Special Issue: Moral Injury

Studying moral distress (MD) and moral injury (MI) among inpatient and outpatient healthcare professionals during the COVID-19 pandemic

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Abstract

Background: COVID-19 increased moral distress (MD) and moral injury (MI) among healthcare professionals (HCPs). MD and MI were studied among inpatient and outpatient HCPs during March 2022.
Objectives: We sought to examine (1) the relationship between MD and MI; (2) the relationship between MD/MI and pandemic-related burnout and resilience; and (3) the degree to which HCPs experienced pandemic-related MD and MI based on their background.

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Methods: A survey was conducted to measure MD, MI, burnout, resilience, and intent to leave healthcare at 2 academic medical centers during a 4-week period. A convenience sample of 184 participants (physicians, nurses, residents, respiratory therapists, advanced practice providers) completed the survey. In this mixed-methods approach, researchers analyzed both quantitative and qualitative survey data and triangulated the findings.
Results: There was a moderate association between MD and MI ($r = .47$, $P < .001$). Regression results indicated that burnout was significantly associated with both MD and MI ($P = .02$ and $P < .001$, respectively), while intent to leave was associated only with MD ($P < .001$). Qualitative results yielded 8 sources of MD and MI: workload, distrust, lack of teamwork/collaboration, loss of connection, lack of leadership, futile care, outside stressors, and vulnerability.
Conclusions: While interrelated conceptually, MD and MI should be viewed as distinct constructs. HCPs were significantly impacted by the COVID-19 pandemic, with MD and MI being experienced by all HCP categories. Understanding the sources of MD and MI among HCPs could help to improve well-being and work satisfaction.

Keywords
Moral injury, moral distress, ambulatory, trauma, pandemic, COVID-19, burnout

Introduction

COVID-19 has led to unprecedented stressors for global healthcare systems and personnel due to factors such as surges in patient volume, scarcity of personal protective equipment, prolonged hospital stays, and supply chain shortages.[1,2] These challenges occurred during already stressful circumstances in healthcare that contributed to rising rates of burnout among clinicians.[3] Due to the additional exposure to stressors during the pandemic, COVID-19 has increased opportunities for moral distress (MD) and moral injury (MI) among healthcare professionals (HCPs). In this study, these 2 essential concepts, MD/MI were investigated in the context of the COVID-19 pandemic.

The concept of MD was first used to describe the institutional and external constraints hindering the moral autonomy of nurses.[4] Current definitions characterize MD as a serious compromise of an individual's moral integrity, either because 1 feels unable to act in accordance with one's core values and obligations or because attempted actions fail to achieve the desired outcome.[5,6] While nurses have been the leading focal point for most of this research, MD in physicians, respiratory therapists, and pharmacists has also been assessed. Examined, demonstrating the breadth of MD in healthcare.[8] Prior research indicates that MD is associated with burnout and intent to leave a position.[7,8]

MI occurs when one's moral or ethical beliefs have been violated repeatedly over time, leading to increased psychological, spiritual, behavioral, biological, or social distress.[9,10] MI can also result from participating in an action or not stopping an action that leads to 1 reexamining their moral beliefs.[2] Risk factors for MI include: the MI event occurring at the same time as another stressful event, the death of a patient from a vulnerable population, lack of social support, staff feeling unprepared for the emotional or psychological consequences of burnout or traumatic stress, and team members who do not take responsibility for the MI event or are not supportive of their coworkers.[2]

Although the concepts of MD/MI share some similarities, the relationship between MD/MI is unclear in the literature. Sources of MD/MI may be similar, if not identical, and both terms have been erroneously used interchangeably. Epstein and colleagues et al (2017) theorized that repeated episodes of MD result in MI.[11] In this theory, MI is a sense of residue that is long-lasting and powerfully integrated into thoughts and views of oneself and can be damaging to the self and one's career, particularly when morally distressing episodes repeat over time.[11] Litz and Kerig (2019) describe MD/MI as occurring on a continuum, with MD appearing on the less severe end of the continuum.[12]

This mixed-methods study aimed to explore the relationship between MD/MI among trauma and ambulatory HCPs in the context of the COVID-19 pandemic at 2 academic institutions in southeastern United States. It was Institutional Review Board exempted by both institutions. This research aimed to determine the relationship between MD/MI, the relationship between MD/MI and pandemic-related burnout and resilience, and whether HCPs experienced pandemic-related MD/MI differently based on their background.

Methods

Measuring MD/MI

A convergent mixed-methods approach was used to study MD/MI among HCPs. The research team collected and analyzed both quantitative and qualitative survey data and triangulated the findings.[13,14] The survey was administered to HCPs at 2 institutions. It included 4 sections: demographic information, the Measure of MD for Healthcare Professionals (MMD-HP),[8] the MI Symptom Scale-Healthcare Professionals (MISS-HP),[15] and a section containing additional items. These items were as follows: a single item measure of burnout;[16,17] 2 questions on respondents' "intention to leave" their current position due to MD; a quantitative question pertaining to resilience and the impact of the COVID-19 pandemic; and 2 open-ended questions explicitly related to MD/MI during the COVID-19 pandemic.

The MMD-HP is a 27-item scale that measures both the frequency and intensity of MD and can be used in all healthcare settings; previous studies have indicated high

internal consistency (α>.9) for the MMD-HP.[8,18] Individual scores on this scale range from 0 to 432. The MISS-HP is 10-item scale measuring MI symptoms in HCPs; acceptable internal consistency (α>.7) has been reported for the MISS-HP.[15] Individual scores on this scale range from 0 to 100.

Survey Administration

Study data were collected and managed using REDCap electronic data capture tools.[19,20] A survey link was emailed to HCPs with a reminder at week 2 and remained open for 4 weeks in March 2022, just after the height of the COVID-19 Omicron variant peak. Surveys were sent to approximately 706 people and were completed by 184 participants comprised of both inpatient and outpatient physicians, nurses, residents, respiratory therapists, and advanced practice providers (APP) for a response rate of 26%.

Quantitative Analysis

For demographic information, categorical data are presented as numbers and percentages; continuous variables are presented as means, standard deviations, and ranges. Cronbach's alphas were computed as measures of internal consistency to estimate the lower-bound reliabilities of the MMD-HP and MISS-HP. A linear regression analysis was conducted to determine the relationship between demographic characteristics and MD (MMD-HP), MI (MISS-HP), burnout, resilience, and intent to leave. All statistical analyses were conducted in Stata version 15 and SAS Enterprise Guide 8.3; a *P*-value of .05 was considered significant throughout.

Qualitative Analysis

Open-ended responses to 2 questions were collected for analysis. Individual responses were assigned a unique ID, and personal identifiers were removed. Coding and analysis were done according to the principles of the Creswell approach, specifically narrative thematic analysis.[13,21,22] Individual research members performed a line-by-line analysis of the responses to identify important phrases. Members then reviewed identified phrases together to assess for agreement. Individual research members then created codes for each of the identified phrases. After consensus was reached, a consolidated list of codes was created. Overlapping concepts and themes in the code were then organized into categories and subcategories. Research members then mapped all quotes into their designated categories to ensure accuracy. The professions of respondents were then added back to each quote. At each stage, research members first analyzed the data alone and then as a team to increase the internal validity and reliability of the data analysis. The codes and categories were brought to a review content expert

panel to assess the quality of the data analysis at each stage. Primary and secondary analysis alignment was greater than 95% within all reviews.

Results

Participant Characteristics

184 HCPs completed the survey (See Table 1). Half of the respondents reported their practice settings as inpatient/medical. A majority of the participants (67.2%) identified as women. The average age was 38.0 years (SD 10.9). Respondents reported working in their current practice setting for an average of 7.0 years (SD 8.4) and working with patients for 11.9 years (SD 10.2). At the height of the pandemic, participants spent over half of their time (53.3%) working with COVID-19 patients. (See Table 1).

Table 1. Participant characteristics (N = 184).

	n (%)
Profession	
Attending physician	28 (15.2)
APP[a]	6 (3.3)
Resident/Fellow physician	69 (37.5)
Nurse (RN, LPN)	36 (19.6)
Respiratory therapist	31 (16.8)
Other	14 (7.6)
Primary practice setting	
Inpatient/Surgical	27 (14.8)
Inpatient/Medical	91 (50.0)
ER	5 (2.7)
Outpatient	59 (32.4)
Gender identification	
Woman	123 (67.2)
Man	57 (31.1)
Transgender	0 (--)
Non-binary/non-conforming	0 (--)
Prefer not to respond	3 (1.6)
	Mean (SD), range
Age (in years)	38.0 (10.9), 22-68
Years in practice setting	7.0 (8.4), 0-45
Years working with patients	11.9 (10.2), 0-45
At the height of the pandemic, what % of your time did you spend caring for COVID-19 patients?	53.3 (34.4), 0-100

[a]APP includes nurse practitioner, clinical nurse specialist, and physician assistant.

Burnout, Intent to Leave, and Resilience

Participants were asked a single item related to burnout,[16,17] with 37.2% reporting definite burnout with 1 or more symptoms and 35.5% reporting being under stress but not feeling burned out. Using a 5-point Likert scale for this item (defined in Table 2), the mean was 2.72 (SD 0.96). Based on established criteria for scoring this item,[17] 56% of survey respondents were considered to be at risk for burnout. One survey item asked

Table 2. Burnout, intent to leave, and resilience.

	%	Mean (*SD*)
Burnout[a] (n = 183)		
Using your own definition of "burnout," please select 1 of the answers below		2.72 (.96)
(1) I enjoy my work. I Have no symptoms of burnout	8.2	
(2) I am under stress, and don't always have as much energy as I did, but I don't feel burned out	35.5	
(3) I am definitely burning out and have 1 or more symptoms of burnout, eg emotional exhaustion	37.2	
(4) the symptoms of burnout that I'm experiencing won't go away. I think about work frustrations a lot	14.8	
(5) I feel completely burned out. I am at the point where I may need to seek help	4.4	
Intent to leave (n = 127)		
Are you considering leaving your position now due to moral distress?		
Yes	21.3	
No	78.7	
Resilience [a] (n = 125)		
How has the COVID-19 pandemic affected your personal level of resilience?		2.78 (1.01)
(1) the COVID-19 pandemic has *negatively* changed my personal level of resilience. I Have decreased ability or am unable to recover from difficulties now as compared to before the COVID-19 pandemic	5.6	
(2) the COVID-19 pandemic has *somewhat negatively* changed my personal level of resilience. I Have somewhat decreased ability or am sometimes unable to recover from difficulties now as compared to before the COVID-19 pandemic	40.8	
(3) the COVID-19 pandemic has *not affected* my personal level of resilience. I Have the same ability to recover from difficulties now as compared to before the COVID-19 pandemic	29.6	
(4) the COVID-19 pandemic has *somewhat positively* changed my personal level of resilience. I Have somewhat increased or improved my ability to recover from difficulties now as compared to before the COVID-19 pandemic	17.6	
(5) the COVID-19 pandemic has *positively* changed my personal level of resilience. I Have increased or improved my ability to recover from difficulties now as compared to before the COVID-19 pandemic	6.4	

[a]Both Burnout and Resilience were considered on a 5-point Likert scale, as defined in the table (1-5).

respondents whether they were considering leaving their current position due to MD, and 21.3% indicated that they were considering leaving their current position due to MD. Participants were also asked how the COVID-19 pandemic had affected their personal level of resilience. Nearly 41% reported a somewhat negative change in resilience due to the pandemic, while 29.6% reported no change in resilience. Using a 5-point Likert scale for this item (defined in Table 2), the mean was 2.78 (SD 1.01).

MD/MI Scales

The MMD-HP scale was highly reliable (α = .94), and the MISS-HP was acceptably reliable (α = .77). MD/MI were highest among nurses (mean 167.8, SD 92.1; mean 36.98, SD 15.8 respectively) and women (mean 127.9, SD 78.9; mean 32.2, SD 15.7 respectively); in terms of practice setting, MD was highest in the emergency room (ER) (mean 178.8, SD 92.4), while MI was highest in the inpatient/medical setting (mean 34.8, SD 13.5) (See Table 3 below).

Relationship between MD/MI and Burnout, Resilience, and Intent to Leave

The correlation between MD/MI indicated a moderate but significant positive relationship between the 2 scales (r = .47, P < .001). Burnout was moderately, but

Table 3. MD (MMD-HP) and MI (MISS-HP) scores by participant characteristics.

	MD (MMD-HP)[a] (n = 99) Mean (SD), range	MI (MISS-HP)[b] (n = 150) Mean (SD), range
Profession		
Attending physician	94.7 (65.2), 13-291	23.9 (14.5), 4-61
APP[c]	74.3 (61.2), 17-161	18.7 (11.8), 4-33
Resident/Fellow physician	123.5 (63.6), 22-279	32.6 (13.2), 10-68
Nurse (RN, LPN)	167.8 (92.1), 9-334	36.98 (15.8), 3-64
Respiratory therapist	133.5 (78.98), 17-270	31.0 (13.3), 0-59
Other	45.88 (42.4), 4-115	19.2 (13.9), 5-42
Primary practice setting		
Inpatient/Surgical	125.8 (87.1), 22-291	33.1 (15.1), 15-61
Inpatient/Medical	135.8 (73.8), 13-334	34.8 (13.5), 8-68
ER	178.8 (92.4), 59-261	23.4 (17.7), 0-42
Outpatient	74.0 (44.1), 4-148	21.2 (12.8), 3-49
Gender identification		
Woman	127.9 (78.9), 7-334	32.2 (15.7), 0-68
Man	101.3 (64.1), 4-279	25.9 (11.9), 5-60

[a]MDD-HP scores range from 0-432.
[b]MISS-HP scores range from 0-100.
[c]APP includes nurse practitioner, clinical nurse specialist, and physician assistant.

significantly, associated with both MD/MI (r = .35, P < .001; r = .44, P < .001, respectively). Resilience was negatively associated with MI (r = -.29, P < .01). There was also a negative association between resilience and MD (r = -.05, P = .63), although this finding was not statistically significant. Intent to leave was moderately, but significantly, associated with MD/MI (r = .36, P < .001; r = .51, P < .001, respectively) (See Table 4 below).

Building on the correlation results, regression models for both MD/MI were formulated to allow participant characteristics to be considered (See Table 5). For MD, the model explained 34% of the variation in MMD-HP scores; the significant predictors were Surgical practice setting (P = .07), Burnout (P = .02), and Intent to Leave (P=<.001). For MI, the model explained 42% of the variation in MISS-HP scores; the significant predictors were gender (P=<.01), Surgical practice setting (P = .02), Medical practice setting (P = .04), Burnout (P=<.001), and Intent to Leave (P = .05).

Qualitative Results

Analyzing 2 open-ended questions related to sources of MD/MI during the pandemic, 8 categories and 19 subcategories were identified in the data. Among the categories, workload (n = 25) was the most referenced by respondents as a source of MD/MI. Examples supporting this category are:

> …Less personnel support to get the work done… (Attending Physician)

> Being under paid for our professional care and being shown time and time again our institute doesn't care about us. (Respiratory Therapist)

> …Our covid nurses came and did their job and should have received time off or compensation but we were mistreated… (Nurse)

Table 4. Correlation matrix for MD, MI, burnout, resilience, and intent to leave (n = 96).

	MI	MD	Burnout	Resilience	Intent to leave
MI	–				
MD	.47***	–			
Burnout	.44***	.35***	–		
Resilience	-.29**	-.05	-.33***	–	
Intent to leave	.36***	.51***	.35***	-.23**	–

~P < .10; *P < .05; **P < .01; ***P < .001.

Table 5. Regression results for moral distress and moral injury.

Moral distress (n = 90)				
	Coeff	*SE*	t	*P*
Intercept	–20.92	59.63	–.35	.73
Years working with patients	.56	1.53	.37	.71
Percent of time with COVID-19 patients	.15	.31	.49	.63
Age	–.55	1.42	–.39	.70
Gender				
Female	11.40	15.57	.73	.47
Profession[a]				
Attending physician	22.19	32.69	.68	.50
APP	–29.06	44.31	-.66	.51
Resident	35.71	33.03	1.08	.28
Nurse	45.77	38.10	1.20	.23
Respiratory therapist	1.78	37.28	.05	.96
Primary practice setting[b]				
Surgical∼	40.40	22.28	1.81	.07
Medical	29.21	21.89	1.33	.19
ER	57.38	44.28	1.30	.20
Burnout*	18.42	8.01	2.30	.02
Resilience	9.07	7.34	1.24	.22
Intent to leave***	80.75	19.73	4.09	<.001
Moral injury (n = 111)				
	Coeff	*SE*	t	*P*
Intercept	7.10	10.18	.70	.49
Years working with patients	.06	.25	.23	.82
Percent of time with COVID-19 patients	.04	.05	.76	.45
Age	-.10	.23	-.42	.67
Gender				
Female**	8.20	2.58	3.18	<.01
Profession				
Attending physician	-1.38	5.19	-.27	.79
APP	-9.63	7.57	-1.27	.21
Resident	2.99	5.22	.57	.57
Nurse	3.57	5.70	.63	.53
Respiratory therapist	-6.19	6.02	-1.03	.31
Primary practice setting				
Surgical*	9.44	3.87	2.44	.02
Medical*	7.63	3.72	2.05	.04
ER	-7.66	7.15	-1.07	.29
Burnout***	5.35	1.27	4.21	<.001
Resilience	-.86	1.20	-.71	.48
Intent to Leave∼	6.25	3.20	1.95	.05

[a]Reference group = Other Profession.
[b]Reference group = Outpatient.
∼$P < .10$; *$P < .05$; **$P < .01$; ***$P < .001$.

A prevalent subcategory identified was a lack of resources, as referenced by 8 respondents. A response from a nurse demonstrates this:

> We are asked to constantly do more while our resources dwindle, and if a patient suffers as a consequence of our lack of presence and care, the bedside nurse is the role most often penalized. (Nurse)

Fourteen respondents identified personal and family stressors as sources of MD/MI as evidenced by the following quote:

> Stressors of having school aged children during pandemic and virtual school - acting as teacher and parent as well as HCP… (Attending Physician)

Other categories and subcategories such as isolation (n = 16), distrust (n = 22), loss of connection (n = 14), and futile care (n = 21), were major and recurrent themes in survey results. The following responses represent these categories:

> …working in a warzone of struggle and death… (Respiratory Therapist)

> Dealing with very sick patients on a consistent basis and witnessing death… (Nurse)

> …Watching as people stood by the sidelines and people died from COVID - b/c they were afraid they would get infected… (Resident/Fellow)

> ...continue to torture patients even though our actions are futile… (Attending Physician)

The complete list of categories and subcategories with additional selected quotes is shown in Table 6.

Discussion

The primary finding is the establishment of a significant association between MD and MI among HCPs serving during the COVID-19 pandemic. Deeper understanding of the quantitative relationship between MD/MI is seen through participant comments. Overwhelming workloads and patient volumes along with perceived poor compensation contributed to MD/MI among all categories of HCPs. A sense of inadequate leadership, collaboration, and supplies/equipment as well as the negative impact on personal relationships and health were clearly expressed by all participants.

The pandemic's emotional impact upon HCPs was an overwhelming source of MD/MI as supported by other research.[23] Isolation, lack of trust and connection between patients and HCPs, and the massive number of deaths despite aggressive care were significant and recurrent MD/MI themes within this study.

This study is the first to measure both MD/MI among HCPs and supports the theory that, while interrelated conceptually, their moderate but significant positive inverse

Table 6. Qualitative categories, sub-categories, and example quotes.

Workload (n = 25)	
Inadequate staffing (n = 16)	Respiratory therapist: "All the while being the sole therapist for over 50 medical, ICU, ER and L&D beds…"
Unfair compensation (n = 9)	Nurse: "Other non-covid units got paid time off when we were on lockdown and the nurses got paid to stay home. Our covid nurses came and did their job and should have received time off or compensation but we were mistreated. We haven't forgotten."
Distrust (n = 22)	
Vaccinated/unvaccinated (n = 6)	Respiratory therapist: "…had to come to terms with my anger at team members who refused to be vaccinated, and at unvaccinated patients for whom we killed ourselves, knowing that they were likely going to die - and then listening to their angry families when we couldn't save them."
Us vs. them (n = 9)	Attending: "…more patients blaming healthcare industry for problems of today (went from healthcare heroes to villains within 6 months)…it is difficult to care for these patients especially when they aren't willing to be seen or go to ED because 'we will give them covid.'"
Not believing covid real (n = 7)	Nurse: "I would receive phone calls daily saying we were making up how sick our patients were, covid wasn't real, that this virus was created to kill of certain races, etc. To me when I was fighting to keep their family member alive these phone calls were defeating."
Lack of teamwork/Collaboration (n = 21)	
Refusal to provide care (n = 7)	Attending: "Having to transfer a patient out of my hospital to another facility to get care b/c some of colleagues at my hospital refused to provide the same care and told me that patient was 'not a candidate.' yet an outside hospital was eager to take the patient and provide the same care."
Loss of connection (n = 14)	
Fatigue (n = 2)	Nurse: "…6 months into the pandemic recognized I was no longer thriving and was on brink of becoming so overwhelmed I could barely recognize myself. Crying after each shift, not sleeping, nightmares, paralyzed at work when trying to manage the unmanageable, unable to eat, personal relationships taking a hit, extreme fear of getting covid."
Isolation (n = 6)	Respiratory therapist: "The feelings of being completely alone because no 1 understands except the people that work alongside you."
Failure (n = 6)	Resident/Fellow: "My heart (metaphorically) ached when loved ones could not say their goodbyes. I still feel sad that for several I could not do more to create that memory. It leads to feelings of inadequacy, impotent to provide that critical dynamic."

(continued)

Table 6. (continued)

Lack of leadership (n = 20)	
Not protecting staff (n = 2)	Resident/Fellow: "witnessing how poor a job the leadership structure at multiple institutions did at protecting their staff and students from the physical, emotional and financial aspects of covid."
Lack of resources (n = 8)	Nurse: "We are asked to constantly do more while our resources dwindle, and if a patient suffers as a consequence of our lack of presence and care, the bedside nurse is the role most often penalized."
Inadequate support (n = 10)	Nurse: "…when covid started, the administrators gave us no policies, no protocols. Other non covid units got paid time off when we were on lockdown and the nurses got paid to stay home…Covid nurses got no incentive, nothing but stupid thank you postcards from administrators…missed countless lunch breaks, you could have bought us food but when businesses sent us food you even took that away."
Futile care (n = 21)	
Dying despite extreme aggressive care (n = 8)	Nurse: "I have also experienced the trauma of keeping bodies alive…just to keep their hearts beating. This was traumatic as I watched their bodies literally decay families would not withdraw care."
Patients dying alone (n = 5)	Attending: "Patients not being able to be with their loved ones when they were at their sickest or were approaching death."
Witnessing death after death (n = 8)	Respiratory therapist: "…working in a warzone of struggle and death for 14 hours…Having to compartmentalize because your family doesn't understand or thinks 'covid isn't real.'
Outside stressors (n = 14)	
Family stressors (n = 11)	Attending: "Stressors of having school aged children during pandemic and virtual school - acting as teacher and parent as well as healthcare provider. Elderly parent who is immunocompromised and ill and taking care of them during pandemic."
Financial fallout (n = 3)	Respiratory therapist: "My husband lost his business at the start of the pandemic. I got furloughed from my position due to low census and I had to take a travel assignment…to supplement our income…to sell our 401 Ks to pay our bills…no retirement…having to pull extra shifts to pay our bills."
Vulnerability (n = 17)	
Incompetent (n = 13)	Nurse: "Feeling incompetent to do my job due to limited staffing, resources, and time."
Fear (n = 4)	Attending: "Watching as people stood by the sidelines and people died from COVID - b/c they were afraid they would get infected."

relationship (r = .47, $P < .001$) indicated that although they share some variability, MD/MI should be viewed as different constructs. Hence, and that precise measurement of these distinct concepts requires unique instruments. Although the study was not designed to specifically test this theory, a logical inference is that if one's MD goes unmitigated over time, it may lead to MI.[12,24] Furthermore, the more intense, longer the duration, and greater exposure frequency to MD and MI, the higher the probability of burnout and leaving a position and/or the profession.

The study also revealed that a high percentage of study participants (56%) were at risk for burnout, with burnout being significantly associated with both MD/MI but with relatively modest levels of association. More specifically, when participants perceived a higher level of MD (r = .35, $P < .001$) and/or MI (r = .44, $P < .001$), they were also more likely to perceive higher burnout. Thus, the higher the MD and MI, the greater the probability of burnout. MD and MI are different constructs but are related depending on the intensity/severity of the morally distressing events. MD residue builds over time and is compounded by ongoing exposure to sources/causes. MD may lead to MI depending upon the intensity and duration of these distressing sources. MI results in psychological injury and disorders such as Post Traumatic Stress Disorder (PTSD) which is not seen with MD.

Additionally, these findings contribute to the evolving conceptual literature concerning how MD/MI may be related to resilience. Among study participants, resilience was significantly negatively inverse associated with burnout, and MD/MI was moderately positively inverse associated with burnout. This finding may explain how some HCPs are not as negatively impacted by MD and MI as well as devising strategies in mitigating MD and MI. The results are similar to a 2019 study by Krautscheid and colleagues et al, which found an inverse correlation between certain aspects of resilience and MD among nursing students at 2 universities.[25] However, the results differed from those presented in a 2021 cross-sectional study by Talebian and colleagues et al, which found a positive association between resilience and MD among critical care nurses.[26] Similarly, Clark and colleagues et al (2020) found no association between resilience and MD among emergency department nurses.[26]

Our findings are similar to those of Ferreira and Gomes (2021), who found inverse relationships between burnout and resilience among physicians and nurses.[27] However, the findings are dissimilar from Shoorideh and colleagues'et al.'s (2014), which found no association between burnout and MD among critical care nurses.[28] Tetzlaff and colleagues et al (2021) found no significant association between burnout and MD among physician assistants but did find that risk of burnout was associated with increasing levels of MD.[29] A comprehensive discussion of burnout and how it relates to other concepts, such as MD, MI, is beyond the scope of this study. Taken together, the research and the cited studies indicate that the relationship between resilience, burnout and MD/MI is still evolving, which makes firm conclusions about the relationships difficult to reach. This presents a future opportunity for clearer definitions of these terms to develop more precise measurement tools.

However, the data suggest that burnout, while perhaps sharing similar characteristics, is distinct from MD/MI. This contention is supported by Cherny and colleagues et al (2015), who theorized that burnout, compassion fatigue, and MD are interrelated syndromes, each of which can lower the threshold for the development of the others.[30] Researchers posited (1) burnout occurs from stresses that arise from the clinician's interaction with the work environment, (2) compassion fatigue evolves specifically from the relationship between the clinician and the patient, and (3) MD is related to the situation in which clinicians are asked to carry out acts that run contrary to their moral compass.[30]

Nurses working during the COVID-19 pandemic showed the highest level of MD/MI and risk for burnout which is consistent with results from other studies.[31,32] and as supported by this nurse comment: This is especially evident by the following nurse comment:

> …6 months into the pandemic recognized I was no longer thriving and was on the brink of becoming so overwhelmed I could barely recognize myself. Crying after each shift, not sleeping, nightmares, paralyzed at work when trying to manage the unmanageable, unable to eat, personal relationships taking a hit, extreme fear of getting Covid.

Learners working in the pandemic environment were also shown to have higher levels of both MD/MI compared to their attending physicians or APP colleagues working in the same environment. This compares with other studies with MD/MI risk factors as younger age,[18,31] less time in practice[33] and being in a learner role in medicine.[34] This finding is consistent with Nieuwsma (2022) who showed that less empowerment in one's practice environment increases the risk for MI.[23] Residency is already stressful; therefore, it is reasonable that learners could experience higher levels of MD/MI because of these stressors. This is supported by a resident/fellow who responded, "Teaching suffers when we are in constant crisis mode, and residents and medical students suffer the downstream effects of that." This compares with other studies with MD/MI risk factors as younger age,[18,31] less time in practice[33] and being in a learner role in medicine.[34]

Limitations

A significant limitation of this study is its cross-sectional nature wherein participants reported MD/MI at a fixed point in time. The study was not designed to account for the fundamental problem of causal inference.[35] The extent of MD/MI may have impacted the results in at least 2 ways. Providers who experienced the highest levels of MD/MI may not have had the mental or emotional reserves to complete an extensive survey assessing MD/MI thus contributing to the response rate of 26% and the potential under-reporting of the presence of MD/MI. Alternatively, those experiencing the highest levels of MD/MI may have taken the opportunity to express their frustrations and perceived failures of the healthcare system, thus over-representing the extent of MD/MI. Other study limitations

include a small sample size and low response rate, both of which affect the generalizability and interpretation of results as well as limited participants in specific surveyed groups, especially in lower volumes of APPs and providers who practice in the ED and surgical settings compared to medical outpatient and inpatient environments.

Future research

Further research focused on the similarities and differences between MD/MI are warranted. The impact of gender on MD/MI is a possible area of future consideration, given the stronger predictive value of female gender and MI, but not MD. Additionally, studies designed to delineate the impact of unmitigated MD and whether this leads to MI are needed. Further exploration of the benefits of enhancing coping strategies and resilience among HCPs would be beneficial to ensure that resources are directed towards the most effective preventative action plan for the reduction of MD/MI.

Conclusion

This study shows that HCPs, including all professions and levels of training, were dramatically impacted by the COVID-19 pandemic, with MD/MI being experienced by all categories of HCPs. As the understanding of these concepts increases, the lasting impact of MD/MI on the healthcare system is an area ripe for future study. Understanding the potential sources of MD/MI between different HCPs could foster widespread culture change among healthcare systems to improve HCPs' wellbeing. Strategies need to be tailored for all HCPs with the aim of reducing MD/MI, burnout, and turnover. It is the hope that the experiences of these colleagues will contribute to a better future for all HCPs who give so much.

Author Note

All authors listed above have made substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND the drafting the work or revising it critically for important intellectual content; AND give their final approval of the version to be published; AND agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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