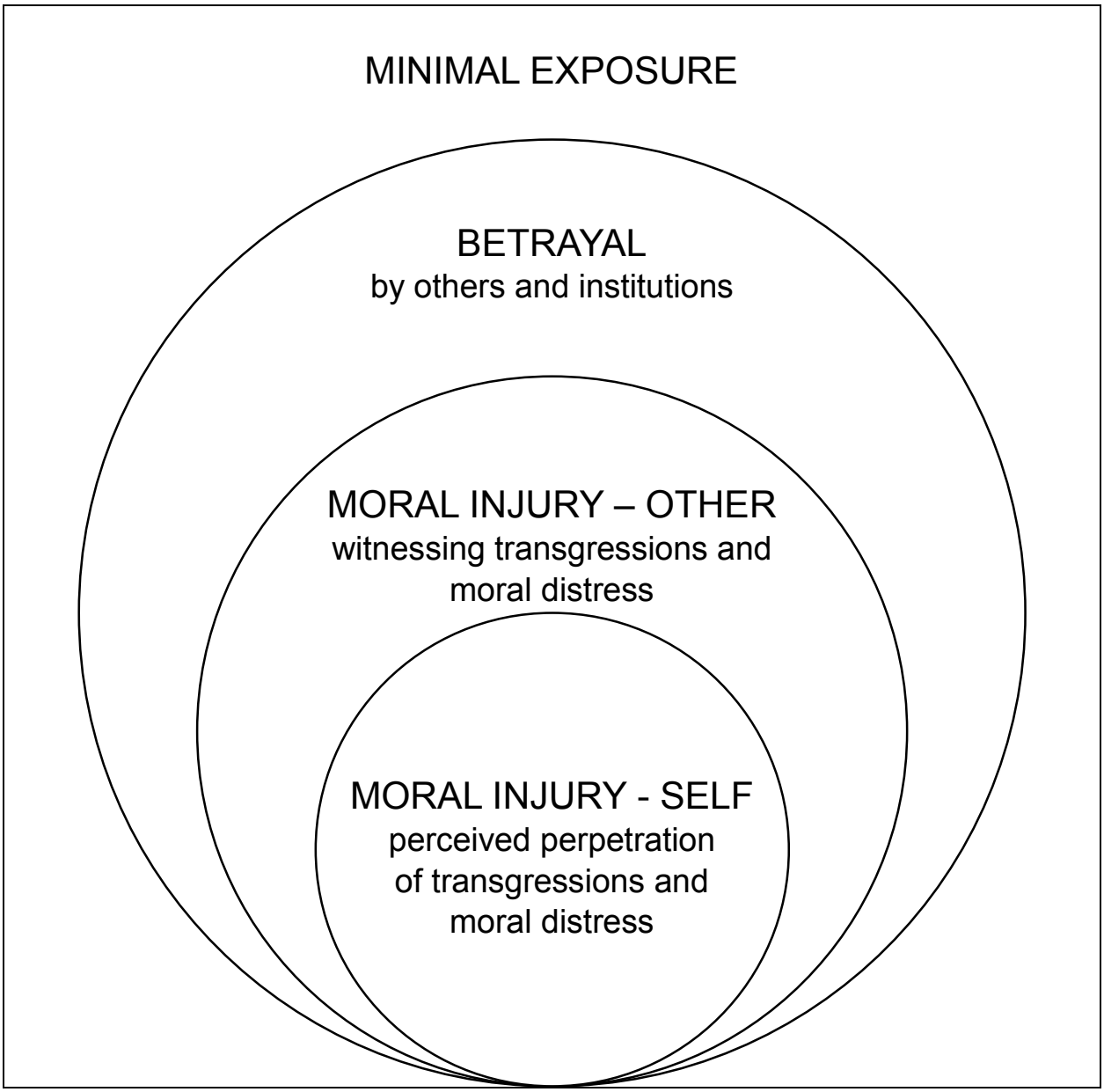

Figure 2. Conceptual model showing the nested nature of exposure to potentially morally injurious events.

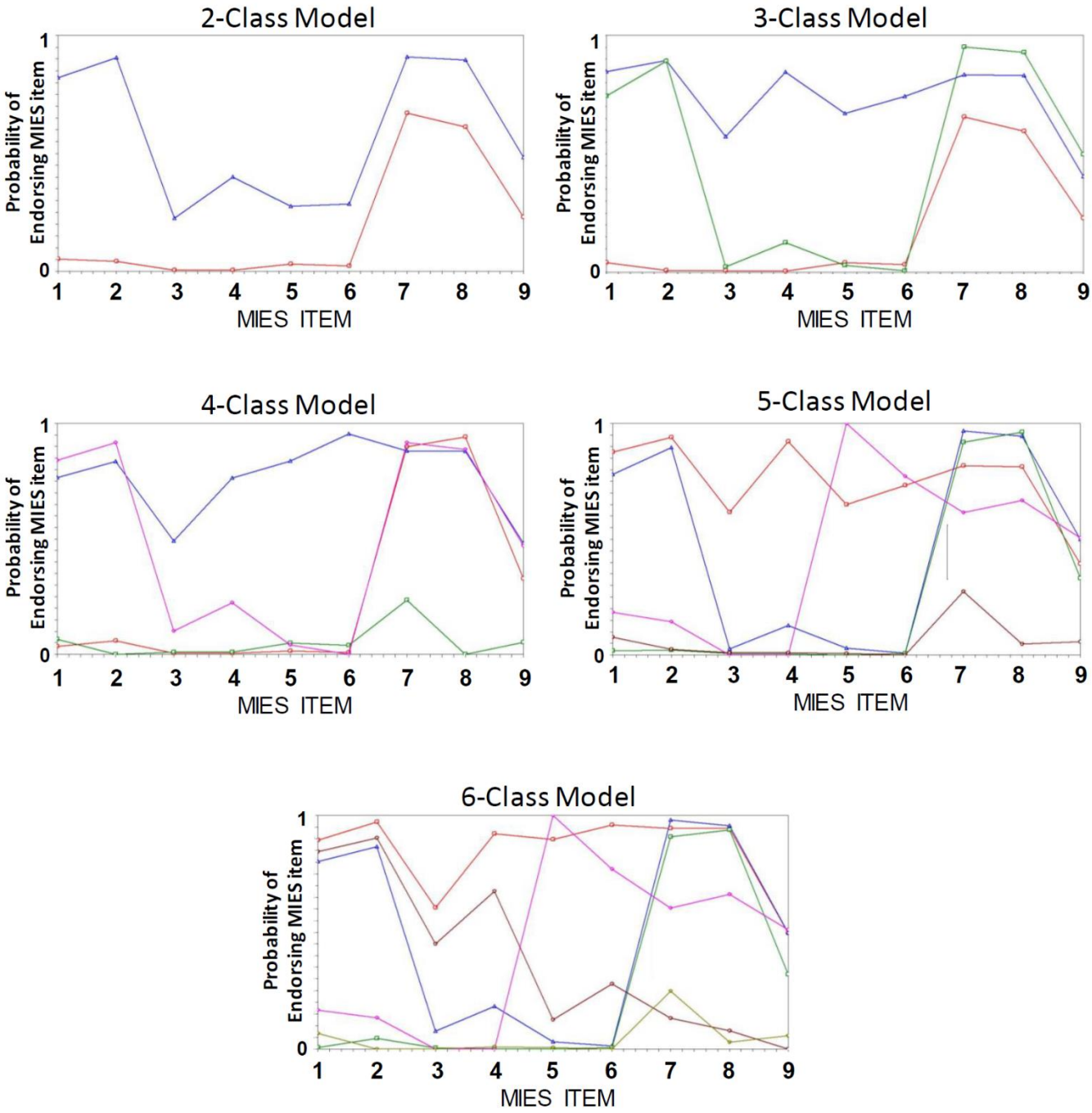

Figure S1. Latent Class Analysis models for adapted MIES items. The 4-class model was selected as the optimal model and corresponds with Figure 1.