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# Understanding moral injury and its predictors among Chinese physicians

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## Abstract

**Background** Moral injury – the betrayal of one's moral and professional values – is a negative factor affecting physicians' wellbeing. However, few studies have examined moral injury and its predictors in healthcare professionals. Therefore, this study aimed to explore the prevalence, associated factors, and predictors of moral injury in Chinese physicians.

**Methods** This study was a cross-sectional survey conducted from September 14 to October 27, 2023, in mainland China. A total of 549 physicians completed the online self-administered questionnaire through the WeChat app. The 10-item Moral Injury Symptom Scale-Health Professional (MISS-HP) was used to assess the severity of moral injury symptoms, and the Moral Injury Events Scale (MIES) was used to measure exposure to potentially morally injurious events (PMIEs).

**Results** The results of the study showed a mean score of 42.07 (SD = 13.67) for the MISS – HP, and the prevalence of moral injury among the physicians was 31.6%. The multiple linear regression identified five main predictors of moral injury: exposure to PMIEs, job satisfaction, lack of organizational support, witnessing patient suffering or death, and mental health needs.

**Conclusions** Chinese physicians reported experiencing different types of PMIEs and suffering from moral injury-related symptoms in their clinical practice. It helped to understand modifiable risk factors for moral injury, highlighting the need for systemic interventions. Healthcare institutions can mitigate moral injury and safeguard the wellbeing of healthcare workers by building peer-support networks, improving communication to address workload issues, and implementing recognition systems for ethics.

**Keywords** Moral injury, Potentially morally injurious events, Wellbeing, Mental health, Moral distress, Physicians

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## Background

Moral injury (MI), an interdisciplinary construct, has increasingly drawn scholarly attention in recent years. Rooted in the concept of Survivor's Guilt [1], the moral injury was formally conceptualized by Shay as a betrayal of what is right [2]. In the medical field, especially during the COVID-19 pandemic, healthcare workers faced high-risk situations. Physician burnout and distress were concerns even before the pandemic [3, 4]. Physicians often encounter ethical decision-making dilemmas in complex clinical situations, which were worsened during the pandemic due to strained healthcare resources [5, 6]. This has led to more research on the mental health of healthcare professionals. Healthcare workers not only bear work-related physical and psychological stress but also need to maintain professionalism and empathy, yet their needs are often overlooked [6, 7]. The concept of moral injury has made scholars focus on their vulnerability [8]. The *International Code of Medical Ethics* emphasizes safeguarding healthcare workers' health, and regarding their wellbeing as a core value can help healthcare systems respond to challenges and guide decision-making [9].

The moral injury construct offers a new way of analyzing clinician distress. It differs from burnout as it focuses on systemic rather than individual causes [3]. It specifically refers to the moral dissonance that occurs when clinicians' ability to provide ethically ideal care conflicts with operational realities, especially resource scarcity and institutional constraints [6]. Constant exposure to potentially morally injurious events (PMIEs), which are acts that violate deeply held moral beliefs [10], may cause severe psychological problems. These include guilt, shame, self-condemnation, and a breakdown in interpersonal trust, along with fundamental changes to one's moral worldview [11, 12]. Research has demonstrated that exposure to PMIEs, especially when combined with personal traumas like bereavement, can cause long-lasting emotional harm [13, 14], affecting mental health and wellbeing [15, 16].

Recent evidence suggests that moral injury can result in consequences at personal, interpersonal, and systemic levels [17]. It is associated with depression, anxiety, suicidality, and posttraumatic stress disorder [15, 18–21]. Beyond individual health issues, moral injury potentially inflicts damage to healthcare quality, clinical judgment, patient-provider trust, and ethical practice [17]. Despite growing research, current studies mainly focus on the manifestations of moral injury rather than its causes [18]. Preliminary evidence shows that many factors influence moral injuries, such as demographics (gender, age), occupational variables (specialty, seniority), psychological traits (moral resilience, self-criticism), and systemic factors (organizational support, job satisfaction) [15, 22–28]. This shows the need to systematically study the predictors of moral injury for targeted prevention strategies.

While research on moral injury is growing, limitations still exist in current studies. First, the advancement of objective measurement frameworks remains constrained by conceptual ambiguity and the absence of standardized diagnostic criteria [29]. While the Moral Injury Symptoms Scale–Health Professional (MISS-HP) by Mantri et al. serves as the predominant assessment tool cross-nationally [20, 26, 30–35], its cross-cultural validity—particularly in non-Western contexts—remains underexplored, raising questions about psychometric generalizability. Second, current moral injury research mainly hinges on Western cultural and religious backgrounds. Litz's model [29], for example, has been chiefly validated in religious societies. Previous studies have indicated that Chinese healthcare workers with religious beliefs account for a small proportion [19]. Confucianism and collectivism have exerted a profound influence on Chinese culture and also have an impact on people's moral behaviors [36, 37]. Confucian collectivism and hierarchical healthcare system stressors (e.g., high patient-provider ratios, public hospital funding constraints) may lead to different moral injury causes. Western-derived predictors (e.g., religiosity, spirituality) lack validity in such settings, and instrument biases (e.g., MISS-HP's faith-based constructs) reduce their applicability in China's professional environment.

Empirical research on moral injury with physicians as the research subjects remains extremely limited, representing a research gap in this field. While much empirical literature addresses moral distress and moral injury in nursing populations [11], comparable scholarship focusing on physicians remains underdeveloped. Therefore, the present study has three primary objectives. First, it seeks to validate moral injury assessment tools in non-Western professional settings, specifically within the context of Chinese medical practice, to enhance the cross-cultural applicability of these tools. Second, by utilizing relevant scales, this research attempts to determine the prevalence of moral injury and its associated predictors among Chinese physicians, considering the unique Chinese cultural background. Finally, based on the identified factors related to moral injury, the study will put forward targeted strategies and recommendations to address moral injury, which can be utilized to protect the wellbeing of medical staff.

Furthermore, the findings of this study may have implications for broader healthcare systems. Although the research is centered on Chinese physicians, the underlying mechanisms of moral injury, such as the influence of workload and other systemic pressures like high patient-provider ratios, as well as factors such as organizational support, on moral injury, may be relevant in

other healthcare settings. This research has the potential to inform the development of preventive strategies for moral injury in medical personnel globally, thus providing an objective basis for safeguarding the physical and mental health of medical staff worldwide.

## Methods

### Sample and data collection

The survey was carried out from September 14 to October 27, 2023, through the online survey platform WenJuanXing (https://www.wjx.cn/). A link to the online questionnaire was sent to potential participants via China's most popular social media platform, WeChat. Respondents were encouraged to forward the questionnaire link to their colleagues and post it on social media. The questionnaire was completed anonymously. The inclusion criteria were as follows: 1) practicing physicians or interns, or regulated physicians; 2) practical experience ≥ 3 months; and 3) informed consent and voluntary signing of the informed consent form. The exclusion criteria were as follows: 1) medical students without clinical practice experience; and 2) inability to use the internet or other mobile devices due to vision or other disabilities preventing completion of an online questionnaire.

To guarantee sample diversity, we exerted concerted efforts during the recruitment phase. Our study encompassed healthcare institutions of varying sizes throughout China, ranging from primary medical facilities to regional level-2 medical institutions and large provincial and municipal-level medical centers. Respondents were recruited from multiple provinces in mainland China, such as Heilongjiang in the northeast, Xinjiang in the northwest, Guangdong in the south, and Beijing in the north, thereby representing a broad geographical spread. Regarding medical specialties, the sample incorporated physicians from internal medicine, surgery, pediatrics, obstetrics and gynecology, and a variety of other subspecialties. This diversity within the medical fields enabled us to capture a comprehensive spectrum of experiences associated with moral injury. In terms of demographics, we achieved a balanced representation across different age groups, spanning from novice physicians in the early stages of their careers to more experienced professionals. In addition, the sample included physicians with different job titles. To further evaluate the diversity of respondents, we initially analyzed the data upon its receipt. If any particular group appeared to be underrepresented, we implemented follow-up measures. For instance, we targeted specific regions or medical specialties by extending additional WeChat group invitations or sending direct messages to relevant professional associations. A total of 549 physicians provided informed consent and completed the questionnaire. During the data-cleaning process, 128 invalid questionnaires were excluded, resulting in a final sample of 421 physicians included in the analysis. The sample efficiency rate was 76.68%.

### Ethics approval

This study received ethical approval from the Ethics Committee of Harbin Medical University Health System Hospital (Approval No. HMUIRB2023036). Before questionnaire administration, all participants provided electronic informed consent via the WenJuanXing platform. Stringent confidentiality protocols were implemented throughout WeChat-based recruitment and data collection processes. The WenJuanXing platform ensured respondent anonymity by design, with encrypted data transmission and storage systems preventing unauthorized access. Recruitment communications explicitly stated that no personally identifiable information would be collected or linked to responses. All data were aggregated and analyzed exclusively for research purposes in anonymized form, with additional safeguards to protect participant privacy.

### Measures

#### *Explanatory variables*

Explanatory variables considered in this study were gender(Male/Female), age (categorized as ≤ 25, 26–35, 36–45 and ≥ 46), marital status (Unmarried/Married), educational attainment(Technical secondary school/Undergraduate/Master's degree/PhD), whether expected revenues are being met (No/Yes), length of practice(categorized as ≤ 5, 6–15, 16–25 and ≥ 26), hospital level (primary medical institutions, regional level 2 medical institutions, provincial and municipal level 3 medical institutions), job title(to be assessed Internship and training/Primary/Intermediate/Deputy senior/Advanced), department (Internal Medicine/Surgical/Obstetrics and Gynecology/Pediatrics/ICU/Emergency Department/Other Departments), whether in a managerial position (No/Yes), frequent overtime work (No/Yes), feeling overworked (No/Yes), and receiving any support from family or friends (No/Yes).

Job satisfaction was measured on a 3-point Likert scale ranging from 1 (dissatisfied) to 3 (extremely satisfied).

Referring to previous studies, PMIEs include incidents of workplace violence, medical errors, and witnessing patient deaths [13]. In this study, we listed several PMIEs in clinical practice. Workplace violence was assessed by asking: “Have you ever been attacked by your patients or their close relatives, either physically or verbally?” Medical errors and disputes were assessed by asking: “Have you experienced medical errors or medical disputes?” Witnessing significant patient suffering or death was assessed by asking: “Have you ever witnessed a patient suffer or die?” Media pressure and public opinion were assessed by asking: “Do you feel that public opinion is

pressurized and leads to tensions between doctors and patients?" Response categories were no or yes.

Mental health needs were assessed by asking: "Do you need professional help to relieve psychological stress?". Response categories were no or yes.

Organizational support was related to physicians' moral injury [38], and physicians' perceived level of organizational support was assessed by asking: "Do you think your organization is reasonably safeguarding your safety and wellbeing, especially when dealing with medical disputes?". Response categories were no or yes. When respondents answered "No," this indicated a lack of organizational support.

Exposure to PMIEs was measured with the adapted version of the Moral Injury Events Scale (MIES), which was developed by Nash et al. [39]. This scale has been used to assess the prevalence and perceived intensity of PMIEs in healthcare workers in healthcare settings [40, 41]. MIES consists of three factors: transgressions by self, transgressions by others, and betrayal by others [42]. Responses are measured on a 6-point Likert scale of 1 (strongly disagree) to 6 (strongly agree). Total scores range from 9 to 54. Higher scores indicate greater exposure to and/or impact of morally injurious events. The item wording was modified to reflect the healthcare population based on the existing military version of the MIES adjustments. Specifically, on item 7 'leaders' was changed to 'superiors', item 8 'fellow service members', was adapted to 'fellow colleagues', and on item 9 'others outside the US military' was adapted to 'others outside the healthcare system' (defined as patients, their families and society at large).

#### *Adaptation and validation of the Moral Injury Events Scale for Healthcare Professionals (MIES-HP)*

The Chinese adaptation of the MIES-HP was developed through Brislin's translation model and standardized cross-cultural adaptation guidelines [43, 44], involving three-round collaborative reviews by medical ethicists, clinically experienced scholars, and linguistic experts. The iterative process encompassed forward translation, back-translation, and cultural adaptation of the original instrument (see Supplementary Materials for bilingual versions). The psychometric evaluation revealed strong internal consistency (Cronbach's $\alpha = 0.82$). Content validity was established via multi-round expert validation, while a preliminary survey of 50 healthcare professionals refined survey instruments and identified potential implementation challenges before formal data collection. Exploratory factor analysis (EFA) confirmed the structural validity of the Chinese MIES-HP, demonstrating alignment with the original instrument's three-factor framework [42].

The translation team addressed cultural nuances through two primary strategies. First, they utilized bilingual expertise, with translators being bilingual experts possessing medical domain knowledge, enabling context-sensitive modifications. For example, relationship-related items were adjusted to mirror workplace hierarchies and colloquial expressions in Chinese clinical settings. Second, they emphasized contextual relevance, where a panel of medical ethicists and clinicians evaluated cultural congruence during the adaptation process to ensure that items aligned with China's collectivist values, authority structures, and unique physician–patient dynamics, thus safeguarding conceptual equivalence while allowing for localized interpretations of morally injurious events.

#### *Outcome measure*

The primary outcome, moral injury symptom severity, was assessed using the 10-item Moral Injury Symptom Scale–Health Professional (MISS-HP) originally validated for U.S. healthcare professionals by Mantri et al. [30]. Following cross-cultural adaptation by Wang et al. [35], the Chinese version was administered to physicians in this study. Each item employs a 10-point Likert scale (1 = strong disagreement to 10 = strong agreement), yielding a total score of 10–100, where higher scores reflect greater moral injury severity. Notably, Item 10 ("religious/spiritual faith") was modified to "professional beliefs/spiritual faith" to align with China's healthcare context, where religious adherence among medical personnel remains limited [19]. This adaptation aimed to evaluate moral injury's impact on clinicians' vocational convictions. The scale demonstrated acceptable internal consistency (Cronbach's $\alpha = 0.73$), and good validity [30, 35]. Clinical significance was determined using a 5-point Likert framework [30], categorizing functional impairment in occupational, relational, and psychosocial domains. Responses of moderate, very much, or extremely denoted clinically meaningful distress.

#### *Statistical analysis*

Data analysis was conducted using IBM SPSS Statistics 26. Descriptive statistics characterized participant demographics, work-related variables, and exposure to PMIEs. MISS-HP scores were reported as means ± standard deviations across subgroups. Between-group differences in MISS-HP scores were evaluated using Mann–Whitney U and Kruskal–Wallis tests. Moral injury prevalence was calculated based on established clinical thresholds. Pearson's correlation coefficient quantified the association between MIES-HP and MISS-HP scores, elucidating relationships between PMIE exposure and symptom severity. Multiple linear regression analysis modeled MISS-HP scores (dependent variable) against demographic, occupational, and PMIE-related factors (independent

variables). Variables demonstrating significance ($p < 0.05$) in bivariate analyses were incorporated into the final model via stepwise selection. Multicollinearity was assessed using variance inflation factors (VIF; acceptable range: 1.05–1.19). Regression assumptions (linearity, homoscedasticity, independence, normality) were verified through residual analysis, with trend-level significance defined as $0.05 < \alpha < 0.10$.

## Results

### Descriptive statistics

As shown in Table 1, a total of 421 physicians completed the survey. The mean score of the MISS-HP was 42.1(SD = 13.67) among the participants, and 26.6% ($N = 112$) of respondents had moral injury-related clinically significant distress and impaired functioning. The demographic characteristics of the participants are as follows: the majority were female, accounting for 57.0%; the largest age group was 26–35 years old, representing 29.5% of the sample. Married individuals constituted 57.7% of the total, and 45.6% of the physicians held an undergraduate degree. Most of them (76.7%) were from provincial and municipal level 3 medical institutions, and 84.1% reported not meeting their expected income. Additionally, 33.7% of the physicians self-reported a need for professional counseling to alleviate psychological stress. Among the respondents, 74.8% had an intermediate or lower job title, 45.4% had ≤ 5 years of practice experience, 45.8% worked in the internal medicine department, and 86.9% did not hold managerial positions.

### Prevalence of MIES-HP and its relationship with MISS-HP

In the current sample, MIES-HP scores ranged from 9 to 49, with a median score of 26.00 and a mean score of 26.07(SD = 8.49), and 48.0% ($N = 202$) of the physicians in the sample scored above the median. Table 2 presents a detailed overview of the various PMIEs endorsed by participants, including transgressions by self, transgressions by others, and betrayal by others.

As depicted in Table 3, a highly significant moderate positive correlation was observed between the total score of the MIES-HP and that of the MISS-HP (r = 0.61, $P < 0.001$). Moreover, each dimension of the MIES-HP, such as transgressions by self, transgressions by others, and betrayal by others, also exhibited significant positive correlations with the MISS-HP. The correlation coefficients (r) for these dimensions ranged from 0.21 to 0.55, all with $P < 0.001$. This set of correlations implies that an increment in the MIES-HP scores, whether in the overall assessment or within specific dimensions, is accompanied by a corresponding increase in the MISS-HP scores. Fundamentally, physicians who encounter more frequent or severe moral injury-related events, as quantified by the MIES-HP, are more likely to experience heightened levels of moral injury-related distress and functional impairment, as indicated by their MISS-HP scores.

### Bivariate analyses

Bivariate analysis results indicated that several factors were significantly associated with moral injury (all $p$ values < 0.05; Table 1). Specifically, male gender, not meeting income expectations, lack of organizational support, frequent overtime work, feeling overworked, and lower job satisfaction were all linked to higher MISS-HP scores. Physicians who required professional assistance for psychological stress relief, had experienced workplace violence, medical errors or disputes, witnessed patient suffering or death, and felt pressured by public opinion and doctor-patient relationship tensions also had significantly elevated MISS-HP scores. In contrast, variables such as age, marital status, educational attainment, hospital level, job title, department, and whether in a managerial position did not show a significant association with moral injury in this analysis (all $p$ values < 0.05; Table 1).

### Regression analyses

A multiple linear regression model was constructed to identify predictor variables with a significant influence on the MISS-HP scores. Sociodemographic and work-related characteristics of the participants that were found to be associated with moral injury symptoms (Table 1) at a significance level of $p < 0.05$ were incorporated into the multiple linear stepwise regression models. Additionally, the MIES-HP scores were included as independent variables in the multiple linear regression model for predicting moral injury (Table 4). In the final regression model, several factors were significantly associated with moral injury symptom scores (MISS-HP): MIES-HP scores, job satisfaction, lack of organizational support, witnessing patient suffering or death, and mental health needs.

Each one-unit increase in MIES-HP scores correlated with a 0.81-point elevation in MISS-HP scores ($\beta = 0.81$, $p < 0.001$). This indicates that the more exposed physicians are to PMIEs, the more severe their moral injury symptoms are likely to be.

Measured on a 3-point Likert scale (1 = dissatisfied, 2 = satisfied, 3 = extremely satisfied), a one-unit improvement in job satisfaction reduced MISS-HP scores by 4.2 points ($\beta = -4.2$, $p < 0.001$). For instance, physicians transitioning from a baseline rating of "dissatisfied" (1) to "satisfied" (2) exhibited a 4.2-point decrease in symptom severity, highlighting job satisfaction's protective role against moral injury progression.

Witnessing patient suffering or death increased the MISS-HP score by 3.23 points ($\beta = 3.23$, $p = 0.019$). This finding suggests that the emotional toll of observing patients in distress or dying contributes significantly to moral injury among physicians. For example, a physician

**Table 1** Participant characteristics and bivariate analysis ($N=421$)

| Characteristics | *n* | % | MISS-HP score | | |
|---|---|---|---|---|---|
| | | | Mean | SD | *P* |
| Total | 421 | 100 | 42.07 | 13.67 | |
| Moral injury severity level | | | | | |
| Clinically insignificant distress | 309 | 73.4 | 39.64 | 13.13 | |
| Clinically significant distress | 112 | 26.6 | 48.78 | 12.91 | |
| Gender | | | | | |
| Male | 181 | 43.0 | 44.85 | 13.39 | **< 0.001** |
| Female | 240 | 57.0 | 39.97 | 13.53 | |
| Age (years) | | | | | |
| ≤ 25 | 111 | 26.4 | 39.7928 | 12.74086 | 0.138 |
| 26–35 | 124 | 29.5 | 42.3065 | 13.39347 | |
| 36–45 | 95 | 22.6 | 43.5684 | 15.45319 | |
| ≥ 46 | 91 | 21.6 | 42.956 | 13.00761 | |
| Marital status | | | | | |
| Unmarried | 178 | 42.3 | 41.78 | 13.19 | 0.583 |
| Married | 243 | 57.7 | 42.28 | 14.03 | |
| Educational attainment | | | | | |
| Technical secondary school | 41 | 9.7 | 44.20 | 12.21 | 0.582 |
| Undergraduate | 192 | 45.6 | 41.41 | 13.88 | |
| Master's degree | 152 | 36.1 | 41.87 | 13.64 | |
| PhD | 36 | 8.6 | 44.00 | 14.30 | |
| Whether expected revenues are being met | | | | | |
| No | 354 | 84.1 | 42.79 | 13.05 | **0.027** |
| Yes | 67 | 15.9 | 38.27 | 16.13 | |
| Length of practice | | | | | |
| ≤ 5 | 191 | 45.4 | 40.85 | 12.90 | 0.376 |
| 6–15 | 97 | 23.0 | 42.77 | 14.88 | |
| 16–25 | 63 | 15.0 | 43.79 | 14.39 | |
| ≥ 26 | 70 | 16.6 | 42.86 | 13.30 | |
| Hospital level | | | | | |
| Primary medical institutions | 65 | 15.4 | 43.34 | 12.43 | 0.327 |
| Regional level 2 medical institutions | 33 | 7.8 | 44.70 | 11.19 | |
| Provincial and municipal level 3 medical institutions | 323 | 76.7 | 41.54 | 14.11 | |
| Job title | | | | | |
| Internship and training | 144 | 34.2 | 40.92 | 12.69 | 0.445 |
| Primary | 93 | 22.1 | 43.42 | 13.53 | |
| Intermediate | 78 | 18.5 | 41.26 | 13.36 | |
| Deputy senior | 56 | 13.3 | 41.66 | 16.08 | |
| Advanced | 50 | 11.9 | 44.60 | 14.19 | |
| Department | | | | | |
| Internal Medicine | 193 | 45.8 | 42.53 | 13.28 | 0.085 |
| Surgical | 67 | 15.9 | 41.15 | 13.93 | |
| Obstetrics and Gynecology | 23 | 5.5 | 36.48 | 13.12 | |
| Pediatrics | 21 | 5.0 | 49.71 | 10.37 | |
| ICU | 21 | 5.0 | 43.76 | 14.32 | |
| Emergency Department | 15 | 3.6 | 41.00 | 15.83 | |
| Other Departments | 81 | 19.2 | 41.09 | 14.17 | |
| Whether in a managerial position | | | | | |
| No | 366 | 86.9 | 41.86 | 13.54 | 0.433 |
| Yes | 55 | 13.1 | 43.49 | 14.56 | |
| Frequent overtime work | | | | | |
| No | 154 | 36.6 | 38.07 | 13.86 | **< 0.001** |
| Yes | 267 | 63.4 | 44.37 | 13.03 | |

**Table 1** (continued)

| Characteristics | *n* | % | MISS-HP score | | |
|---|---|---|---|---|---|
| | | | Mean | SD | *P* |
| Feeling overworked | | | | | |
| No | 147 | 34.9 | 37.87 | 13.42 | **< 0.001** |
| Yes | 274 | 65.1 | 44.32 | 13.29 | |
| Receiving any support from family or friends | | | | | |
| No | 60 | 14.3 | 45.67 | 14.99 | 0.110 |
| Yes | 361 | 85.7 | 41.47 | 13.36 | |
| Job satisfaction | | | | | |
| Dissatisfied | 75 | 17.8 | 50.44 | 12.79 | **< 0.001** |
| Satisfied | 294 | 69.8 | 41.70 | 12.23 | |
| Extremely satisfied | 52 | 12.4 | 32.10 | 15.40 | |
| Workplace violence | | | | | |
| No | 97 | 23.0 | 37.03 | 13.28 | **< 0.001** |
| Yes | 324 | 77.0 | 43.58 | 13.44 | |
| Medical error or dispute | | | | | |
| No | 229 | 54.4 | 39.7 | 13.04 | **< 0.001** |
| Yes | 192 | 45.6 | 44.89 | 13.90 | |
| Witnessing patient suffering or death | | | | | |
| No | 71 | 16.9 | 35.63 | 14.52 | **< 0.001** |
| Yes | 350 | 83.1 | 43.37 | 13.13 | |
| Self-perception of whether public opinion is pressurized | | | | | |
| No | 42 | 10.0 | 34.17 | 15.55 | **< 0.001** |
| Yes | 379 | 90.0 | 42.94 | 13.18 | |
| Mental health needs | | | | | |
| No | 279 | 66.3 | 40.03 | 13.29 | **< 0.001** |
| Yes | 142 | 33.7 | 46.08 | 13.55 | |
| Lack of organizational support | | | | | |
| No | 109 | 25.9 | 34.66 | 13.45 | **< 0.001** |
| Yes | 312 | 74.1 | 44.66 | 12.79 | |

Moral injury severity level: "not at all" and "seldom" indicate insignificant distress; "moderate," "very much" and "extremely" indicate clinically significant distress and impairment in functioning

who has witnessed more patient suffering or death episodes during their practice is likely to have a higher MISS-HP score, indicating more severe moral injury symptoms.

Perceived lack of institutional support, particularly in resolving medical disputes or ensuring safety, elevated MISS-HP scores by 3.33 points ($\beta = 3.33$, $p = 0.007$). This shows that a supportive work environment is crucial for mitigating moral injury. If an organization fails to provide adequate support, physicians are more likely to experience heightened moral injury symptoms.

Physicians reporting unmet psychological support needs exhibited MISS-HP scores 2.37 points higher than their counterparts ($\beta = 2.37$, $p = 0.030$). This highlights the connection between mental health struggles and moral injury, suggesting that unaddressed mental health issues may exacerbate moral injury symptoms.

Details of the multiple linear regression model can be found in Table 4. In contrast, other independent variables included in the initial model did not reach statistical significance during the stepwise integration of predictor variables. Due to their low significance, these variables were removed from the linear regression model.

## Discussion

This study investigated the prevalence and predictors of moral injury among Chinese physicians. Findings reveal that Chinese physicians experience different types of PMIEs in their clinical practice, 64.40% of respondents agreed that they had seen something that was morally wrong, and participants scored high in reporting transgressions by others (items 1 and 2 of the MIES-HP). The mean MISS-HP score ($42.07 \pm 13.67$) exceeded values reported in the U.S. (36.8) [22], Pakistani (37.7) [24], European (32.31) [33], Honduran (34.80) [31], and Iranian (35.76) [45] cohorts, though lower than China's initial pandemic wave (46.9) [35]. Using a cutoff of $\geq 50$ for clinically significant distress [19], 31.6% of participants met the criteria for moral injury. However, diagnostic variability across populations underscores caution in interpreting thresholds, given the absence of standardized diagnostic criteria [19, 20, 30, 33, 34].

**Table 2** Participants' answers to the adapted moral injury events scale assessing PMIEs ($N=421$)

| | Score prevalence(N; %) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **M** | **SD** | **Strongly Disagree** | **Moderately Disagree** | **Slightly Disagree** | **Slightly Agree** | **Moderately Agree** | **Strongly Agree** |
| I saw things that were morally wrong | 3.75 | 1.53 | 49 (11.6%) | 60 (14.3%) | 41 (9.7%) | 112 (26.6%) | 115 (27.3%) | 44 (10.5%) |
| I am troubled by having witnessed others' immoral acts | 3.98 | 1.45 | 33 (7.8%) | 55 (13.1%) | 36 (8.6%) | 108 (25.7%) | 141 (33.5%) | 48 (11.4%) |
| I acted in ways that violated my own moral code or values | 1.93 | 1.15 | 201 (47.7%) | 121 (28.7%) | 42 (10.0%) | 43 (10.2%) | 12 (2.9%) | 2 (0.5%) |
| I am troubled by having acted in ways that violated my own morals or values | 2.6 | 1.62 | 151 (36.0%) | 97 (23.0%) | 40 (9.5%) | 55 (13.1%) | 59 (14.0%) | 19 (4.5%) |
| I violated my own morals by failing to do something that I felt I should have done | 2.66 | 1.48 | 125 (29.7%) | 100 (23.8%) | 61 (14.5%) | 73 (17.3%) | 53 (12.6%) | 9 (2.1%) |
| I am troubled because I violated my morals by failing to do something I felt I should have done | 2.97 | 1.58 | 107 (25.4%) | 83 (19.7%) | 56 (13.3%) | 84 (20.0%) | 72 (17.1%) | 19 (4.5%) |
| I feel betrayed by superiors who I once trusted | 2.65 | 1.45 | 118 (28.0%) | 110 (26.1%) | 59 (14.0%) | 84 (20.0%) | 37 (8.8%) | 13 (3.1%) |
| I feel betrayed by fellow colleagues who I once trusted | 2.55 | 1.37 | 117 (27.8%) | 119 (28.3%) | 71 (16.9%) | 74 (17.6%) | 30 (7.1%) | 10 (2.4%) |
| I feel betrayed by others outside the healthcare system who I once trusted | 2.98 | 1.55 | 94 (22.3%) | 95 (22.6%) | 62 (14.7%) | 91 (21.6%) | 54 (12.8%) | 25 (5.9%) |

**Table 3** Correlation analysis between MIES-HP and MISS-HP ($N=421$)

| Variable | Mean | SD | MISS-HP score | |
|---|---|---|---|---|
| | | | r | *P* value |
| MISS-HP score | 42.07 | 13.67 | | |
| MIES-HP score | 26.07 | 8.49 | 0.61 | < 0.001 |
| Transgressions by self | 10.16 | 4.69 | 0.53 | < 0.001 |
| Transgressions by others | 7.73 | 2.68 | 0.21 | < 0.001 |
| Betrayal by others | 8.18 | 3.81 | 0.55 | < 0.001 |

r = Pearson correlation coefffcient

In Western settings, religiosity often plays a significant role in how individuals cope with moral injury [12, 29]. Religion provides a set of values, beliefs, and a sense of community that can help people process moral distress. In China, alternative coping mechanisms rooted in its cultural context are more prominent. Chinese culture emphasizes collectivism, family values, and social harmony [36, 37]. When facing moral injury, physicians may rely more on their social support networks, including family, friends, and colleagues, for emotional support. For example, family gatherings or discussions with close friends can serve as a platform for physicians to express their feelings and gain perspective. Additionally, Confucianism, which emphasizes kindness, compassion, and respect for others [36, 37], may influence how Chinese physicians perceive and deal with moral issues. They may draw strength from these cultural values to adhere to ethical principles in the face of moral dilemmas. However, this also means that when family and social support systems are insufficient, Chinese physicians may face greater challenges in dealing with moral injury. Healthcare institutions need to be aware of these cultural differences and develop support programs that align with Chinese cultural values. In the future, healthcare institutions should collaborate with academic institutions to further study culture-specific moral injury triggers (e.g., hierarchical decision-making, familial pressures) for targeted policy-making.

Bivariate and regression analyses revealed that multiple factors influence moral injury among Chinese physicians. The multiple regression identified five predictors: exposure to PMIEs, job satisfaction, lack of organizational support, witnessing patient suffering or death, and mental health needs. In the regression, MIES-HP scores predicted moral injury symptoms. As expected, more exposure to PMIEs led to more severe symptoms. Due to the medical profession's nature, physicians often face moral distress [46], such as resource distribution and work-life balance. The pandemic worsened these issues as high-stakes decisions are common. Specific medical experiences linked to PMIEs, like resource constraints, medical errors, administrative stress, and institutional betrayal [6, 13, 47], are associated with moral injury. Our finding that workplace violence, medical errors, and witnessing patient suffering increase moral injury aligns with prior studies [6, 19, 22]. It is recommended that hospital administrators offer additional support to physicians who have recently undergone these negative events, to help them cope with any negative emotions that might emerge.

In addition, the present study's results revealed a significant association between moral injury and gender, with male physicians exhibiting more severe moral injury symptoms compared to their female counterparts. This finding stands in contrast to previous research, which has generally indicated higher levels of moral injury among female individuals [19, 24]. This difference might be attributed to the fact that, compared with men, women tend to be more inclined to actively seek social support and express their emotional distress. As previously indicated by research, due to their more frequent social connections and greater emotional investment in relationships, women are more likely to perceive and experience social support, which promotes mental health [48, 49]. Female healthcare workers can buffer the negative impacts of moral injury through interpersonal interactions with colleagues, friends, etc. For example, when facing moral distress, women often turn to their social networks, to share their feelings and experiences. This serves as an important means of emotional catharsis. Conversely, influenced by gender-role norms, men are

**Table 4** Results of the stepwise multiple linear regression model

| | Unstandardized Coefficients | Std Error | Standardized Coefficients | Sig | 95.0% Confidence Interval for B | |
|---|---|---|---|---|---|---|
| | B | | Beta | | Lower Bound | Upper Bound |
| Constant | 23.354 | 3.107 | | 0.000 | 17.248 | 29.461 |
| MIES-HP score | 0.806 | 0.065 | 0.501 | 0.000 | 0.679 | 0.933 |
| Job satisfaction | −4.244 | 0.985 | −0.170 | 0.000 | −6.180 | −2.308 |
| Lack of organizational support | 3.331 | 1.237 | 0.107 | 0.007 | 0.900 | 5.762 |
| Witnessing patient suffering or death | 3.234 | 1.379 | 0.089 | 0.019 | 0.524 | 5.944 |
| Mental health needs | 2.370 | 1.089 | 0.082 | 0.030 | 0.229 | 4.512 |

This table reports the results of our main statistical analysis ($N=421$). Unstandardized coefficients explain how much the MISS-HP value increases for one step on the scale of the variable that is shown in the first row. ($F=64.662$; $p<0.001$; $R=66.2\%$; $R^2=43.8\%$; adjusted $R^2=43.1\%$)

more prone to suppressing their emotions. The masculine role, typically characterized by independence and rationality, restricts men's behaviors of seeking help, expressing emotions, and disclosing themselves. This emotional suppression may lead to the exacerbation of moral injury symptoms. Despite the difference between the present study's results and previous ones, it highlights the need for further empirical research on gender differences in moral injury.

Moral injury symptoms are tied to lower resilience and social support [25, 27, 50], harming mental health [21]. Our study found that 33.7% of physicians had mental health needs, with these individuals showing more severe moral injury symptoms, consistent with previous research [15, 16]. Physicians and organizations should prioritize psychological needs. Therefore, both physicians themselves and healthcare organizations should pay greater heed to the psychological needs of physicians. Physicians are advised to develop an understanding of self-care strategies and actively seek support from their organizations [51]. Our study found that lack of support and low job satisfaction significantly predicted high moral injury levels, in line with prior work [8, 22, 52]. Resource constraints, urgent clinical demands, and a perfectionist institutional culture frequently result in leadership oversight of staff physical and mental wellbeing, neglecting fundamental human needs such as psychological safety and work-life equilibrium [52, 53].

PMIEs in healthcare settings encompass institutional transgressions that violate professionals' moral/ethical expectations, including superiors' failure to assume accountability, systemic neglect of employee support, and organizational betrayal [6, 47]. In this study, 31.80% of participants reported betrayal by trusted superiors, while 27.10% cited breaches of trust by colleagues. These findings align with prior evidence demonstrating that moral injury frequently arises from ruptured physician-system relationships and eroded institutional trust [38]. Reestablishing trust between healthcare professionals and organizations, combined with cultivating supportive workplace conditions, may mitigate moral injury severity [54].

Insufficient organizational support and excessive workloads compromise healthcare professionals' capacity to deliver high-quality patient care [8], eroding their professional identity. In this study, 63.4% of physicians reported frequent overtime, while 65.1% described work overload, indicating sustained occupational strain even in the post-COVID-19 era. Scholarly consensus posits that moral distress and injury originate not from individual failings but from systemic healthcare system deficiencies [3, 6]. These findings underscore the imperative for healthcare organizations to implement structural reforms that foster supportive workplace environments and mitigate systemic contributors to clinician harm [6, 7].

#### Systemic and societal interventions

*The International Code of Medical Ethics* emphasizes the dual obligation of physicians to prioritize self-care while engaging institutional support systems [9]. Healthcare administrators should institutionalize policies that safeguard clinician wellbeing, aligning leadership practices with ethical imperatives to mitigate systemic stressors such as occupational stigmatization and resource inequities [55]. In addition, healthcare professionals should be taught self-care strategies and encouraged to seek professional help when necessary [56, 57]. We found that as many as 90% ($N = 379$) of the respondents perceived that public opinion was stressful and led to tensions in the doctor-patient relationship and that this factor was significantly associated with moral injury. Studies have shown that stigmatization is one of the stressors for healthcare workers and that misinformation on social media is an obstacle for healthcare workers to safeguard their wellbeing [58, 59].

Collaborative initiatives between healthcare institutions and media outlets are critical to fostering constructive public discourse. During crises, media campaigns should disseminate evidence-based narratives highlighting medical professionals' challenges and achievements, counteracting stigmatization and misinformation. For example, spotlighting clinicians' efforts during pandemics can rebuild public trust and mitigate moral injury risks exacerbated by negative perceptions. In addition to media campaigns, long-term collaborative efforts can be established. Healthcare institutions can provide media outlets with regular updates on medical research and the overall state of the healthcare system. In return, media organizations can develop public education programs explaining clinical decision-making complexities, therapeutic limitations, and healthcare workers' roles. These initiatives enhance a layperson's understanding of medical practice, alleviating unrealistic patient expectations and subsequent clinician stress.

#### Actionable recommendations for healthcare institutions

This study demonstrates that diminished job satisfaction, inadequate organizational support, and unaddressed mental health needs significantly predict elevated moral injury levels among Chinese physicians. These evidence-based predictors provide critical insights for hospital administrators to develop targeted interventions protecting clinician wellbeing. To effectively mitigate moral injury and enhance workforce resilience, healthcare institutions can implement the following multilevel strategies. First, cultivating a supportive organizational culture through structured peer-support systems proves

essential. As evidenced by prior studies [60, 61], healthcare workers-specific peer-support groups effectively reduce psychological distress while strengthening professional resilience. Such programs serve as platforms for processing adverse events, managing workplace stressors, and counteracting burnout [62]. We propose implementing monthly case-based discussion forums where clinicians collaboratively analyze moral dilemmas encountered in practice. These sessions enable reciprocal knowledge sharing, emotional validation, and community building—all demonstrated to enhance professional fulfillment [60]. Particularly following sudden adverse events in clinical work, timely activation of peer-support networks helps restore procedural justice perceptions and workplace trust through collective sense-making [63–65]. This collegial scaffolding not only diminishes isolation but also enhances ethical decision-making capacity during crises [63, 64].

Second, institutional leadership should establish bidirectional communication channels to identify and address systemic stressors proactively. Implementing quarterly town hall meetings complemented by confidential consultation mechanisms allows real-time detection of operational pressures like unsustainable workloads. Frontline clinician input should directly inform workload redistribution protocols and policy reforms. For instance, implementing dialog training enhances team communication, trust-building, and shared decision-making—critical components for maintaining clinical capacity during crises [66].

Third, comprehensive recognition systems should incentivize ethical practice alongside clinical excellence. Empirical evidence confirms that achievement-based reward structures significantly enhance professional satisfaction [67]. Beyond traditional clinical metrics, institutions should formally recognize ethical decision-making, patient-centered care innovations, and workplace culture contributions through multiple reward modalities (e.g., merit-based promotions, and public commendations). Establishing an "Ethical Practice Excellence Award" could reinforce positive norms while fostering professional pride-dual mechanisms that enhance perceived organizational support and reduce moral injury risks.

Moreover, for individual-level interventions, resilience training can be introduced. Research has shown that resilience training has a positive impact on an individual's mental health, subjective wellbeing, and psychological and physiological outcomes [68]. Medical organizations should establish in-house services specifically dedicated to providing psychological counseling for their employees. Acceptance and Commitment Therapy (ACT) and Cognitive Behavioural Therapy (CBT) are regarded as effective in alleviating the stress experienced by medical staff and maintaining their mental health [69]. For clinicians experiencing moral injury, cognitive restructuring techniques help reframe traumatic experiences [12]. Research has indicated that Eye Movement Desensitization and Reprocessing (EMDR) may serve as a valuable psychotherapeutic approach to alleviate the psychological and emotional consequences stemming from traumatic events (such as encountering dying and deceased patients) experienced by healthcare workers [70].

#### Areas for future research

Several specific areas warrant further investigation. First, the long-term effects of moral injury on physician retention should be studied. High levels of moral injury may lead to burnout, job dissatisfaction, and ultimately, healthcare workers leaving the profession [71]. Research can explore the factors that influence whether a morally injured physician will stay in the profession or leave, such as the availability of support systems, career development opportunities, and the overall work environment. Second, the impact of moral injury on patient outcomes needs more in-depth study. Morally injured physicians may be less engaged in patient care, which could potentially affect patient satisfaction, treatment compliance, and even clinical outcomes. Longitudinal studies can track the relationship between physician moral injury and patient outcomes over time. Third, future research can focus on the effectiveness of different intervention strategies. Comparing the impact of organizational-level interventions, such as creating a supportive work environment, with individual-level interventions, like providing counseling services, can help determine the most effective approach to reducing moral injury. Fourth, given the influence of cultural factors on moral injury, cross-cultural research can be conducted to compare the experiences and coping mechanisms of physicians in different countries and cultures, which can provide valuable insights for developing universal and culturally-specific intervention strategies.

#### Strengths and limitations

One of the strengths of this study is that it explores the factors associated with moral injury among Chinese physicians in the post-COVID-19 pandemic. Our findings provide a solid foundation for developing interventions for moral injury among healthcare workers after the crisis period. Secondly, to our knowledge, this study is the first to empirically investigate PMIEs among Chinese physicians using an adapted MIES. This expands the concept of moral injury's adaptability in different cultures and aids in understanding moral injury among Chinese medical professionals. Notably, this study validates the MISS-HP among Chinese physicians. Both MIES-HP and MISS-HP can be used as objective and measurable

tools to assess moral injury. They help identify high-risk groups and design targeted interventions, providing a reliable basis for future research and practice in this field.

Several aspects of the present study limit the generalizability and interpretation of the findings. First, the convenience sampling method via WeChat may introduce biases. Selection bias can occur since the sample is restricted to WeChat-accessible and willing participants. Older physicians, less active on WeChat, may be underrepresented. Also, if respondents share the questionnaire link within their networks, certain specialties or regions may be overrepresented. These biases can undermine the generalizability of results, as they may not reflect the entire Chinese physician population, especially those with limited social media access or from underrepresented subgroups. To minimize these biases to the greatest extent possible, proactive measures were implemented. These measures included promoting the widespread dissemination of the questionnaire link across diverse WeChat groups related to the medical field. These groups encompassed various specialties, geographical regions, and levels of professional experience, aiming to achieve a more representative sample. Second, in this study, a translated and adapted MIES was used, and the reliability and validity of the scale need to be further generalized and validated. Third, the cross-sectional nature of this study precludes causal inferences. As data is gathered at one point in time, we can't tell if moral injury symptoms cause lower job satisfaction and higher stress, or the other way around, or if there's a two-way relationship. Future longitudinal studies are needed to clarify the causal mechanisms and temporal sequence. Additionally, future research should explore the complex interactions among the identified predictors. For example, how job satisfaction mediates the effect of organizational support on moral injury is unclear. Understanding these interactions will help develop more targeted interventions for moral injury.

## Conclusions

This study examined the prevalence and predictors of moral injury among Chinese physicians. The prevalence of moral injury among the physicians in this study was 31.6%, and physicians reported experiencing different types of PMIEs and suffering from moral injury-related symptoms in their clinical practice. Exposure to PMIEs, job satisfaction, lack of organizational support, witnessing patient suffering or death, and mental health needs have been identified as predictors of physician moral injury. These factors should be considered when developing interventions to address moral injury among physicians. In conclusion, to alleviate moral injury and ensure the wellbeing of physicians, a multi-faceted approach involving healthcare professionals, organizations, and society is required. By implementing the recommended strategies and conducting further research, we can better understand and address the issue of moral injury in the medical field.

### Abbreviations

| | |
|---|---|
| ANOVA | One-way analysis of variance |
| COVID-19 | Coronavirus Disease 2019 |
| M | Mean |
| MI | Moral injury |
| MIES-HP | Moral Injury Events Scale–Health Professional |
| MISS-HP | Moral Injury Symptoms Scale–Health Professional |
| PMIEs | Potentially morally injurious events |
| SD | Standard deviation |
| SPSS | IBM Statistical Package for Social Science |
| VIF | Variance inflation factor |

## Supplementary Information

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Supplementary Material 1.

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### Authors' contributions

RS and YW designed the study. RS and YW managed and analyzed the data. RS prepared the first draft. RS and YW reviewed and edited the manuscript, with comments from Roger Worthington. All authors were involved in revising the paper, and RS had full access to the data and gave final approval of the submitted versions. All authors have read and agreed to the published version of the manuscript.

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### Data availability

Data in request to Shao RQ at qing093011@163.com. This paper does not include any information about patients, and the data reported in this paper has not been included in any other reports.

## Declarations

### Ethics approval and consent to participate

Approved in decision HMUIRB2023036 by the institutional review board of Harbin Medical University. Informed consent was obtained from all subjects involved in the study.

### Consent for publication

Manuscript does not contain any individual data.

### Competing interests

The authors declare no competing interests.

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