

Understanding moral injury in frontline healthcare professionals two years after the onset of COVID-19

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Abstract

Throughout the COVID-19 pandemic healthcare professionals have worked in morally challenging situations. The aim of this research was to investigate the predictors of moral injury in UK frontline healthcare professionals working in a variety of roles two years after the onset of the pandemic. A cross-sectional survey was conducted January 25-February 28, 2022. A total of 235 participants answered sociodemographic, employment, health, COVID-19-related questions, and the 10-item Moral Injury Symptom Scale - Healthcare Professional version. Nearly three-quarters had experienced moral injury. Twelve significant predictors of moral injury were entered into a backward elimination binominal logistic regression. The final model included five independent predictors that explained 25.4% variance in moral injury ($\chi^2(5, N=235) = 45.7, p < 0.001$). Odds of moral injury were significantly raised in young healthcare professionals (<31 years), smokers, and those reporting low workplace confidence, not feeling appreciated, and feeling burned out. The findings support interventions to relieve moral injury in frontline healthcare professionals.

Keywords

Moral distress; coronavirus; healthcare worker; logistic regression; mental health.

Introduction

The UK reported its first case of the new coronavirus disease which became known as COVID-19 on 29th January 2020. Consequently, over the next 20 months three national lockdowns as well as a raft of other social distancing measures were implemented to control the spread of the coronavirus and reduce the evident strain on UK healthcare. The healthcare sector has been, and remains, pushed to capacity. In the first months there was a severe shortage of the required personal protective equipment (PPE) for healthcare professionals (HP) as well as resources, such as ventilators, they use to meet the demands of treating people with COVID-19 (Liddell et al., 2020). In turn, HP have reported demands for them to enter high risk environments without adequate PPE, alongside facing other morally challenging situations with no choice but to breach their ethical and moral codes (Iserson, 2020). The ethical code of HPs includes a *duty of care* despite a level of risk to themselves (McDougall et al., 2020). Similarly, the Code of Ethics for Emergency Physicians asserts the importance of courage when working in high-stake environments, with specific mention of infectious disease. Moreover, the Hippocratic Oath states that doctors will care for patients to the best of their ability. These professional values often form the moral backbone of HPs (Antoniou et al., 2010). Despite this, professional codes have the status of guidelines so they cannot be taken as absolute, even in potentially life-threatening situations. For this reason, HPs have been faced with many moral dilemmas during the COVID-19 pandemic such as whether to continue frontline work or whether to protect themselves and their family (Menon and Padhy, 2020), and being required to decide between patients when distributing scarce life-saving resources (Feinstein et al., 2020). Research has highlighted the mental health struggles, specifically moral distress, experienced by HPs during the peak of the pandemic (Greenberg et al., 2020). However, there is much less evidence of the lasting psychological effects of the pandemic on HPs, particularly regarding moral injury.

Moral injury has been defined as “a deep sense of transgression including feelings of shame, grief and meaninglessness, remorse from having violated core moral beliefs” (Brock and Lettini, 2012, p. xiv). In 2020, The British Medical Association forewarned that moral injury could become the leading consequence of the pandemic amongst HP (BMA, 2020). However, research in the field of moral injury has generally focused on the experiences of war veterans (Litz et al., 2009; Litz and Kerig, 2019). Nonetheless, through the narrative of fighting the pandemic is like fighting a war, the concept of moral injury which has mainly been used to explore sequelae for war veterans has been recognised as particularly relevant for understanding potential outcomes for HP during the pandemic. A key development in furthering investigations in this field was the validation of a version of the Moral Injury Symptom Scale for health professionals (MISS-HP) (Mantri et al., 2020). Using the scale, Mantri et al. (2021a) conducted a study exploring the predictors and prevalence of moral injury in 181 US HP. Their findings identified that a history of mental illness, younger age, clinician burnout, lower/no religiosity, and working in the profession for less time were all significant predictors of moral injury. These findings lay the foundation within the discipline. Two subsequent cross-sectional studies by this lab in April and October 2020 (Mantri et al., 2021b), at the beginning of the pandemic, replicated the pre-pandemic North Carolina study in an undifferentiated global sample (Mantri et al., 2021a), and a substantial survey study in mainland China also found that reports of moral injury were associated with HP burnout, psychological distress and low levels of well-being (Wang et al., 2022).

Relevant published literature on understanding moral injury in HP in the UK during the pandemic is limited. There are studies have identified increased rates of mental disease including depression, anxiety and COVID-19 related traumatic stress in HP (Gilleen et al., 2021), and in frontline health and social care workers (Greene et al., 2021). A qualitative study of the lived experiences of 18 nurses from eight European countries including the UK described emotional and ethical challenges during the first wave of the pandemic (Melnikov

et al., 2022). There is also a succinct report of a systematic review that yielded four papers that examined moral injury in HP which concluded that moral injury awareness training is required to prepare the workforce for working in the context of COVID-19 and other disasters (Williams et al., 2021). This suggests that there is a need to understand predictors of moral injury in HP working on the frontline to be able to provide targeted interventions in due course. A pertinent study is that of Wanigasooriya et al. (2021) who explored the predictors and prevalence of mental health symptoms in UK HP after the first peak of COVID-19 (in the UK). They found that moral dilemmas were involved in the raised prevalence of common mental health issues in UK HP. Their study assessed the impact of 24 identified 'exposure variables' on HP experiences of depression, anxiety, and post-traumatic stress disorder. They found that sociodemographic factors, current health status, lifestyle factors (e.g., weekly smoking), workplace factors (e.g., availability of PPE), impact of COVID-19 on professional life (e.g., morally uncomfortable changes in the work) and personal life factors (i.e., a diagnosis of COVID-19) contributed to the development of mental health symptoms in HP. Wanigasooriya et al.'s (2021) study provides a set of relevant predictors to explore moral injury, using the MISS-HP, in UK HP even though we cannot assume that their predictors will translate directly from mental illness to moral injury. COVID-19 remains a hazard for HP as the pandemic has become prolonged though various mutations of the coronavirus, despite a successful vaccination programme. Further, since the onset of the pandemic, globally there has been subsequent peaks and nurses have reported feeling more fatigued and distressed in what feels like never ending pandemic conditions (Čartolovni et al., 2021).

Altogether, the literature directly identifies several predictors of moral injury. Smith-MacDonald et al. (2018) argued that religiosity/spirituality provides individuals with a source of trust and hope which can protect them from moral injury and promote recovery. However, Currier et al. (2014) found that individuals with high religious affiliation set higher moral standards for themselves. Similarly, Wang et al. (2021) suggested that HP with a high

religious affiliation have a heightened sense of incongruence and self-condemnation when faced with morally challenging situations. Additionally, there are conflicting findings regarding the effect of living with others during the pandemic (Smith and Victor, 2019). On one hand, cohabiting HP suffer from psychological distress due to role conflict (Foli et al., 2021), specifically the need to fulfil their job role and keep their family safe (Yang et al., 2020). However, on the other hand, the social support provided through cohabitation can reduce stress, anxiety, and depression (Chew et al., 2020; Spoorthy et al., 2020). Additionally, there are theoretically supported predictors of mental illness in HP, that have not been explored in relation to moral injury. To illustrate: Mantri et al. (2021a) identified burnout as the greatest predictor of moral injury, and Kwon and Akar (2021) reported that female HP experience greater moral injury compared to their male counterparts. This, however, could be related to the typical cohabiting scenario in which females take on more housework which is also physically demanding. There is also research which points to a positive impact of scheduled breaks (Young et al., 2021) and workplace confidence (Owens and Keller, 2018) on reducing nurses' stress levels. Additionally, Smallwood et al. (2021) reported that there are psychological benefits from a positive community perception and appreciation amongst HP.

The above discussion of the literature indicated a need to understand moral injury in the UK HP at a later stage of the pandemic. Thus, the aim of the current study was to examine the prevalence and predictors of moral injury in UK HP two years since the first recorded case of COVID-19. This was achieved using a survey consisting of the MISS-HP and 18 pre-determined predictors were derived from the literature.

Methods

Participants and Procedures

This cross-sectional study used Qualtrics to create and distribute an anonymous online survey to collect data to investigate moral injury in HP. Participants were recruited during the period

January 25-February 28, 2022. Information about the study and a link to the survey was placed on social media platforms used by HPs. Eligible participants were 18+ years and had worked for at least 33 weeks as a frontline HP. This included employment in a variety of roles: the requisite criterion was that the working environment included direct contact with patients with COVID-19 (Danet, 2021) for at least 33 weeks since March 2020, when COVID-19 was formally identified as a pandemic. Exclusion criteria included individuals not working on the frontline, working in the social care sector, having to isolate themselves at home during the pandemic, and/or suffering from a serious mental health condition. A total of 355 participants gave informed consent and joined the research. There were 106 submitted surveys that were incomplete, and 14 surveys were from non-frontline workers, so these were removed. This provided a final sample of 235 participants (210 F, 25 M) ranging in age from 18 to 70 years old.

Measures

A 31-item survey was used. This consisted of 18 predictor variables: five sociodemographic (age, sex, relationship status, religion, cohabiting), four related to working conditions (years of experience, working hours increased, redeployment, getting scheduled breaks), five health-related (mental health conditions, physical health conditions, accessed well-being support, smoking, burnout), and four COVID-19-related (feeling appreciated, workplace confidence, adequate PPE, positive COVID-19 test). Thirteen predictors were used in the Wanigasooriya et al. (2021) study. Burnout was measured using the 2-Question Summative Score (Li-Sauerwine et al., 2020). One question explored emotional exhaustion and the other depersonalisation. Both were scored on a 6-point Likert scale and the average provided the summative score (0-6). Based on the cut-offs determined by Li-Sauerwine et al. a score >3 indicted burnout, and accordingly burnout scores were dummy coded according to the published cut-off (burnout, no burnout). The five remaining predictor variables were

developed by the authors based on other literature (religious belief, cohabitation, getting scheduled breaks, feeling appreciated, workplace confidence). Age was assessed using five categories (18-30, 31-40, 41-50, 51-60, 61-70) for an initial examination of the relationship of age to moral injury, and then, to confirm the findings of Mantri et al (2021a, b) the age data were dichotomised to young (18-30 years), and older (31+ years). Thus, all the predictor variables were dichotomously scored (yes/no).

Moral injury was assessed using the Moral Injury Symptom Scale - Healthcare Professional version (MISS-HP) (Mantri et al., 2020). This measure consists of ten theoretically grounded dimensions of moral injury (betrayal, guilt, shame, moral concerns, loss of trust, loss of meaning, unforgiveness, self-condemnation, feeling punished by God, loss of religious faith). The ten scale items were each scored on a 10-point Likert scale, ranging from 'strongly disagree' (1) to 'strongly agree' (10). Scores for items 5-7 and 10 were reversed for continuity. Total scores ranged from 10-100 with a high score indicating high moral injury. Mantri et al.'s (2020) receiver operating characteristic curve suggested ≥ 36 as a suitable cut-off for caseness, reporting 84% sensitivity and 93% specificity in identifying symptoms of moral injury. Prior to analysis, the MISS-HP scores were dummy coded according to caseness (no moral injury, moral injury). Overall, the MISS-HP has good psychometric properties (Mantri et al., 2021b). The MISS-HP also has an additional item exploring the impact of moral injury on daily life on a 5-point Likert scale ranging from 'not at all' to 'extremely'.

Data Analysis

Tests to determine normality were undertaken and parametric or non-parametric analyses were performed as appropriate, then descriptive statistics were generated to explore the frequency of each predictor, and the prevalence of moral injury. A Kruskal-Wallis analysis of variance with Dwass-Steel-Critchlow-Fligner pairwise comparisons was conducted to

examine the influence of age. Correlation analyses determined the relationships between each predictor and MISS-HP score. Finally, binomial logistic regression analyses using backward elimination informed by likelihood ratio tests were conducted to explore the contribution of independent significant predictors. Statistical significance for all analyses was set at the conventional $\alpha \leq 0.05$.

Results

A total of 169 of the 235 HP scored ≥ 36 on the MISS-HP. This indicated that moral injury was seen in 71.9% of this convenience sample of UK HP. Participants reported that their moral injury caused moderate (25.5%), very much (8.1%), or extreme (2.6%) problems with family, social, or occupational functioning.

Normality tests and descriptive statistics for all variables are shown in Table 1. A Kruskal-Wallis test found a significant main effect of age on moral injury ($\chi^2 = 25.6 (4), p < 0.001, e^2 = 0.11, N = 235$). Dwass-Steel-Critchlow-Fligner pairwise comparisons showed a significant difference in moral injury (MISS-HP) between age groups 18-30 ($M = 45.6, SD = 12.4$) and 41-50 ($M = 38.2, SD = 10.7$), and between 18-30 and 51-60 ($M = 37.5, SD = 10.4$), however, there were no other age group differences. Moral injury was greatest in those HP aged 18-30.

Table 1. Frequency, mean and standard deviation of MISS-HP score of predictors

Predictor	Category	N (%)	Mean (range 10-100)	SD	Shapiro Wilk <i>p</i>
Age (18-30)	Yes	66 (28.1)	39.7	12.8	<0.01
	No (Older)	169 (71.9)	45.6	12.4	<0.01
Sex	Female	210 (89.4)	44.1	13.0	0.85
	Male	25 (10.6)	36.1	9.08	0.08
Relationship	In	169 (71.9)	41.4	12.3	0.32
	Not	66 (28.1)	47.8	13.3	0.85
Religious	Yes	80 (34.0)	41.9	13.5	0.63
	No	155 (66.0)	43.9	12.5	0.89
Cohabitation	Yes	158 (67.2)	42.9	13.2	0.61
	No	77 (32.8)	43.9	12.3	0.88
Duration	>10 years	83 (35.3)	39.3	12.1	0.16
	≤ 10 years	152 (64.7)	45.3	12.8	0.85
Increased Hrs	Yes	179 (76.2)	44.3	12.7	0.68
	No	56 (23.8)	39.7	12.8	0.60
Redeployed	Yes	66 (28.1)	43.7	13.5	0.14
	No	169 (71.9)	43.0	12.7	0.46
Breaks	Yes	145 (61.7)	41.6	12.6	0.97
	No	90 (38.3)	45.8	13.0	0.04
Mental Health	Yes	93 (39.6)	45.8	13.0	0.53
	No	142 (60.4)	41.5	12.6	0.29
Physical Health	Yes	66 (28.1)	42.4	13.0	0.41
	No	169 (71.9)	43.5	12.9	0.86
Support	Yes	53 (22.6)	44.5	13.3	0.46
	No	182 (77.4)	42.9	12.8	0.09
Smoking	Yes	30 (12.8)	49.9	13.1	0.93
	No	205 (87.2)	42.2	12.6	0.59
Burnout	Yes	77 (32.8)	50.2	13.3	0.91
	No	158 (67.2)	39.8	11.3	0.72
Appreciated	Yes	120 (51.1)	39.5	12.3	0.85
	No	115 (48.9)	47.1	12.4	0.41
PPE	Yes	153 (65.1)	41.9	13.5	0.45
	No	82 (34.9)	45.7	11.4	0.49
COVID-19	Yes	128 (54.5)	44.0	13.5	0.63
	No	107 (45.5)	42.3	12.1	0.90
Confidence	Yes	178 (75.7)	41.9	12.6	0.75
	No	57 (24.3)	47.4	12.9	0.49

Bivariate correlations explored the relationship between each of the 18 predictor variables and the MISS-HP score. As shown in Table 2, younger age, being female, not being in a relationship, < 10 years in profession, no scheduled breaks, mental illness, smoking, not

feeling appreciated, working increased hours, inadequate PPE, burnout, and lacking confidence were significantly associated with moral injury.

Table 2. Correlations of moral injury and predictors

Predictor	MISS-HP
Age	0.24***
Sex	-0.19**
Relationship Status	0.22***
Duration	0.22***
Breaks	0.13*
Mental Health	-0.16*
Smoking	-0.20**
Feeling Appreciated	0.29***
PPE	0.14*
Burnout	0.38***
Confidence	0.19**
Hours	-0.15*

All Pearson's r values except *age* and *breaks* (Spearman's ρ).

* $p \leq .05$, ** $p < .01$, *** $p < .001$

The twelve significant predictors were entered into a backward elimination binominal logistic regression model using likelihood ratio tests (LRT) to determine which predictors contributed the greatest variance to moral injury. Analysis of collinearity confirmed that there were no issues with the variance inflator factor or tolerance, indicating the validity of including all the predictors in the analysis. The initial model was significant (χ^2 (12, N= 235) = 51.2, $p < 0.001$) and explained 28.2% variance (Nagelkerke's $R^2 = 0.282$). Backward elimination was applied until only variables with significant Chi-square statistics from the LRT remained. The final model yielded five significant predictors of moral injury in HP (χ^2

(5, N= 235) = 45.7, $p < 0.001$): younger age, feeling burned out, lacking confidence, smoking, and not feeling appreciated (see Table 3). The model explained 25.4% variance.

Table 3. Binominal logistic regression analysis (backward elimination using Likelihood Ratio Tests)

Predictor	χ^2	df	<i>p</i>	Odds Ratio	95% CI (lower)	95% CI (upper)
Age	8.76	1	0.003	2.59	1.37	4.89
Burnout	7.48	1	0.006	2.94	1.30	6.65
Confidence	6.84	1	0.009	0.33	0.13	0.81
Smoke	5.97	1	0.015	4.08	1.13	14.73
Feeling Appreciated	5.20	1	0.023	0.47	0.25	0.91

Discussion

This study explored the prevalence and predictors of moral injury in UK HP two years after the onset of COVID-19. The findings replicated and extended those of Mantri et al (2020, 2021a,b) and Wanigasooriya et al. (2021). According to the cut-off validated by Mantri et al. (2020), nearly three-quarters of our sample were experiencing moral injury. This finding supports Mantri et al.'s assertion that moral injury is an outcome of working in healthcare. Moreover, in Mantri et al.'s 2020 study, about a quarter of HP indicated at least a moderate impact of moral injury on their daily functioning, whereas in the current study prevalence was higher with more than a third reporting at least a moderate impact of moral injury. This outcome supports Mantri et al.'s argument that the pandemic has exacerbated the prevalence of moral injury.

The logistic regression identified five main predictors of moral injury: lacking workplace confidence, feeling appreciated, smoking, burnout, and aged 18-30 years. To the best of our knowledge this comprehensive study is the first to investigate workplace confidence and feeling appreciated as predictors of moral injury in HP, and these two variables now add to the understanding of moral injury in the literature. Interestingly, there was a relationship between confidence and adequate PPE which suggests that feeling protected at work supports confidence in HP. In this UK sample, 2 years after the onset of the pandemic, it remains that HPs who lacked workplace confidence were more likely to report moral injury than those who felt confident. Similarly, participants who indicated that they felt unappreciated were more likely to report moral injury compared to those who reported feeling appreciated. Smallwood et al. (2021) argued that there is a relationship between feeling appreciated and psychological distress. Not feeling appreciated was thus investigated in this study although it has not been considered as a predictor of moral injury before. We suggest further research is required in this area. This finding adds to the general evidence-based need to provide workplace support and appreciation as a part of managing risks for work-related stress (Cousins et al., 2004).

Burnout was identified as one of the main predictors of moral injury in this study. HP reporting burnout were nearly three times more likely to report moral injury than those who did not report burnout. This finding corresponds with two investigations of moral injury and burnout in American samples of HP (Mantri et al., 2021a, b), which implicated pandemic-induced burnout as contributing to the significant increase in moral injury seen in two separate samples of HP. As all studies were cross-sectional this does not provide sufficient evidence of cause and effect. Regardless, the results suggest that interventions to reduce burnout, even if the cause is multi-factorial, will support a reduction in moral injury.

Altogether, burnout must be seen as an issue that should be tackled because it also poses an increased risk for medical errors and malpractice (De Hert, 2020).

HP aged 18-30 years were over two and a half times as likely to report moral injury than their older colleagues. Likewise, Mantri et al. (2021b), and Nieuwsma et al. (2022) found that moral injury was related to younger age amidst reported COVID-19 exposure. Neither of these studies provided a strong reason for why this may be. A scoping review that included an exploration of the role of age in terms of vulnerability indicators for moral injury in healthcare workers during COVID-19 (Riedel et al., 2022) noted that the reason why younger HP should be more vulnerable was not at all clear, especially as some pre-COVID-19 studies indicated that older workers were more at risk. Reidel et al. suggested that as lower levels of work experience are seen in younger workers, and this may mean they had less accumulation of learning from coping with previous moral stressors in the workplace. The notion that age may be a protective factor from surviving previous traumatic experiences should be explored in further studies. In this study, we included duration of employment as a predictor variable, and this 'previous experience' variable was significantly associated with moral injury, but also to age. The role of experience in moral injury could be investigated further using finer interval scales and also using qualitative studies. We also acknowledge that there are differences in sampling across studies and that participants in this study had been frontline HP exposed to COVID-19 for a lengthy period.

The significant predictors of moral injury in the current study can be mapped onto the predictors of post-traumatic stress disorder, anxiety, and depression identified by Wanigasooriya et al. (2021). Interestingly, Wanigasooriya et al. (2021) reported that HP experiencing morally challenging situations were 50% more likely to suffer from symptoms of anxiety and/or depression, and around two-thirds more likely to suffer from PTSD. Altogether, evidence is building that moral injury is a precursor to and predictor of mental

illness, and that providing targeted interventions to ameliorate moral injury with improve HP mental health and clinical performance.

It was expected that HP working increased hours would report increased moral injury, however no difference was found. These findings could reflect the severity and prevalence of morally injurious events rather than duration of exposure. That is, regardless of working hours many HP were forced to make morally challenging decisions associated with protecting loved ones alongside fulfilling their high-risk role (Spoorthy et al. 2020). Moreover, during the pandemic HP were seen by the public as one occupational group, regardless of their hours of work. HP reports of feelings of stigma and a threat to the public, exacerbating distress and isolation, are not titrated according to hours worked (Taylor et al., 2020). That said, additional research is needed to explore this further as we did not investigate the number of hours worked, but simply the influence of increased hours. The prediction that redeployment would heighten HP moral injury was not supported. Caution is required in dismissing this variable as a potential risk factor in other situations, because working in the context of the COVID-19 pandemic changed ways of working, and was a new experience for all HP.

Unlike Wanigasooriya et al.'s (2021) findings, this study did not identify accessed wellbeing support as a predictor of moral injury. Distinguishing between the studies, Wanigasooriya et al. asked whether the individual had 'access' to wellbeing support, whereas this study asked if the person had 'accessed' support. This distinction provided an insight into the effectiveness of the support accessed by HP, particularly as effective support has been found to minimise distress and long-term challenges (Williamson et al., 2021). However, the results could indicate that the support was not effective, which could be due to the limited knowledge surrounding moral injury in HP (Cai et al., 2020). Similarly, the limited understanding of the pandemic and scarcity of resources have made it difficult to offer appropriate long-term psychological support.

This study found that contracting COVID-19 was not a significant predictor of moral injury conducted two years after the start of the pandemic. This is in contrast to the findings of Wanigasooriya et al. (2021) who found that the symptoms of PTSD and anxiety were increased amongst HP whose self or close other had been admitted to hospital with COVID-19, one year earlier. This is difficult to reconcile, especially as just over half of our participants reported that they had received a positive result from a COVID-19 test. A potential explanation for the differing findings is that in this study the question referred only to the participants themselves, whereas Wanigasooriya et al extended their question to other family members. Some HP experienced role conflict if they felt unable to keep their family safe because of their work (Foli et al., 2021; Yang et al., 2020), and similarly if loved ones became ill then HP may believe they have exposed their loved ones to the virus (Sachdeva et al., 2021). In this study, this extension was not included.

Cohabitation and religiosity were explored to address the ambiguity within the literature (e.g., Smith and Victor, 2019), however neither predictor was significant. Cornelius et al. (2021) found that cohabiting HP often reported a duty to keep their family safe, and that they may distance themselves from their loved ones. HP living alone were unlikely to form a social 'bubble' in order to keep loved ones safe. Therefore, it seems that all HP experienced limited social connections inside and outside of work during the pandemic (Mihaylaya et al., 2020). Regarding religiosity, the MISS-HP was the first scale to incorporate questions in this area alongside moral injury. Using this scale, Mantri et al. (2021a) identified religious affiliation as a significant predictor of moral injury, but it was not seen in our UK sample. The questions related to religion within the MISS-HP specify 'God' and ask participants to rate whether their 'religious/spiritual faith has been strengthened'. Some religions use a different term which may provide a reason for the difference in findings between studies. There are, however, different views of the role of religious faith in the literature. Some see it as an

additional burden (Wang et al., 2021) whereas for others it provides hope (Smith-MacDonald et al., 2018).

This study extended the literature in moral injury in healthcare and the findings can be utilised to improve HP experiences. All of the significant predictors of moral injury are amenable to intervention. Educational training may boost the confidence of HP, specifically those with less time in the profession, thereby reducing their risk of moral injury. Other strategies could involve demonstrations of consistent appreciation from the public and senior individuals. As mentioned, it is crucial that appreciation remains consistent as inconsistency can lead to adverse consequences (Wood and Skeggs, 2020).

The current study has several strengths. First, it is one of the earliest studies to utilise the MISS-HP to explore the predictors of moral injury in UK HP. Second, this study contributes to the understanding of moral injury outside of the well-studied population of war veterans and draws much-needed attention to moral injury within healthcare. Encouragingly, feedback from participants highlighted the importance of exploring moral injury and one participant reported that “herself and her colleagues found the study interesting and were pleased it was conducted”.

Study Limitations There are limitations which should be addressed in future studies. One challenge is that the current study did not distinguish between the HP different roles with the profession. This was because the emphasis was moral injury from the risk of disease from frontline working in multidisciplinary healthcare situations. This is a common feature in this literature as making a distinction between the job roles of those regularly working in a frontline environment where they are potentially exposed to COVID-19 has been seen as less relevant than ensuring the sample was confined to this type of health professional. Moreover, some early studies on moral injury in HP examined the different roles in frontline HP separately and found almost equal odds for functional impact of moral injury (e.g. Mantri et

al., 2021b). This does not negate the point that larger studies which have the power to illustrate which sectors and professions within the healthcare sector, if any, experience the greatest levels of moral injury, would be a useful advancement in due course.

Additional challenges are that the findings cannot account for individuals that had to leave their role due to pandemic-induced challenges. The reasons will have been varied. We suggest that some will be stress-related, and altogether it is likely that the prevalence of moral injury could be even higher. Also, this was not a longitudinal study, and so we have not been able to statistically demonstrate an increase in moral injury from onset to two years after the pandemic. Nevertheless, the evidence of the prevalence of moral injury, and the evidence of the involvement of particular predictors indicates a need for intervention to reduce the high levels of moral injury. That is, now there is clear cross-sectional evidence of the high prevalence of moral injury in frontline HP from several studies in different parts of the world, there is a need for research using qualitative methodologies to explore the experiences of frontline HP, and explain their needs. There is also a need for longitudinal intervention studies to ameliorate the mental disease that emerges from moral injury.

Finally, the 70% survey completion rate in this convenience sample presents a weakness. This completion rate, however, is typical of survey response rates in HP (Liu and Wronski, 2018) and higher than other studies that have sent out web survey invitations to HP during the COVID-19 pandemic (Pierce et al., 2021).

Conclusion This study provides evidence of high levels of moral injury in frontline UK HP two years after the onset of the COVID-19 pandemic and adds to the global literature on the effect of the pandemic on HP mental disease. Younger age (18-30 years), burnout, low workplace confidence, smoking, and not feeling appreciated were variables identified as significant risk variables that should be targeted in the development of interventions to reduce moral injury in HP against the long-term consequences of the pandemic. Our findings

contribute to understanding the need to risk assess for moral injury, which impacts on individual mental health, sickness absence, turnover of HP and patient care.

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