# A. COVER PAGE

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| **Project Title:** Moral Injury Among Healthcare Workers on the Frontlines of the COVID-19 Crisis: Developing a Blueprint for Awareness, Prevention, and Mitigation | |
| **Grant Number:** 5R21OH012201-02 | **Project/Grant Period:** 09/01/2021 - 08/31/2023 |
| **Reporting Period:** 09/01/2022 - 08/31/2023 | **Requested Budget Period:** 09/01/2022 - 08/31/2023 |
| **Report Term Frequency:** Final | **Date Submitted:** 07/09/2024 |
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| **Human Subjects:** NA | **Vertebrate Animals:** NA |
| **hESC:** No | **Inventions/Patents:** No |

# B. ACCOMPLISHMENTS

**B.1 WHAT ARE THE MAJOR GOALS OF THE PROJECT?**

The specific objectives of this study were to:
o Assess COVID-19-related moral injury in a high-risk population of healthcare workers, including (a) prevalence, (b) impact, and (c) risk and protective factors at both individual and organizational levels.
o Use our findings to inform development of a testable Blueprint for Moral Injury Awareness, Prevention, and Mitigation in Healthcare Organizations, assess its acceptability/feasibility, and refine it with feedback
from organizational stakeholders.
We successfully achieved both of these objectives.

**B.1.a Have the major goals changed since the initial competing award or previous report?**

No

**B.2 WHAT WAS ACCOMPLISHED UNDER THESE GOALS?**

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**B.3 COMPETITIVE REVISIONS/ADMINISTRATIVE SUPPLEMENTS**

**For this reporting period, is there one or more Revision/Supplement associated with this award for which reporting is required?**

No

**B.4 WHAT OPPORTUNITIES FOR TRAINING AND PROFESSIONAL DEVELOPMENT HAS THE PROJECT PROVIDED?**

NOTHING TO REPORT

**B.5 HOW HAVE THE RESULTS BEEN DISSEMINATED TO COMMUNITIES OF INTEREST?**

Study findings were shared with the leaders of participating VA facilities and with national VA union leaders at multiple timepoints during the project, including:
- Upon completion of data collection: disseminated basic descriptive reports for individual facilities and for participating facilities in aggregate, invited questions and comments.
- Upon preparing an initial draft of the blueprint: disseminated the first draft and invited questions, comments, and nominations for focus group participants to allow both formal and informal feedback.
- Upon publishing a final version of the blueprint: disseminated link to final report with invitation to share widely.

In addition, we shared study findings and a link to the Blueprint with our operational partners at VA's Office of Patient Centered Care and Cultural Transformation. The Blueprint was also shared with leaders of VA's National Center for Organizational Development and VA's REBOOT initiative to improve the employee experience.

Finally, study findings and the Blueprint were shared via email with all survey participants who shared their contact information to receive study findings; with all participants who completed qualitative interviews; and with all focus group participants.

**B.6 WHAT DO YOU PLAN TO DO DURING THE NEXT REPORTING PERIOD TO ACCOMPLISH THE GOALS?**

Not Applicable

**CDC Final Report**

**B.2 What was accomplished under the goals?** For this reporting period describe:

- Major activities

Major activities undertaken during the reporting period include:

- Completed survey of frontline VA healthcare workers caring for patients during the COVID-19 Crisis (2,810 surveys were returned; 2,004 had complete data and were included in final analysis)
- Completed Survey Data Analysis, including preparing descriptive statistics and generalized linear mixed models for primary and secondary outcomes.
- Completed qualitative interviews with a purposive sample of surveyed frontline workers caring for patients during the COVID crisis (n=46).
- Completed qualitative data analysis using rapid analysis procedures.
- Synthesized, translated, and interpretated data to draft a public facing "Blueprint" for moral injury awareness.
- Conducted EBQI focus groups (n=20 participants across 5 focus groups) to gather feedback on the drafted Blueprint.
- Revised, refined, and published the Blueprint, which includes actionable, evidence-informed guidelines to help healthcare organizations reduce risk for moral injury among healthcare workers.

- Specific Objectives

  - The specific objectives of this study were to:
    - Assess COVID-19-related moral injury in a high-risk population of healthcare workers, including (a) prevalence, (b) impact, and (c) risk and protective factors at both individual and organizational levels.
    - Use our findings to inform development of a testable Blueprint for Moral Injury Awareness, Prevention, and Mitigation in Healthcare Organizations, assess its acceptability/feasibility, and refine it with feedback from organizational stakeholders.
  - We successfully achieved both of these objectives.

- Significant results (including ) major findings, developments, or conclusions (both positive and negative)

Complete data were obtained for 2,004 survey participants and 46 qualitative interview participants who were included in the final analysis. Findings are summarized here for each of three primary research questions: (A) "Which healthcare workers and settings are at higher risk for moral injury?", (B) "What experiences or events contribute to moral injury?", and (C) "What workplace conditions make moral injury more or less likely?". Section A summarizes survey and administrative data findings. Sections B and C focus primarily on qualitative interview themes. Following the description of each theme in Sections B and C, closely related quantitative findings are also highlighted to support an integrated understanding of potential contributors to

moral injury in the healthcare workplace. Findings related to secondary outcomes are presented in a final, separate section entitled, "Posttraumatic Stress, Depression, and Burnout."

A. Which healthcare workers and settings are at higher risk for moral injury?

Overall, 39% (773) of workers met our threshold for positive MIES screen and were therefore considered at risk for moral injury. This included 41% (656) of all workers from targeted work locations hypothesized to be at higher risk and 29% (117) from other work locations (e.g., outpatient units). Across work locations, 30% (594) felt betrayed by healthcare leaders, coworkers, or others (at risk for betrayal-based moral injury), 22% (441) were distressed by witnessing others' unethical actions (at risk for witnessing-based moral injury), and 10% (194) felt they committed unethical actions or failed to take an ethical action they should have taken (at risk for perpetration-based moral injury).

Registered nurses (RNs) screened positive on the MIES at higher rates than other occupations, with 43% (477) at risk for moral injury compared to 39% (25) of nurse practitioners and physicians' assistants, 37% (63) of respiratory therapists and hands-on care providers not otherwise specified, 34% (115) of LPNs, LVNs, and nursing assistants, 31% (64) of physicians, 26% (20) of administrative and clerical workers, and 21% (9) of psychologists and social workers.

Moral injury risk was significantly associated with age, with a stepwise linear decrease in moral injury risk with each increase in age category: 53% (56) of the youngest workers screened positive on the MIES compared to 24% (67) of the oldest workers. Relative to workers over 60, workers under 29 were more than twice as likely to be at risk for moral injury in unadjusted analyses (RR=2.22 [1.69- 2.92] p<0.001).

Significant covariates retained in the final generalized linear mixed model included management health and safety support, supervisor support, coworker support, decision empowerment, denial of family visits, short-staffing, and work-family conflict. (See Table 1) Occupation was no longer a significant predictor of moral injury risk after adjusting for other covariates. Age retained significance, but the addition of age and other intrinsic factors decreased model fit.

When analyses were stratified by work locations hypothesized to be high-risk versus all other locations, results were very similar. Compared to participants in high-risk locations, participants in other locations reported fewer and less severe exposures to covariate risk factors and fewer positive MIES screens; however, observed associations between covariates and moral injury risk remained consistent throughout all work locations.

Table 1 displays the final generalized linear mixed models for moral injury risk.

**Table 1: Moral injury – adjusted analyses (generalized linear models)**

| | Without Intrinsic Factors | | With Intrinsic Factors | |
|---|---|---|---|---|
| | ARR (95% CI) | *p* | ARR (95% CI) | *p* |
| Management health & safety support | | | | |
| Strongly agree | 1.00 (reference) | | 1.00 (reference) | |
| Agree | 1.50 (1.09,2.06) | 0.014 | 1.47 (1.05,2.06) | 0.026 |
| Neutral | 1.86 (1.29,2.69) | <0.001 | 1.81 (1.24,2.65) | 0.002 |
| Disagree | 2.47 (1.72,3.54) | <0.001 | 2.40 (1.66,3.47) | <0.001 |
| Strongly disagree | 2.70 (1.90,3.83) | <0.001 | 2.61 (1.82,3.76) | <0.001 |
| Supervisor support | | | | |
| Helpful | 1.00 (reference) | | 1.00 (reference) | |
| Not helpful | 1.15 (1.02,1.29) | 0.026 | 1.13 (1.01,1.28) | 0.040 |
| Coworker support | | | | |

| | | | | |
|---|---|---|---|---|
| Can be relied on | 1.00 (reference) | | 1.00 (reference) | |
| Can not be relied on | 1.18 (1.06,1.33) | 0.004 | 1.19 (1.07,1.33) | 0.002 |
| Decision empowerment | | | | |
| Neutral to strongly agree | 1.00 (reference) | | 1.00 (reference) | |
| Disagree | 1.11 (0.99,1.23) | 0.062 | 1.12 (1.00,1.25) | 0.044 |
| Strongly disagree | 1.24 (1.06,1.44) | 0.006 | 1.28 (1.09,1.49) | 0.002 |
| Patient deaths | | | | |
| Never | 1.00 (reference) | | 1.00 (reference) | |
| 1-2 times | 1.04 (0.82,1.32) | 0.759 | 1.03 (0.82,1.29) | 0.820 |
| 3 or more times | 1.28 (1.09,1.50) | 0.002 | 1.26 (1.08,1.47) | 0.004 |
| Denial of family visits | | | | |
| 0 - 4 times | 1.00 (reference) | | 1.00 (reference) | |
| 5 or more times | 1.21 (1.12,1.31) | <0.001 | 1.19 (1.10,1.30) | <0.001 |
| Short-staffing | | | | |
| 2 months or less | 1.00 (reference) | | 1.00 (reference) | |
| 3 months or longer | 1.62 (1.36,1.92) | <0.001 | 1.58 (1.35,1.86) | <0.001 |
| Work-family conflict | | | | |
| Never to sometimes | 1.00 (reference) | | 1.00 (reference) | |
| Often or most of the time | 1.59 (1.37,1.83) | <0.001 | 1.56 (1.35,1.81) | <0.001 |
| Age | | | | |
| 29 and under | | | 1.33 (1.01,1.74) | 0.039 |
| 30-39 | | | 1.33 (1.06,1.67) | 0.015 |
| 40-49 | | | 1.17 (0.96,1.42) | 0.114 |
| 50-59 | | | 1.14 (0.95,1.38) | 0.168 |
| 60 years or older | | | 1.00 (reference) | |
| Occupation | | | | |
| Registered nurse | | | 1.00 (reference) | |
| LPN/LVN or nursing assistant | | | 0.94 (0.82,1.08) | 0.365 |
| Nurse practitioner or physician assistant | | | 1.11 (0.85,1.44) | 0.444 |
| Physician | | | 1.06 (0.84,1.34) | 0.634 |
| Psychologist or social worker | | | 0.62 (0.38,1.01) | 0.054 |
| Other hands-on patient care | | | 1.00 (0.87,1.15) | 0.953 |
| Admin in clinical area, housekeeping, or other | | | 1.02 (0.73,1.43) | 0.898 |
| Supervisor status | | | | |
| Non-supervisor | | | 1.00 (reference) | |
| Supervisor | | | 1.03 (0.85,1.26) | 0.750 |
| Gender | | | | |
| Man | | | 1.00 (reference) | |
| Woman, other, non-binary | | | 1.05 (0.92,1.21) | 0.467 |
| Race and ethnic minority | | | | |
| White | | | 1.00 (reference) | |
| Other race/ethnic minority | | | 0.98 (0.87,1.10) | 0.700 |
| Bayesian Information Criterion (BIC) | | 2779.7 | 2862.7 | |

A separate analysis of facility-level risk did not yield consistent relationships between moral injury risk and care quality, patient safety, patient satisfaction, or staff satisfaction (Table 5). Regarding care quality, facilities that performed more poorly on the Acute Care Standardized 30-day Mortality Ratio (SMR30) had moderately increased rates of positive MIES screen relative to facilities in the top quartile of performers (RR=1.26, p=0.002 for third-quartile facilities; RR=1.29, p=0.002 for fourth-quartile facilities). However, similar trends were not observed in other metrics assessing care quality or patient safety. Findings were similarly inconsistent for facility-level measures of employee satisfaction and patient satisfaction: either the relationships that appeared statistically significant did not yield consistent patterns across quartiles, or apparent patterns were discordant across different measures of the same construct.

Of all facility-level metrics, the SMR30 yielded the strongest indication of a potential relationship to moral injury. Therefore, we conducted a sensitivity analysis to determine how its addition to the moral injury model would impact fit. We found that it decreased model fit.

B. What experiences or events contribute to moral injury?

*Institutional Betrayal.*

Interviewed workers described feeling betrayed and abandoned by healthcare leaders and managers as an important risk factor for moral injury. This occurred when leaders' decisions, actions, and/or inactions were seen as causing harm to the participants, their coworkers, and/or their patients. Examples included leaders' failing to listen to and learn about the resource and staffing needs of frontline staff, failing to be visible to or present with frontline staff during the pandemic, or establishing policies and procedures that impacted working conditions or patient care without adequately consulting frontline staff.

This betrayal was felt most acutely when it negatively impacted patient care. In the words of an ICU RN, "I was desperately trying to do what I felt was right and best for my patients and not only did I feel unheard and unvalued by my leadership, but I felt handicapped by them, and I think that was particularly difficult… It felt like… my coworkers and I were betrayed and abandoned and left to [do] more with less and less." Another inpatient RN said, "We felt like we were left to our own devices…. We got a lot of lip service and no actual action… It's demoralizing and it's disheartening."

This qualitative theme aligns with survey data, where 30% of respondents endorsed two or more items in the betrayal domain of the MIES. Notably, one of the strongest predictors of moral injury risk was perceived management support for workplace health and safety. Surveyed workers who strongly disagreed with the statement that "management considers workplace health and safety to be important" were greater than five times more likely to be at risk for moral injury compared to those who strongly agreed. In the final model, the adjusted relative risk (the contribution of this covariate over and above the contribution of all others in the model) was 2.70 ($p<0.001$).

*Values-Policy Conflict.*

Interviewed workers described following hospital policies that violated their own values as a significant contributor to moral injury. The most common example of this was enforcing rules requiring isolation of critically ill patients from loved ones or long-term isolation of nursing home residents from families. For example, an inpatient nurse practitioner found it extremely distressing when she was unable to allow a dying patient time with their young child: "We had a family member who had a 4-year old. This patient was dying and they wanted to see their baby one last time… They couldn't see him, was the bottom line, they couldn't see him." Similarly, an ICU RN described the moral distress created by pandemic-era visitation restrictions: "We were taking care of them and they were dying without their family…. After they're dead, they're dead, and those policies I felt were wrong… That family member, if they want to suit up and wear the same protective gear that we have to wear… they should be given that choice."

Survey data showed a significant correlation between moral injury risk and denial of family visits to critically ill patients. Workers who denied family visits to critically ill patients more than four times were 73% more likely to be at risk for moral injury than those who did not deny family visits. In the final model, the adjusted relative risk was 1.21 ($p<0.001$).

*Compromised Care Quality.*

Interviewed workers experienced intense moral distress when they felt unable to provide the standard of care that patients deserved due to inadequate staffing and inadequate time to spend with each patient, or due to lack of needed supplies and resources (e.g., personal protective equipment). An emergency room nurse described feeling distress at “watching these people just be stranded or stuck in an emergency department” when the facility ran out of beds: “sometimes, just to get them moved, people would place them in the wrong level of care.” An ICU nurse felt intense moral conflict due to short-staffing in her department that prevented her from monitoring intubated COVID-19 patients with the frequency she felt was required: “We were expected to monitor those patients like once every four hours. And that felt extremely uncomfortable… You can’t appropriately paralyze somebody and not check them in four hours… They couldn’t protect themselves, you couldn’t protect them, that just wasn’t safe.”

This qualitative theme aligns with survey findings, which showed a significant correlation between moral injury risk and duration of short-staffing during the pandemic. Workers who reported that their team lacked personnel required for patient care for three months or longer were more than twice as likely to be at risk for moral injury compared to those who reported more transient short-staffing. In the final model, the adjusted relative risk was 1.62 ($p<0.001$).

*Powerlessness to Mitigate Suffering.*

Interviewed workers described feeling powerless to help dying patients as a significant contributor to moral injury: "We're losing people left and right, and there's nothing we can do.” An ICU RN acknowledged “the distress of knowing with almost certainty that every patient you cared for was probably going to die…. I remember experiencing a significant amount of moral and ethical conflict.” Interviewees’ distress was particularly acute when their patients were suffering. They felt that patients were relying on them and yet they could not deliver care that would mitigate their suffering or prevent their deaths. “When the patients are asking you to save them… that's the most distressing part,” explained another ICU RN.

This qualitative theme aligns with and helps to explain survey findings, which showed a significant correlation between moral injury risk and the deaths of patients under one’s care during the COVID-19 pandemic. Workers who cared for three or more COVID-19 patients who died were 89% more likely to be at risk for moral injury than those who did not experience a patient death from COVID-19. In the final model, the adjusted relative risk was 1.28 ($p=0.002$).

Yet, interviews suggested that not all deaths were equal in the eyes of healthcare workers; some were far more distressing than others, and many interviewees described at least one patient loss that haunted them. Failure to provide patients a death with dignity or to pause and honor those who died could be especially distressing. An LVN, for example, was deeply troubled that, when “your patient dies… you just got to throw ‘em in a body bag and clean the room and there’s another one waiting in the ER for the bed.”

*Work-Family Conflict.*

Interviewed workers felt that conflicts between their duties at work and their obligations to family and loved ones contributed to moral injury. Especially during the COVID-19 pandemic, workers feared putting their own family at risk of contagious illness. An inpatient nurse explained, "We all understood that, on the one hand, we wanted to take care of patients like we always had… One part of our mind was focused on the job…. Another part of our mind, for every nurse I know, was also worried about 'what if I bring this home' to whoever was their

special immunocompromised person... Every single person had somebody in their circle they were especially worried about bringing it home to."

Interviewed workers also reported moral distress related to neglecting the needs of loved ones because work demanded all of their time and energy. They felt they had nothing left to give at home. Another inpatient RN shared that her “parenting was severely affected… I just wanted to be in my room when I wasn't at work… I'm just exhausted and mentally not there.”

This qualitative theme aligns with survey findings, which showed a significant correlation between moral injury risk and work-family conflict. Workers who reported experiencing conflict most or all of the time were more than twice as likely to be at risk for moral injury than those who reported less frequent work-family conflict. In the final model, the adjusted relative risk was 1.59 ($p<0.001$).

*Futile Care.*

A significant source of moral injury described by interviewees was feeling bound to deliver care that is futile and causes suffering. This happened often in the context of COVID-19 care but was relevant in other contexts as well. “It was really hard to watch painful procedures, painful care be done to people in the name of 'oh, well maybe we can get them better,'” shared an ICU RN, “The futile care was something I really struggled with.” Another ICU RN who cared for COVID-19 patients said she “felt like [we] were torturing them [patients] by proning them, then being on blood pressure medication and being intubated and sedated for more than two weeks and we knew the patient wasn't going to be able to come off the ventilator.” The word “torture” was used by multiple interviewees in the context of delivering futile care: “At a certain point, you're just literally torturing them and you're a part of that. Emotionally, it was draining, still is to this day,” shared a respiratory therapist.

There were no survey questions linked with this theme, but it emerged during qualitative interviews as a novel theme and a significant contributor to moral injury.

*Communication Failures.*

A related source of moral injury involved high-stakes provider-family communication failures. Specifically, interviewees reported feeling distressed that patients with dire prognoses and their families were sometimes not adequately and honestly informed of those prognoses. They felt that false hope affected their treatment decisions and that healthcare providers were not always doing enough to deliver difficult-to-hear, honest information. An ICU RN described the case of a COVID-19 patient she cared for: “Those two docs, the first time they saw him, knew there's no chance. But we, for three and a half months, we had this guy, our doc could never tell her there's no chance… It's just wrong, it's torture.” Another ICU RN was similarly distressed at these communication failures: “When you go to work, you feel like you're failing families because they're not being cared for or told information that you would want to know.”

Again, there were no survey questions linked with this theme, but it emerged during qualitative interviews as a novel theme and a significant contributor to moral injury.

C. What workplace conditions make moral injury more or less likely?

*Community versus Isolation.*

Across interviews, participants felt that the presence of a supportive workplace community provided some protection against moral injury. When distressing events were not faced alone and responsibility was meaningfully shared, workers felt that morally distressing events were less

likely to happen or less likely to result in lasting moral injury. By contrast, there was little buffer against moral injury where there was lack of community, connection, and belonging – where, instead, individuals felt alienated from others and burdened by responsibility. A morally injured inpatient RN described "feeling like left-overs… Nobody wants to come to us, but we have to show up every time and do the job." Another RN lamented that "nobody came to talk to us to make sure that we were mentally okay."

This qualitative theme aligns with survey findings, which showed a significant correlation between moral injury risk and perceived coworker support. Workers who reported that their co-workers could not be relied on to help were 59% more likely to be at risk for moral injury compared to those who reported that they could rely on their co-workers. In the adjusted model, the relative risk was 1.18 (p=0.004).

*Responsible versus Absent Leaders.*

Interviewees felt that moral injury was less likely when leaders, managers, and decision-makers were present and in communication with those on the frontlines. They emphasized the importance of meaningful communication in both directions so frontline workers feel genuinely heard and appreciated. When leaders, managers and decision-makers seemed disengaged from the frontlines, interviewees described feeling greater and more frequent moral distress. This was particularly true when leaders lacked understanding of the experiences of workers and made important decisions without listening carefully for their input. Unfortunately, this was a common experience. One ICU RN shared, "My manager was not really there. She was not involved, she did not glove up, put PPE on, and actually work. She has not actually stepped into a COVID room but yet she's representing her staff and she has no idea what she's asking her staff to do." Similarly, an ER physician explained that his feelings of betrayal would have been eased "if they [hospital leaders] would appear to understand how hard this has been for us, or acknowledge that…but, like I said, we don't see them."

In alignment with this qualitative theme, survey data showed a significant correlation between moral injury risk and perceived supervisor support. Workers who disagreed that their supervisors were helpful in getting the job done were twice as likely to be at risk for moral injury compared to those who agreed. In the final model, the adjusted relative risk was 1.15 (p=0.026).

*Empowered versus Powerless Workers.*

When interviewees saw that it was possible to make meaningful changes to their workplace and to address the factors that caused moral distress, they experienced this as a mitigating factor that could reduce moral injury risk. By contrast, workers' distress and frustration were amplified when they lacked agency to improve the situation or to do things differently in the future. For example, a respiratory therapist explained that his own distress would have been alleviated "if management had only asked… 'what could be learned from this, what could be changed?'" But this did not happen.

This qualitative theme helps to explain survey findings, which showed a significant correlation between moral injury risk and perceived empowerment in the workplace. Workers who strongly disagreed they had the authority to make decisions that impacted them at work were more than twice as likely to be at risk for moral injury than those who agreed or responded neutrally. In the final model, the adjusted relative risk was 1.24 (p=0.006).

*Processing versus Suppressing.*

Across interviews, the presence of meaningful breaks that allowed for reflection and recovery was identified as a factor that could provide some protection against moral injury. Workers felt that morally distressing events were less likely to result in lasting moral injury when there was time to pause and opportunity to process and discuss these events. Morally injured workers described feeling compelled to ignore or suppress their feelings so they could continue to operate under high-stress conditions. For them, this could feel unrealistic and inhumane. One ICU RN shared, "I took care of [Tom] for four weeks. I took care of [Chris] for two weeks. I took care of [Steve] for three weeks. I took care of [Andy] for four. You don't get to take care of these people every day and then put them in body bags and it doesn't impact you." Those losses, she felt, had to be acknowledged and grieved.

There were no survey questions linked with this theme, but it emerged during qualitative interviews as a novel theme and a notable factor impacting moral injury risk.

*Shared Risk versus Uneven Burdens.*

Although different jobs carry different risks and burdens, interviewed workers appreciated it when the organization made an effort to share the heaviest burdens, meaningfully acknowledge workers who carried more than their share of burden, and take action to make things more balanced when there were pronounced inequities. By contrast, interviewees felt that moral injury was more likely when certain workers were consistently asked to bear a disproportionate share of workplace risk and burden over a long period of time. A common example was the routine delegation of inpatient COVID-19 care to a very small number of nurses in order to protect other employees from any contact with COVID-19 inpatients. "We bore the brunt of this pandemic," shared an exhausted inpatient nurse. Workers also felt frustrated and betrayed when their sacrifices were acknowledged in only superficial ways and there were no meaningful efforts to ensure a fairer distribution of risk and burden. An emergency room nurse described feeling "abandonment by higher up people."

There were no survey questions linked with this theme, but it emerged during qualitative interviews as a novel theme and a notable factor impacting moral injury risk.

Posttraumatic Stress, Depression, and Burnout

As reported in Table 8, 41% (818) of surveyed workers screened positive for posttraumatic stress risk, 27% (545) for depression risk, and 25% (503) for persistent burnout risk. Compared to workers *not* at risk for moral injury, workers who were at risk for moral injury were more than twice as likely to be at risk for posttraumatic stress (RR=2.10 [1.89-2.33), p=<0.001) and depression (RR=2.08 [1.80-2.40], p<0.001), and more than three times as likely to screen positive for persistent burnout (RR=3.20 [2.72, 3.77], p<0.001). Correlation coefficients between moral injury and secondary outcomes, which ranged from weak to moderate, are presented in Table 9.

In GLMs, relationships between secondary outcomes and covariates of interest were similar to those identified for moral injury but did not always reach statistical significance (Tables 10 and 11). After adjustments, management health and safety support, short-staffing, and work-family conflict were significant predictors of posttraumatic stress, depression, and burnout. Coworker support and decision empowerment were significant predictors of positive depression and burnout screens. Patient deaths and denial of family visits were significant predictors of positive posttraumatic stress screen.

Table 2 presents the generalized linear mixed models for PTSD, depression, and burnout.

**Table 2: PTSD, depression, and burnout – adjusted analyses without intrinsic factors**

| | PTSD | | Depression | | Burnout | |
|---|---|---|---|---|---|---|
| | ARR (95% CI) | *p* | ARR (95% CI) | *p* | ARR (95% CI) | *p* |
| Management health & safety support | | | | | | |
| Strongly agree | 1.00 (reference) | | 1.00 (reference) | | 1.00 (reference) | |
| Agree | 1.12 (0.93,1.36) | 0.229 | 1.06 (0.74,1.52) | 0.756 | 1.23 (0.84,1.81) | 0.294 |
| Neutral | 1.38 (1.13,1.70) | 0.002 | 1.30 (0.86,1.96) | 0.207 | 1.59 (1.11,2.28) | 0.012 |
| Disagree | 1.65 (1.29,2.12) | <0.001 | 1.39 (1.02,1.91) | 0.040 | 1.77 (1.20,2.61) | 0.004 |
| Strongly disagree | 1.58 (1.26,1.98) | <0.001 | 1.65 (1.06,2.57) | 0.026 | 2.17 (1.41,3.35) | <0.001 |
| Supervisor support | | | | | | |
| Helpful | 1.00 (reference) | | 1.00 (reference) | | 1.00 (reference) | |
| Not helpful | 0.97 (0.88,1.08) | 0.636 | 0.90 (0.77,1.04) | 0.153 | 1.18 (0.99,1.41) | 0.062 |
| Coworker support | | | | | | |
| Can be relied on | 1.00 (reference) | | 1.00 (reference) | | 1.00 (reference) | |
| Can not be relied on | 1.08 (0.99,1.17) | 0.082 | 1.19 (1.08,1.32) | <0.001 | 1.20 (1.03,1.39) | 0.017 |
| Decision empowerment | | | | | | |
| Neutral to strongly agree | 1.00 (reference) | | 1.00 (reference) | | 1.00 (reference) | |
| Disagree | 1.04 (0.93,1.16) | 0.491 | 1.28 (1.12,1.45) | <0.001 | 1.53 (1.38,1.70) | <0.001 |
| Strongly disagree | 1.02 (0.91,1.14) | 0.763 | 1.31 (1.07,1.59) | 0.009 | 1.63 (1.36,1.95) | <0.001 |
| Patient deaths | | | | | | |
| Never | 1.00 (reference) | | 1.00 (reference) | | 1.00 (reference) | |
| 1-2 times | 1.39 (1.17,1.64) | <0.001 | 0.81 (0.66,1.00) | 0.049 | 0.97 (0.87,1.09) | 0.615 |
| 3 or more times | 1.83 (1.63,2.06) | <0.001 | 0.89 (0.75,1.06) | 0.186 | 1.09 (0.89,1.33) | 0.397 |
| Denial of family visits | | | | | | |
| 0 - 4 times | 1.00 (reference) | | 1.00 (reference) | | 1.00 (reference) | |
| 5 or more times | 1.15 (1.01,1.32) | 0.042 | 0.96 (0.85,1.09) | 0.527 | 0.99 (0.82,1.20) | 0.942 |
| Short-staffing | | | | | | |
| 2 months or less | 1.00 (reference) | | 1.00 (reference) | | 1.00 (reference) | |
| 3 months or longer | 1.18 (1.06,1.32) | 0.002 | 1.20 (1.02,1.42) | 0.026 | 1.50 (1.29,1.76) | <0.001 |
| Work-family conflict | | | | | | |
| Never to sometimes | 1.00 (reference) | | 1.00 (reference) | | 1.00 (reference) | |
| Often or most of the time | 1.84 (1.56,2.17) | <0.001 | 3.12 (2.19,4.46) | <0.001 | 3.28 (2.51,4.28) | <0.001 |

- key outcomes or other achievements
  Include a discussion of stated goals not met. As the project progresses, the emphasis in reporting in this section should shift from reporting activities to reporting accomplishments.

All project goals were met and objectives achieved. In addition to preparing a formal manuscript presenting research findings, a key outcomes/achievement was the development of a Blueprint with evidence-informed guidance for healthcare leaders to aid them in the prevention of moral injury. This Blueprint was drafted based on study findings, refined in focus groups with stakeholders, and finally published and disseminated in partnership with UCSF. It can be found at:

Purcell, N., Bertenthal, D., Usman, H., Maguen, S., Griffin, B., Mehlman, H., McGrath, S., Spetz, J., Hysong, S., & Seal, Karen. (2024). Moral Injury Awareness and Prevention in Healthcare Organizations: A Blueprint Informed by the COVID-19 Pandemic. Healthforce Center at UCSF. https://healthforce.ucsf.edu/publications/moral-injury-awareness-and-prevention-healthcare-organizations-blueprint-informed-covid

# C. PRODUCTS

**C.1 PUBLICATIONS**

**Are there publications or manuscripts accepted for publication in a journal or other publication (e.g., book, one-time publication, monograph) during the reporting period resulting directly from this award?**

No

**C.2 WEBSITE(S) OR OTHER INTERNET SITE(S)**

NOTHING TO REPORT

**C.3 TECHNOLOGIES OR TECHNIQUES**

NOTHING TO REPORT

**C.4 INVENTIONS, PATENT APPLICATIONS, AND/OR LICENSES**

**Have inventions, patent applications and/or licenses resulted from the award during the reporting period?** No

**If yes, has this information been previously provided to the PHS or to the official responsible for patent matters at the grantee organization?** No

**C.5 OTHER PRODUCTS AND RESOURCE SHARING**

| Category | Explanation |
|---|---|
| Other | We currently have a mixed-methods manuscript under review at PLOS Mental Health.<br>We have also published a public-facing blueprint as follows:<br><br>Purcell, N., Bertenthal, D., Usman, H., Maguen, S., Griffin, B., Mehlman, H., McGrath, S., Spetz, J., Hysong, S., & Seal, Karen. (2024). Moral Injury Awareness and Prevention in Healthcare Organizations: A Blueprint Informed by the COVID-19 Pandemic. Healthforce Center at UCSF. https://healthforce.ucsf.edu/publications/moral-injury-awareness-and-prevention-healthcare-organizations-blueprint-informed-covid |

# D. PARTICIPANTS

## D.1 WHAT INDIVIDUALS HAVE WORKED ON THE PROJECT?

| Commons ID | S/K | Name | Degree(s) | Role | Cal | Aca | Sum | Foreign Org | Country | SS |
|---|---|---|---|---|---|---|---|---|---|---|
| NJPURCELL | Y | Purcell, Natalie J | AB,MPA,MA,PHD | PD/PI | 4.2 | 0.0 | 0.0 | | | NA |
| KASEAL | N | Seal, Karen H | MPH,MD,BS | Co-Investigator | 0.6 | 0.0 | 0.0 | | | NA |
| SPETZJO | N | Spetz, Joanne E. | PHD | Co-Investigator | 0.3 | 0.0 | 0.0 | | | NA |
| SJHYSONG | N | Hysong, Sylvia J. | BA,MA,PHD | Co-Investigator | 0.3 | 0.0 | 0.0 | | | NA |
| SMAGUEN | N | Maguen, Shira | PHD | Co-Investigator | 0.2 | 0.0 | 0.0 | | | NA |
| | N | Usman, Hajra | | Research Associate | 5.6 | 0.0 | 0.0 | | | NA |
| | N | Bertenthal, Daniel | | Data Analyst | 1.2 | 0.0 | 0.0 | | | NA |
| | N | McGrath, Sarah | | Qualitative Analyst | 0.5 | 0.0 | 0.0 | | | NA |

**Glossary of acronyms:**
S/K - Senior/Key
Cal - Person Months (Calendar)
Aca - Person Months (Academic)
Sum - Person Months (Summer)
Foreign Org - Foreign Organization Affiliation
SS - Supplement Support
RS - Reentry Supplement
DS - Diversity Supplement
OT - Other
NA - Not Applicable

## D.2 PERSONNEL UPDATES

### D.2.a Level of Effort

Not Applicable

### D.2.b New Senior/Key Personnel

Not Applicable

### D.2.c Changes in Other Support

Not Applicable

### D.2.d New Other Significant Contributors

Not Applicable

### D.2.e Multi-PI (MPI) Leadership Plan

Not Applicable

# E. IMPACT

| |
|---|
| **E.1 WHAT IS THE IMPACT ON THE DEVELOPMENT OF HUMAN RESOURCES?**<br><br>Not Applicable |
| **E.2 WHAT IS THE IMPACT ON PHYSICAL, INSTITUTIONAL, OR INFORMATION RESOURCES THAT FORM INFRASTRUCTURE?**<br><br>NOTHING TO REPORT |
| **E.3 WHAT IS THE IMPACT ON TECHNOLOGY TRANSFER?**<br><br>Not Applicable |
| **E.4 WHAT DOLLAR AMOUNT OF THE AWARD'S BUDGET IS BEING SPENT IN FOREIGN COUNTRY(IES)?**<br><br>NOTHING TO REPORT |

# G. SPECIAL REPORTING REQUIREMENTS SPECIAL REPORTING REQUIREMENTS

**G.1 SPECIAL NOTICE OF AWARD TERMS AND NOTICE OF FUNDING OPPORTUNITIES REPORTING REQUIREMENTS**

File(s) uploaded:
Data Management Plan.pdf

SF428B_2.pdf

**G.2 RESPONSIBLE CONDUCT OF RESEARCH**

Not Applicable

**G.3 MENTOR'S REPORT OR SPONSOR COMMENTS**

Not Applicable

**G.4 HUMAN SUBJECTS**

**G.4.a Does the project involve human subjects?**

Not Applicable

**G.4.b Inclusion Enrollment Data**

File(s) uploaded:
HWMI N2810 CumulativeInclusionEnrollmentReport.pdf

**G.4.c ClinicalTrials.gov**

**Does this project include one or more applicable clinical trials that must be registered in ClinicalTrials.gov under FDAAA?**

**G.5 HUMAN SUBJECTS EDUCATION REQUIREMENT**

NOT APPLICABLE

**G.6 HUMAN EMBRYONIC STEM CELLS (HESCS)**

**Does this project involve human embryonic stem cells (only hESC lines listed as approved in the NIH Registry may be used in NIH funded research)?**

No

**G.7 VERTEBRATE ANIMALS**

Not Applicable

**G.8 PROJECT/PERFORMANCE SITES**

Not Applicable

| G.9 FOREIGN COMPONENT |
| --- |
| No foreign component |
| **G.10 ESTIMATED UNOBLIGATED BALANCE** |
| Not Applicable |
| **G.11 PROGRAM INCOME** |
| Not Applicable |
| **G.12 F&A COSTS** |
| Not Applicable |

**Data Management Plan –** Please describe the data that was shared under the award, the process and timing for such sharing, and any legal limitations that the Recipient asserts would hinder CDC access to, or use of, the data collected or generated under the award. In addition, the DMP should address broader access to and archiving/long-term preservation of collected or generated data. Additional information on the Data Management and Access requirements can be found at: https://www.cdc.gov/grants/additional-requirements/ar-25.html

No study data have been shared to date. We will assure that a cleaned, de-identified copy of the final data set used in conducting the final analyses of the study will be made available within one year after the completion of the study. Final study data may be shared in six ways: (1) Individually Identifiable Data may be shared pursuant to valid HIPAA Authorization, Informed Consent, and an appropriate written agreement limiting use of the data to the conditions described in the authorization and consent. (2) Individually Identifiable Data, excluding participant names and 38 USC §7332-protected information, may be shared, pursuant to a written request and IRB approved waiver of HIPAA authorization, with the approval of the Under Secretary for Health, in accordance with VHA Handbook 1605.1 §13.b(1)(b) or §13.b(1)(c) or superseding versions of that Handbook.(3) Individually Identifiable Data, including 38 USC 7332-protected information, may be shared, pursuant to the above requirements and a written assurance from the recipient that the information will be maintained in accordance with the security requirements of 38 CFR Part 1.466, or more stringent requirements, the information will not be re-disclosed except back to VA, and the information will not identify any individual patient in any report of the research or otherwise disclose patient identities. (4) A Limited Dataset may be created and shared pursuant to a Data Use Agreement appropriately limiting use of the dataset and prohibiting the recipient from identifying or re-identifying (or taking steps to identify or re-identify) any individual whose data are included in the dataset. (5) A De-identified, Anonymized Dataset may be created and shared. 6) All Non-Exempt, Reasonably Segregable Data must be shared pursuant to a valid Freedom of Information Act (FOIA) request, as determined by the FOIA Officer.

# TANGIBLE PERSONAL PROPERTY REPORT
## Final Report SF-428-B

OMB Number: 4040-0018
Expiration Date: 11/30/2024

Federal Grant or Other Identifying Number Assigned by Federal Agency *(Block 2 on SF-428).*

5R21OH012201-02

1. **Report** *(Select all that apply)*

☐ a. Federally-owned Property *(List on Supplemental Sheet SF-428S or recipient equivalent and complete Section 2a below)*

☐ b. Acquired Equipment with acquisition cost of $5,000 or more for which the awarding agency has reserved the right to transfer title *(List on Supplemental Sheet SF-428S or recipient equivalent and complete Section 2b below).*

☐ c. Residual Unused Supplies with total aggregate fair market value exceeding $5,000 not needed for any other Federally sponsored programs or projects *(Complete Section 2c below).*

☒ d. None of the above

2. Complete relevant section(s)

2a. **Federally-owned Property** *(Select one or more).*

☐ (i) Request transfer to Award

☐ (ii) Request Federal Agency disposition instructions

☐ (iii) Other *(Provide detail in Block **3** or attach request)*

2b. **Acquired Equipment with current fair market value of $5,000 or more:**
(Select one or more and attach Supplemental Sheet SF-428S or recipient equivalent)

☐ (i) Acknowledge equipment acquired under this federal award will be retained for use as originally approved.

☐ (ii) Request Federal Agency disposition instructions.

**For Agency Use Only**

Agency response to requested disposition of Federally owned property:

☐ (i) Recipient request approved ☐ denied

☐ (ii) Dispose in accordance with attached instructions:

Agency response to requested disposition of acquired equipment:

☐ (i) Recipient request approved ☐ denied

☐ (ii) Dispose in accordance with attached instructions:

Authorized Awarding Agency Official:

| Signature: | Date: |
|---|---|
| Name: | Phone: |
| Title: | E-Mail: |

Add Attachment | Delete Attachment | View Attachment

2c. **Reportable Residual Unused Supplies**

(i) ☐ Sale proceeds or ☐ Estimate of current fair market value . . . . . $

(ii) Percentage of Federal participation . . . . . %

(iii) Federal share . . . . . $

(iv) Selling and handling allowance. . . . . $

(v) **Amount remitted to the Federal Government** . . . . . $

3. Comments

Add Attachment | Delete Attachment | View Attachment

FINAL REPORT ATTACHMENT TO SF-428

**Agency Use Only**

# Instructions for Final Report: SF-428 Attachment B

## A. General Instructions:

This Attachment is to be used by recipients when required to provide a final property report for closeout of Federal assistance awards. The Attachment allows recipients to request specific disposition of Federally-owned property and acquired equipment. The attachment also provides a means for calculating and transmitting appropriate compensation to the awarding agency for residual unused supplies.

Requirements for final reporting are based on individual award provisions and the type of property. Generally, at the end of a Federal assistance award, recipients are required to:

a. submit a report of Federally-owned property.

b. provide a listing of equipment items, with an acquisition cost of $5,000 or more, when the awarding agency has reserved the right to transfer title to the equipment to the Federal Government or a third party.

c. compensate the awarding agency for residual unused supplies with a total aggregate fair market value greater than $5,000 that are not needed for any other Federally sponsored programs or projects.

**Federal Grant or Other Identifying Number Assigned by Federal Agency.** Enter the Federal grant, cooperative agreement or other Federal financial assistance award instrument number or other identifying number assigned to the Federal financial assistance award.

1. **Report.** Check applicable lines a-c to indicate the type of property that is being reported. Note: Federally-owned property includes items provided by the awarding agency, regardless of dollar value. Check line d to indicate no property to report, if the awarding agency requires a negative report.

2. Complete the relevant sections to correspond with the property reported in Block 1.

2a. **Federally-owned Property.**

(i) To request transfer of the property for use on a specific Federal award.

(ii) To request Federal agency disposition instructions for unneeded Federally-owned property.

(iii) To request a disposition other than (i) or (ii). For example, requests for transfer of title under authority of the Stevenson-Wydler Act.

2b. **Acquired Equipment with acquisition cost of $5,000 or more for which the awarding agency has reserved the right to transfer title.**

(i) Recipients should indicate any equipment acquired with federal funds will continued to be used in accordance with grant approved activities.

(ii) To request Federal agency disposition instructions when acquired equipment is not needed for originally approved purposes.

Supplemental Sheet SF-428S or recipient equivalent - Attach Supplemental Sheet SF-428S or recipient equivalent.

2c. **Reportable Residual Unused Supplies.** Indicate whether the supplies have been sold or if they will be retained for use solely on non Federally-funded projects.

(i) Enter the total amount of sales proceeds or an estimate of the current fair market value if the supplies will be retained. Note: Fair market value means the best estimate of the gross sales proceeds if the property were to be sold in a public sale.

(ii) Enter the percentage of Federal Government participation in the award under which the supplies were acquired.

(iii) Enter the dollar amount of sales proceeds (or estimate of current fair market value) multiplied by the percentage of Federal Government participation listed in (ii).

(iv) If the supplies were sold, enter the amount of selling and handling expenses. Enter zero if the supplies will be retained for use on non Federally funded projects.

(v) Enter the amount of the Federal share in (iii) less the selling and handling expense listed in (iv). Indicate in Block 3 how the funds are being returned to the government (e.g., attached check made out to the Awarding Agency/U.S. Treasury or electronic remission).

3. **Comments.** Provide any explanations or additional information in this block. Attach additional sheets if necessary.

**Agency use only.** This section is reserved for Federal agency use only.

# Cumulative Inclusion Enrollment Report

**This report format should NOT be used for collecting data from study participants.**

**Study Title:** HWMI

**Comments:** Race and ethnic distributions for a 2,810 survey participants regardless of survey completeness.

| Racial Categories | Ethnic Categories | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | Not Hispanic or Latino | | | Hispanic or Latino | | | Unknown/Not Reported Ethnicity | | | |
| | Female | Male | Unknown/ Not Reported | Female | Male | Unknown/ Not Reported | Female | Male | Unknown/ Not Reported | |
| American Indian/ Alaska Native | 8 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | **14** |
| Asian | 219 | 86 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | **310** |
| Native Hawaiian or Other Pacific Islander | 8 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **13** |
| Black or African American | 289 | 45 | 9 | 5 | 0 | 0 | 0 | 0 | 0 | **348** |
| White | 911 | 323 | 17 | 17 | 10 | 2 | 0 | 0 | 0 | **1280** |
| More Than One Race | 39 | 20 | 3 | 3 | 1 | 0 | 0 | | 0 | **66** |
| Unknown or Not Reported | 36 | 10 | 590 | 102 | 40 | 1 | 0 | 0 | 0 | **779** |
| **Total** | **1510** | **492** | **624** | **129** | **52** | **3** | **0** | **0** | **0** | **2810** |

**PHS 398 / PHS 2590 (Rev. 08/12 Approved Through 8/31/2015)**

**Page ___**

**OMB No. 0925-0001/0002**
**Cumulative Inclusion Enrollment Report**

# I. OUTCOMES

**I.1 What were the outcomes of the award?**

Project: Moral Injury Among Healthcare Workers on the Frontlines of the COVID-19 Crisis: Developing a Blueprint for Awareness, Prevention, & Mitigation
Contact PI: Natalie Purcell, PhD, MPA
Organization: San Francisco VA Health Care System; University of California, San Francisco (UCSF); Northern California Institute for Research and Education

Moral injury is lasting psychological and spiritual distress that stems from violating one's values or feeling betrayed by a trusted institution or authority. Moral injury is associated with post-traumatic stress (PTSD), depression, anxiety, substance use, functional impairments, and suicide risk. Healthcare workers whose jobs put them in high-stakes life-or-death situations, and who may experience intense and prolonged work stress, may be especially vulnerable to moral injury.

Using a combination of quantitative and qualitative methods, we examined drivers of risk for moral injury, mental health symptoms, and burnout among frontline healthcare workers in high-risk Veterans Affairs (VA) clinical settings during the COVID-19 pandemic. Across 21 VA medical centers, 2,004 healthcare workers completed an online survey assessing potential risk factors for moral injury, posttraumatic stress, depression, and burnout. These potential risk factors included: pandemic exposures and events; individual worker characteristics; aspects of workplace/organizational culture; and facility-level performance on standardized measures of care quality, patient satisfaction, and employee satisfaction. Forty-six surveyed workers also completed a follow-up qualitative interview about experiences of moral distress in the workplace.

We found that 39% of surveyed workers were at risk for moral injury, 41% for posttraumatic stress, 27% for depression, and 25% for persistent burnout. Significant predictors of moral injury risk included perceived management support for worker health/safety, supervisor support, coworker support, and empowerment to make job-related decisions—all modifiable workplace factors. Pandemic-related risk factors for moral injury included prolonged short-staffing, denying patient-family visits, and high work-family conflict. Predictors of posttraumatic stress, depression, and burnout were similar.

Interview themes aligned closely with survey findings. Qualitative analysis identified protective factors that may reduce moral injury risk, including a collaborative workplace community, engaged leadership, empowerment to make changes in the workplace, and opportunity to process distressing events.

Recommendations to mitigate moral injury risk in healthcare organizations stemming from this project include: involving workers in discussions of high-stakes decisions that will affect them, creating consistent and clear channels of communication between the frontlines and leaders of the organization, practicing leadership rounding to improve leaders' understanding of the daily work of frontline teams, and collaborating to understand how existing processes and policies may contribute to safety risks and moral conflict. Study findings were used to create a document for healthcare leaders called, "Moral Injury Awareness and Prevention in Healthcare Organizations: A Blueprint Informed by the COVID-19 Pandemic," available at: https://healthforce.ucsf.edu/publications/moral-injury-awareness-and-prevention-healthcare-organizations-blueprint-informed-covid