Moral Injury and Burnout in Health Care Professionals During the COVID-19 Pandemic

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Abstract: The coronavirus pandemic (COVID-19) is predicted to increase burnout in health professionals (HPs), but little is known about moral injury (MI) in this context. We administered the Moral Injury Symptoms Scale for Health Professionals (MISS-HP) and the abbreviated Maslach Burnout Inventory via online survey to a global sample of 1831 HPs in April and October 2020. Mean MISS-HP increased from 27.4 (SD, 11.6) in April to 36.4 (SD, 13.8) in October ($p < 0.001$), with an accompanying increase in personal accomplishment (April: 4.7; SD, 3.1; October: 9.3; SD, 3.1; $p < 0.001$) and no change in other burnout subscales. In April, 26.7% of respondents reported at least moderate functional impairment from MI, increasing to 45.7% in October ($p < 0.001$). Predictors of MISS-HP included younger age and being a nurse. Odds of functional impairment were higher in respondents who were widowed, divorced, never married, or had direct experience caring for patients with COVID-19. COVID-19 has increased MI but not burnout in HPs; younger or unmarried individuals, nurses, and frontline workers may benefit from targeted outreach to reduce downstream effects of MI, depression, and/or posttraumatic stress disorder.

Key Words: Moral injury, burnout, coronavirus

(*J Nerv Ment Dis* 2021;209: 720–726)

Moral injury (MI) refers to symptoms resulting from participation in acts that violate core moral beliefs (Brock and Lettini, 2012) or result from feeling betrayed by authorities with shared moral values (Shay, 2014). Initially conceived in a military context (Ames et al., 2019; Fontana and Rosenheck, 2004), MI is an emerging theoretical construct in health professionals (HPs) that might help explain the epidemic of clinician burnout (Kopacz et al., 2019) and the failure of wellness initiatives to stem the rising tide of burnout (Shanafelt et al., 2015; Sibeoni et al., 2019). In other words, distinguishing MI from burnout may help individuals and organizations more clearly target interventions to the needs of participants. Because burnout is in part a function of time, it is unlikely to result de novo from an acute event. In contrast, an MI lens offers a view of acute HP distress that arises from "the challenge of simultaneously knowing what care patients need but being unable to provide it due to constraints that are beyond our control" (Dean et al., 2019). Thus, MI represents a fundamental failure of the "covenant" between HPs and patients (Ofri, 2019), leading to ongoing feelings of shame and guilt among sufferers (Ferguson, 2017; Lyons et al., 2018). MI is significantly associated with functional impairment and medical errors (Mantri et al., 2020a) and is associated with desire to leave the practice of medicine (Sajjadi et al., 2017; Whitehead et al., 2015). Thus, its presence in HPs has critical implications for both workforce shortages and patient safety.

The presence of MI among clinical staff was documented before the onset of the pandemic caused by the novel coronavirus disease 2019 (COVID-19), with nearly one in four clinicians reporting at least moderate impairment (Mantri et al., 2020a) in family, social, or occupational functioning. Into this already-strained environment, the COVID-19 pandemic has further disrupted traditional models of care and support for clinicians and patients (Dean et al., 2020). Both mental health disorders and MI are predicted to increase among clinicians in the wake of the pandemic (Carmassi et al., 2020; Heitzman, 2020; Mohsin et al., 2020; Restauri and Sheridan, 2020). The shifting nature of the pandemic also increases uncertainty and ambiguity (Durodié, 2020), which could further compound the trauma faced by individual clinicians and health systems around the globe. In this study, we sought to a) characterize the changes in HP MI wrought by the pandemic over the course of 2020 and b) identify potential predictors of MI among HPs.

METHODS

Study Design

This was a cross-sectional study administered via online survey (Qualtrics) in two phases. Phase 1 took place from April 24 to May 31, 2020. In phase 2, a second sample was acquired 6 months later, from October 24 to November 30, 2020. For each of these phases, participants were recruited via snowball sampling through e-mail distributions and social media platforms (*e.g.*, Doximity, LinkedIn, Twitter, and Facebook groups geared toward HPs). The recruitment e-mail and social media posts contained an anonymous link to the survey. Informed consent was obtained on the first page of the survey. Those who marked the box "I consent, begin the study" were taken to the survey itself. Inclusion criteria were being an HP or HP student. Respondents who did not complete the Moral Injury Symptoms Scale for Health Professionals (MISS-HP) were excluded from the analysis. The survey was administered in English.

Assessments

Demographics consisted of age band (in 10-year increments), sex, race/ethnicity, marital status, religious affiliation, profession, and geographic location (census division for US respondents, country for all others). Respondents were then asked what level of experience they had taking care of people with COVID-19. The quantitative portion of the survey consisted of three Likert-scale questionnaires:

1. The MISS-HP (Mantri et al., 2020b). The MISS-HP is a 10-item scale assessing symptoms of MI among HPs. The MISS-HP is derived from the previously validated Moral Injury Symptoms Scale–Military Version (Koenig et al., 2018) and, like its predecessor, produces a summed score ranging from 10 to 100, with higher scores indicating greater MI. The MISS-HP has strong psychometric properties (Mantri et al., 2020b) and has been validated in two independent groups of HPs (Mantri et al., 2020a; Wang et al., 2020).

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Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's Web site (www.jonmd.com).

ISSN: 0022-3018/21/20910–0720
DOI: 10.1097/NMD.0000000000001367

2. The intrinsic religiosity subscale of the Duke University Religion Index (DUREL) (Koenig et al., 1997). The DUREL is a five-item measure of religiosity. The three-item intrinsic religiosity subscale has been validated across several cultures (Lace and Handal, 2018; Saffari et al., 2013; Wang et al., 2014), making it an appropriate choice for a global sample. Respondents select the extent to which a statement is true or not true for them on a 5-point Likert scale ("definitely true" to "definitely not true"); responses are reverse-summed to obtain an intrinsic religiosity score ranging from 3 to 15, where with higher scores indicate greater religiosity.
3. The abbreviated Maslach Burnout Inventory (aMBI) (Gabbe et al., 2002). The aMBI is a nine-item scale assessing domains of emotional exhaustion, depersonalization, and reduced personal/professional accomplishment. In the aMBI, each domain consists of three items that lie on a 7-point Likert scale from "never" (0) to "every day" (6), producing summed subscale scores ranging from 0 to 18. For emotional exhaustion and depersonalization, higher scores represent greater burnout; the reverse is true for the personal/professional accomplishment subscale. Because it is shorter than the traditional 22-item Maslach Burnout Inventory, the aMBI is easier to administer and has been used in several other studies of clinician burnout (Colville et al., 2017; Lebares et al., 2018; Marquez-Cunningham et al., 2019; Purvis et al., 2019; Shaikh et al., 2019).

Statistical Analyses

Statistical analyses involving continuous variables (MISS-HP, DUREL, and aMBI) were conducted using Stata 14.2 (Statacorp LLC, College Station, TX). For each phase, total scores for the MISS-HP and DUREL and subscale scores for the aMBI were calculated and summarized with descriptive statistics, and comparisons between the two periods (phases) were calculated using unpaired two-tailed Student's *t*-test to 95% confidence. Because this study was designed as a repeated cross-sectional survey and we cannot definitively determine how many respondents overlapped between the two groups, we opted to perform unpaired comparisons between phases. For each phase independently, pairwise correlations between demographics, MISS-HP, DUREL, and subscale scores for the aMBI were calculated. A multivariate multiple regression model was built using demographic and professional variables; where variables were collinear (*e.g.*, DUREL and religious affiliation), only the variable with the higher pairwise correlation was included in the model. Lastly, an ordered logistic regression model was constructed with those variables to examine the odds of functional impairment from MI symptoms.

RESULTS

Demographic characteristics of respondents in phase 1 and 2 are shown in Table 1 and Supplemental Table S1 (Supplemental Digital Content 1, http://links.lww.com/JNMD/A116). In phase 1 (April/May 2020), 618 individuals opened the survey; 66 did not provide any responses, and a further 102 were excluded for noncompletion of the MISS-HP, leaving a phase 1 sample of 450 individuals (72.8% completion rate). Noncompleters were more likely to be Asian (11.3% of noncompleters *vs.* 5.3% of completers; $p = 0.02$), although there were no other significant demographic differences between completers and noncompleters. Although completers were more likely to report actively caring for patients with COVID-19 at the time of the survey (36.4% *vs.* 21.6% for noncompleters; $p = 0.004$), there were no other differences in personal or professional experiences caring for patients with COVID-19 in phase 1.

In phase 2 (October/November 2020), 1874 individuals opened the survey; 152 did not provide any responses, and a further 341 were excluded for noncompletion of the MISS-HP, leaving a final sample of 1381 in phase 2 (73.7% completion rate). Noncompleters in this phase were less likely to be White (88.3% *vs.* 93.3% of completers; $p = 0.002$), again more likely to be Asian (6.5% *vs.* 3.6% of completers; $p = 0.02$), "other" race (6.5% *vs.* 3.5% of completers; $p = 0.02$), and located in Africa (0.9% *vs.* 0.1% of completers; $p = 0.006$). Professionally, phase 2 completers were more likely to be nurses (56.5% *vs.* 44.3% of noncompleters; $p < 0.001$) and have active experience caring for patients with COVID-19 (45.9% *vs.* 29.6% of noncompleters; $p < 0.001$), whereas noncompleters were more likely to report no personal or professional experience with COVID-19 (13.5% *vs.* 7.6% for completers; $p < 0.001$) and no direct involvement in patient care (18.5% *vs.* 5.8% of completers; $p < 0.001$). Comparisons of individual response metadata (IP address, longitude/latitude) and demographic data between phases revealed that a maximum of 13 individuals from phase 1 may have also completed the survey in phase 2; however, because some of these individuals may have used a shared/public computer and because the overall degree of overlap was small, we opted to proceed with statistical analysis as planned.

The mean MISS-HP was 27.4 (SD, 11.6) in phase 1 and 36.4 (SD, 13.8) in phase 2 ($p < 0.001$). In phase 1, 26.7% of respondents reported at least moderate impairment in social or professional functioning related to their MI symptoms; in phase 2, 45.7% of respondents reported this finding ($p < 0.001$; Fig. 1). Mean DUREL was not significantly different between phase 1 and phase 2 (9.3 ± 3.0 *vs.* 9.5 ± 4.0; $p = 0.33$). Among the burnout subscales, there was no difference in emotional exhaustion scores between phases (7.6 ± 4.7 *vs.* 7.6 ± 4.2), but personal accomplishment increased from phase 1 to phase 2 (4.7 ± 3.1 *vs.* 9.3 ± 3.1; $p < 0.001$), and there was a concomitant trend toward increased depersonalization (13.7 ± 3.9 *vs.* 14.1 ± 4.4; $p = 0.07$).

Pairwise correlations between demographics, MISS-HP, DUREL, and burnout subscales are shown in Table 2. In both phases, MISS-HP was inversely correlated with DUREL as well as the emotional exhaustion and depersonalization subscales of the aMBI, but positively correlated with the personal accomplishment subscale. Results from the multivariate multiple regression model, which examined cross-sectional correlations in the combined sample of participants (Table 3) and in each phase separately (Supplemental Tables S2 and S3, Supplemental Digital Content 1, http://links.lww.com/JNMD/A116), indicated that significant negative predictors of MISS-HP in the combined sample included age more than 55 years ($B = -4.37$, SE = 1.19, $p < 0.001$), greater religiosity ($B = -0.68$, SE = 0.09, $p < 0.001$), and nonnursing profession (physician: $B = -5.26$, SE = 1.01; advanced practice provider: $B = -5.33$, SE = 1.05; other: $B = -4.17$, SE = 0.86; all $p < 0.001$). Direct experience with patients with COVID-19 was associated with an increase in MISS-HP ($B = 2.73$, SE = 0.89; $p = 0.002$). Divorced individuals also had higher MISS-HP than currently married individuals ($B = 3.06$, SE = 1.08; $p = 0.005$), and there was a trend toward increased MISS-HP for never married individuals ($B = 1.62$, SE = 0.91, $p = 0.08$). Similarly (Table 4 and Supplemental Table S4, Supplemental Digital Content 1, http://links.lww.com/JNMD/A116), older age was associated with lower odds of functional impairment from MI symptoms (odds ratio [OR], 0.54; $p < 0.001$). Compared with nurses, all other professions had lower functional impairment from MI symptoms (Table 4). Those who were widowed (OR, 2.57; $p = 0.025$), divorced (OR, 1.53; $p = 0.005$), or never married (OR, 1.47; $p = 0.002$) all had higher odds of functional impairment from MI symptoms, as did those with direct experience caring for patients with COVID-19 (OR, 1.65; $p < 0.001$).

In the burnout analysis, age 55 years or more was associated with higher emotional exhaustion ($B = 1.51$, SE = 0.38, $p < 0.001$), higher depersonalization ($B = 3.41$, SE = 0.37, $p < 0.001$), and lower sense of professional accomplishment ($B = -0.68$, SE = 0.32, $p = 0.033$). Age 35 to 54 was associated with increased depersonalization ($B = 1.74$, SE = 0.25, $p < 0.001$), with trends toward higher emotional exhaustion ($B = 0.49$, SE = 0.26, $p = 0.06$) and higher personal accomplishment ($B = 0.37$, SE = 0.21, $p = 0.09$). Profession was not significantly associated with levels of depersonalization, but compared with nurses, physicians had greater emotional exhaustion ($B = 0.71$, SE = 0.32, $p = 0.03$) and lower personal accomplishment ($B = -2.61$, SE =

TABLE 1. Demographic Characteristics of Respondents

	Phase 1 Completers	Phase 1 Noncompleters	Phase 2 Completers	Phase 2 Noncompleters
	n = 450	*n* = 102	*n* = 1381	*n* = 341
Age				
18–24	15 (3.3%)	6 (5.9%)	24 (1.7%)	11 (3.2%)
25–34	129 (28.7%)	26 (25.5%)	329 (23.8%)	83 (24.3%)
35–44	149 (33.1%)	39 (38.2%)	527 (38.2%)	125 (36.7%)
45–54	84 (18.7%)	11 (10.8%)	321 (23.2%)	87 (25.5%)
55–64	50 (11.1%)	15 (14.7%)	156 (11.3%)	32 (9.4%)
65–74	23 (5.1%)	5 (4.9%)	21 (1.5%)	3 (0.9%)
75+	0 (0%)	0 (0%)	3 (0.2%)	0 (0.0%)
Sex				
Male	56 (12.4%)	10 (9.8%)	131 (9.5%)	41 (12.0%)
Female	390 (86.7%)	92 (90.2%)	1246 (90.2%)	299 (87.7%)
Nonbinary	4 (0.9%)	0 (0%)	4 (0.3%)	1 (0.3%)
Race				
White	399 (88.7%)	86 (81.1%)	**1288 (93.3%)**	**301 (88.3%)**
Black	14 (3.1%)	4 (3.8%)	11 (0.8%)	4 (1.2%)
AI/AK	5 (1.1%)	0 (0%)	17 (1.2%)	4 (1.2%)
Asian	**24 (5.3%)**	**12 (11.3%)**	**50 (3.6%)**	**22 (6.5%)**
Hawaii/PI	0 (0%)	0 (0%)	7 (0.5%)	0 (0.0%)
Other	19 (4.2%)	4 (3.7%)	**49 (3.5%)**	**22 (6.5%)**
Marital status				
Married	303 (67.3%)	62 (60.8%)	910 (65.9%)	236 (69.2%)
Widowed	2 (0.4%)	1 (1.0%)	21 (1.5%)	6 (1.8%)
Divorced	44 (9.8%)	6 (5.9%)	174 (12.6%)	41 (12.0%)
Separated	4 (0.9%)	2 (2.0%)	18 (1.3%)	3 (0.9%)
Never married	97 (21.6%)	31 (30.4%)	258 (18.7%)	55 (16.1%)
Religious affiliation				
Christian	311 (69.1%)	63 (61.8%)	932 (67.5%)	241 (70.7%)
Jewish	22 (4.9%)	7 (6.9%)	26 (1.9%)	3 (0.9%)
Hindu	7 (1.6%)	4 (3.4%)	6 (0.4%)	4 (1.2%)
Muslim	5 (1.1%)	3 (2.9%)	5 (0.4%)	2 (0.6%)
Buddhist	6 (1.3%)	0 (0%)	8 (0.6%)	1 (0.3%)
Atheist/agnostic	65 (14.4%)	16 (15.7%)	275 (19.9%)	70 (20.5%)
Other	34 (7.6%)	9 (8.8%)	129 (9.3%)	20 (5.9%)
Profession				
Nurse	143 (31.8%)	28 (27.5%)	**780 (56.5%)**	**151 (44.3%)**
Physician	116 (25.8%)	25 (24.5%)	166 (12.0%)	32 (9.4%)
APP	85 (18.9%)	20 (19.6%)	136 (9.8%)	38 (11.1%)
Housekeeping	0 (0%)	0 (0%)	1 (0.1%)	1 (0.3%)
Food services	0 (0%)	0 (0%)	1 (0.1%)	0 (0.0%)
Interpreter	0 (0%)	0 (0%)	2 (0.1%)	0 (0.0%)
Patient transport	0 (0%)	1 (1.0%)	0 (0.0%)	1 (0.3%)
Chaplaincy	64 (14.2%)	11 (10.8%)	2 (0.1%)	1 (0.3%)
Social worker	13 (2.9%)	3 (2.9%)	18 (1.3%)	7 (2.1%)
Other	29 (6.4%)	14 (13.7%)	**275 (19.9%)**	**110 (32.3%)**

Percentages for race may add to more than 100% as respondents could select multiple options. Bold text indicates $p < 0.05$ by chi-square test.
AI/AK indicates American Indian/Alaska Native; PI, Pacific Islander.

0.27, $p < 0.001$); being an advanced practice provider (APP) or other HP was not associated with higher emotional exhaustion but was associated with lower personal accomplishment ($B_{APP} = -1.91$, $SE_{APP} = 0.28$; $B_{other} = -1.01$, SE = 0.23; both $p < 0.001$). Being divorced was associated with lower emotional exhaustion compared with married respondents ($B = -0.73$, SE = 0.349, $p = 0.036$); marital status was not otherwise associated with burnout subscales. Direct experience with COVID-19 was associated with lower emotional exhaustion ($B = -0.87$, SE = 0.29, $p = 0.003$), with trends toward decreased depersonalization ($B = -0.47$, SE = 0.28, $p = 0.095$) and increased personal accomplishment ($B = 0.47$, SE = 0.24, $p = 0.051$). Lastly, religiosity was associated with greater depersonalization ($B = 0.13$, SE = 0.02,

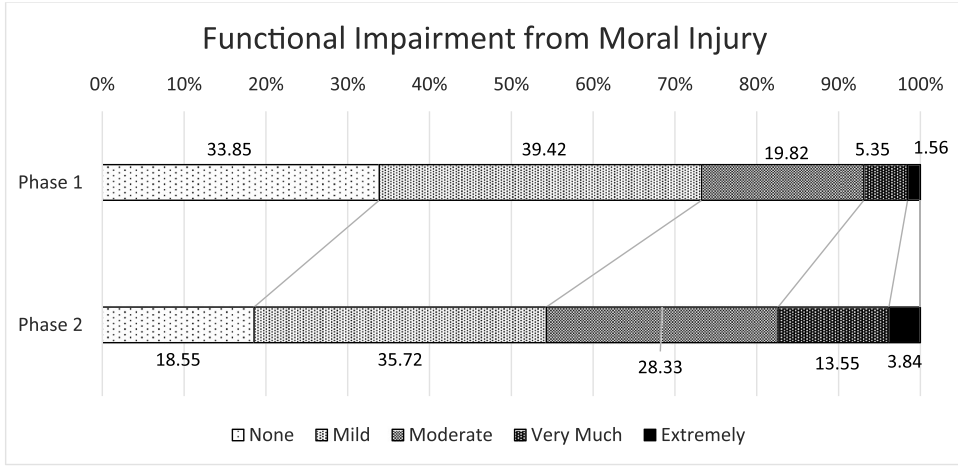

FIGURE 1. Functional impairment from MI.

$p < 0.001$) and reduced personal accomplishment ($B = -0.09$, SE = -0.02, $p < 0.001$), but not with emotional exhaustion.

DISCUSSION

Between the spring and fall of 2020, levels of MI among separate samples of HPs increased dramatically, and reports of functional impairment from MI symptoms nearly doubled. Younger or divorced individuals, nurses, and those with direct experience caring for patients with COVID-19 in this study were at highest risk for MI symptoms and functional impairment from MI. By contrast, religiosity was associated with lower levels of MI. Other studies have demonstrated that a sense of vocation improves clinician well-being (Tak et al., 2017; Yoon et al., 2017), which may in turn reduce MI symptoms. In addition, religious belief serves as a coping mechanism among HPs (Ekedahl and Wengström, 2010) and the general population to make meaning in difficult situations. Thus, the inverse association between religiosity and MI may indicate a protective effect of religious/spiritual belief and is consistent with known treatment mechanisms of MI, which often emphasize a reconnection with religious/spiritual foundations (Brémault-Phillips et al., 2019; Carey and Hodgson, 2018). However, the MISS-HP directly asks the respondent about religious struggles and loss of faith; individuals with lower religiosity, or who identify as spiritual but not religious (Wixwat and Saucier, 2020), would thus be expected to have lower scores on this scale. A substantial proportion of our respondents identified as agnostic or atheist, which is consistent with rates of nontheistic orientation among clinicians (Robinson et al., 2017) but which may have impacted individual interpretation of the MISS-HP. In our sample, those who self-identified as agnostic or atheist did have higher scores on the MISS-HP compared with those who identified with a religious tradition; further assessment is needed to determine if there are specific factors influencing the development of MI in nonreligious individuals.

TABLE 2. Correlations Between MI and Demographics, Religiosity, and Burnout

	Phase 1		Phase 2		Combined	
	r	*p*	*r*	*p*	*r*	*p*
Age	**−0.18**	**<0.001**	**−0.12**	**<0.001**	**−0.13**	**<0.001**
Sex	0.02	0.705	0.04	0.201	0.04	0.113
Race	0.04	0.392	−0.04	0.187	0.03	0.226
Marital status	0.04	0.409	**0.13**	**<0.001**	**0.10**	**<0.001**
Profession	**−0.12**	**0.010**	**−0.13**	**<0.001**	**−0.16**	**<0.001**
COVID experience	−0.01	0.914	**0.10**	**0.004**	**0.10**	**<0.001**
DUREL	**−0.17**	**0.003**	**−0.20**	**<0.001**	**−0.19**	**<0.001**
Burnout_EE	**−0.36**	**<0.001**	**−0.48**	**<0.001**	**−0.43**	**<0.001**
Burnout_DP	**−0.36**	**<0.001**	**−0.40**	**<0.001**	**−0.36**	**<0.001**
Burnout_PA	**0.32**	**<0.001**	**0.36**	**<0.001**	**0.43**	**<0.001**

Pairwise comparisons using listwise deletion for missing values, and Bonferroni adjustment for multiple comparisons. Bold text indicates significant results.

DP indicates depersonalization; EE, emotional exhaustion; PA, personal accomplishment.

In contrast to the rise in MI, indicators of burnout, including emotional exhaustion and depersonalization, remained steady over this time, and levels of personal accomplishment increased as the pandemic wore on. This suggests that MI is a parallel construct to burnout. One may feel great personal pride in one's work (particularly for highly visible work such as frontline nursing) and yet still be injured by it (Correia and Almeida, 2020). MI has been suggested as a precursor to burnout (Mantri et al., 2020a), and it is possible that burnout rates will continue to increase as a lagging marker of ongoing moral strain. Other coronavirus pandemics, including the severe acute respiratory syndrome and the Middle Eastern respiratory syndrome, led to measurable changes in HP burnout and posttraumatic stress syndromes in the months and years after the surge (Carmassi et al., 2020). Studies of burnout and MI in the context of the current pandemic are still emerging but are largely consistent with our findings (Kang et al., 2020; Lai et al., 2020; Wang et al., 2020), including strong associations with age, profession, and frontline status.

To our knowledge, this is one of the largest studies assessing MI in HPs during the pandemic. Noted strengths include responses from over 1800 HPs and use of a well-validated scale of MI, which enabled us to capture aspects of HP experience that are not necessarily incorporated in traditional burnout scales. Nevertheless, some important limitations should be noted. First, recruitment was anonymous; we had no way to verify the HP status of our respondents. However, the rates of burnout and MI in our respondents were similar to those from other studies where HP status was documented (Mantri et al., 2020a; Shaikh et al., 2019; Wang et al., 2020), suggesting few responses to our survey came from non-HP respondents. Secondly, although we used social media in an attempt to recruit a geographically and professionally diverse group, more than 95% of our sample were located in North America, and few were nonclinicians (*e.g.*, housekeeping, food services, patient transport, interpreter). Our results may therefore not be generalizable outside the context of clinically oriented HPs in North

TABLE 3. Multivariate Multiple Regression Model Between MI and Burnout Against Demographics, Professional Experience, and Religiosity

	MI			EE			DP			PA		
	B	**SE**	***p***	***B***	**SE**	***p***	***B***	**SE**	***p***	***B***	**SE**	***p***
Age (ref: 18–34)												
35–54	−1.04	0.82	0.205	0.49	0.26	0.06	**1.74**	**0.25**	**<0.001**	0.37	0.21	0.090
55+	**−4.37**	**1.19**	**<0.001**	**1.51**	**0.38**	**<0.001**	**3.41**	**0.37**	**<0.001**	**−0.68**	**0.32**	**0.033**
Profession (ref: nurse)												
Physician	**−5.26**	**1.01**	**<0.001**	0.71	0.32	0.030	−0.26	0.31	0.406	**−2.61**	**0.27**	**<0.001**
APP	**−5.33**	**1.05**	**<0.001**	0.23	0.34	0.685	−0.34	0.33	0.301	**−1.91**	**0.28**	**<0.001**
Other	**−4.17**	**0.86**	**<0.001**	0.35	0.28	0.210	0.08	0.26	0.768	**−1.01**	**0.23**	**<0.001**
Marital status (ref: married)												
Widowed	1.12	3.04	0.711	−0.40	0.98	0.679	0.16	0.94	0.865	0.80	0.81	0.320
Divorced	**3.06**	**1.08**	**0.005**	**−0.73**	**0.34**	**0.036**	−0.49	0.34	0.141	0.25	0.29	0.375
Separated	1.21	3.36	0.719	0.12	1.08	0.91	0.41	0.40	0.692	−0.28	0.89	0.756
Never married	1.62	0.91	0.08	−0.03	0.29	0.92	−0.04	0.28	0.883	0.18	0.24	0.454
COVID experience	**2.73**	**0.89**	**0.002**	**−0.87**	**0.29**	**0.003**	−0.47	0.28	0.095	0.47	0.24	0.051
DUREL	**−0.68**	**0.09**	**<0.001**	0.01	0.03	0.665	**0.13**	**0.02**	**<0.001**	**−0.09**	**−0.02**	**<0.001**
Intercept	**41.06**	**1.42**	**<0.001**	**7.59**	**0.45**	**<0.001**	**11.80**	**0.44**	**<0.001**	**9.32**	**0.38**	**<0.001**

Bold values indicate statistically significant.

DP indicates depersonalization; EE, emotional exhaustion; PA, personal accomplishment.

America. In particular, nonclinical staff are often deeply impacted by their interactions with patients (Ashton and Manthorpe, 2019; Jors et al., 2017), but their viewpoints are rarely captured in studies of "teamwork" in health care settings; other studies suggest that individuals belonging to marginalized or vulnerable groups may be at higher risk of burnout and MI than those in the dominant group (Cerdeña et al., 2021; Chisholm et al., 2021). Targeted outreach by trusted individuals may be necessary to assess the impact of the pandemic on these vulnerable staff. In addition, the use of an English-only only survey platform and subsequent lack of geographic diversity meant that we were unable to assess the impact of different regional responses to the pandemic across the globe, particularly in areas with internet inequity. A parallel study of HPs in China (Wang et al., 2020) found similar rates of MI as in this study of primarily North Americans, suggesting that rates of MI are consistent across cultures and across health systems.

TABLE 4. Logistic Regression for Functional Impact of MI

	Odds Ratio	95% Confidence Interval		*p*
Age (ref: 18–34)				
35–54	0.92	0.82	1.14	0.424
55+	**0.54**	**0.39**	**0.75**	**<0.001**
Profession (ref: nurse)				
Physician	**0.61**	**0.46**	**0.79**	**<0.001**
APP	**0.70**	**0.52**	**0.92**	**0.011**
Other	**0.68**	**0.53**	**0.85**	**0.001**
Marital status (ref: married)				
Widowed	**2.57**	**1.12**	**5.90**	**0.025**
Divorced	**1.53**	**1.14**	**2.06**	**0.005**
Separated	1.30	0.49	3.39	0.589
Never married	**1.47**	**1.15**	**1.87**	**0.002**
COVID experience	**1.65**	**1.30**	**2.11**	**<0.001**
DUREL	1.00	0.98	1.02	0.95

Bold text indicates $p < 0.05$.

However, those in low- and middle-income countries may be subject to added strain due to limited health care infrastructure (Deng and Naslund, 2020; Rodríguez et al., 2021); further research is needed to quantify MI in these populations. In an effort to minimize survey burden, we did not include a dedicated measure of potentially morally injurious events (Hines et al., 2021, 2020; Litam and Balkin, 2020; Nash et al., 2013) in our survey, but rather focused on MI symptoms and the functional impairment they caused. Although the COVID-19 pandemic represents an overarching morally injurious global event, we did not assess for regional, local, or individual morally injurious events that could have explained some of the variance in MISS-HP. The phased design of this survey was originally intended to capture responses in the midst of the pandemic surge (spring 2020) and what we anticipated would be a return to postpandemic normalcy (fall 2020); we eagerly anticipate the point at which we might be able to obtain true "postcoronavirus" data.

Finally, this was not a longitudinal study but rather two cross-sectional studies conducted at separate times, not allowing us to definitively determine change over time or predictors of change among respondents themselves. Specifically, the study design, using snowball sampling of HPs through social media/e-mail, means that some proportion of respondents may have overlapped between phase 1 and phase 2; although the anonymous nature of our survey platform means we are unable to definitively determine the degree of overlap, comparison of unique response metadata between phases suggests that the degree of overlap comprised less than 1%. One longitudinal study, drawing on the same group of participants between March and June 2020, found that levels of MI were stable during the first 3 months of the pandemic (Hines et al., 2021); however, that study used a different MI scale from ours, used a convenience sample of only physicians from a single health care system, and temporally did not capture the impact of the summer and fall surges. These important differences in study design could explain the discrepancies between our results.

CONCLUSIONS

This study adds to the growing body of literature on the impact of the COVID-19 pandemic on HPs and helps make visible the "invisible epidemic" of MI (Dean et al., 2020). Several proposals exist to

address the expected rise in burnout among HPs after the pandemic (Dzau et al., 2020; Ferry, 2020; Restauri and Sheridan, 2020). The present work suggests that the pandemic has caused MI, but not burnout, in HPs. This may, in turn, lead staff to dismiss burnout mitigation proposals as merely "bagels and yoga" (Windish and Reddy, 2019). The evidence supporting these interventions for burnout is weak at best (Kunzler et al., 2020; Pollock et al., 2020), and they have been shown to be either ineffective or harmful as treatments for MI (Card, 2018). Just as both systemic and individual interventions are needed to flatten the curve of the coronavirus pandemic, a multimodal strategy, incorporating individual (Harris et al., 2011), peer (Shapiro and Galowitz, 2016), and organizational components (Maslach, 2017; Shanafelt and Noseworthy, 2017), can change the rising rates of MI among HPs. The pandemic has catalyzed enormous changes in clinical care. We urge health system leaders to attend to the needs of clinical staff as we move together into a postpandemic future.

ACKNOWLEDGMENT

We would like to thank Edwin Iversen for his statistical guidance on this project.

DISCLOSURE

This study was conducted in accordance with the Declaration of Helsinki, and written informed consent was obtained from each subject before data collection. The study was determined exempt by the Duke Health Institutional Review Board (Pro00105516).

The authors declare no conflict of interest.

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