Prevalence and Predictors of Moral Injury in Chinese Physicians

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Abstract

Background: The COVID-19 pandemic exacerbated moral distress in clinical practice, where physicians faced higher job demands in the face of strained healthcare resources, which had serious implications for their mental health and well-being. Moral injury (MI) - the betrayal of one's moral and professional values - is a negative factor affecting physicians' well-being, however, few studies have examined moral injury and its predictors in healthcare professionals. Therefore, this study aimed to determine the prevalence and predictors of MI 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 421 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, the Moral Injury Events Scale (MIES) was used to measure exposure to potentially morally injurious events (PMIEs), and the Medical Professionalism Scale (MPS) was used to assess the level of professionalism of physicians.

Results: The results of the study showed a mean score of 42.07 (SD±13.67) for the ten-item MISS-HP and 26.07 (SD±8.49) for the nine-item MIES, while 26.6% (N=112) suffered from clinically significant distress and impaired functioning. MIES scores, MPS scores, job satisfaction, witnessing patient suffering or death, lack of organizational

support, and frequent overtime work were significantly associated with MI symptom scores (MISS-HP).

Conclusions: Physicians reported commonly experiencing some PMIEs and suffering from MI-related symptoms in their clinical practice. Exposure to PMIEs, professionalism, job satisfaction, having witnessed a patient suffer or die, organizational support, and frequent overtime work can all be viewed as predictors of MI. After a physician experiences PMIEs, individual physicians, hospital administrators, and policymakers should take active steps to protect their mental health and minimize the negative impact of these adverse events on individual physicians.

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Background

The emergence of COVID-19 had an unprecedented impact on the mental health of global citizens[1], and healthcare professionals, as frontline workers in the fight against the outbreak, faced significant challenges to their physical and mental well-being[2][3]. Physician burnout and distress have been a concern not only in times of crisis, but also before pandemics[4][5]. Ethical decision-making dilemmas need to be faced in the careers of many physicians when they have to make accurate, prompt clinical decisions in complex situations[6]. The COVID-19 pandemic exacerbated moral distress in clinical practice, and healthcare workers faced higher job demands in the face of strained healthcare resources[7]. While healthcare professionals are not only needed to take on the physical and psychological stresses of the workplace and give care and attention to patients, they are also expected to maintain high levels of professionalism and empathy, and the physical and psychological needs and individual vulnerabilities of physicians are often overlooked[7][8].

Moral injury (MI), as an emerging concept, has received increasing attention from scholars in recent years. The concept of Moral Injury originated in a military context and can be traced back to the concept of Survivor's Guilt, as used to describe symptoms of guilt in survivors of the Holocaust[9]. Shay described the negative impact of war on the moral dimension of individuals and introduced the concept of MI: “the betrayal of justice by a person of legitimate authority in a high-stakes situation”[10]. In a medical context, especially for healthcare workers during the COVID-19 pandemic, it could be viewed as presenting a high-risk situation. Potentially morally injurious events (PMIEs) that occur in high-stakes situations, such as committing “morally wrong” actions and inactions or witnessing others’ acts of omission and commission may violate one’s long-standing and deeply ingrained moral values, behaviors, and expectations[11]. Experiencing PMIEs may cause

individuals to experience deep emotional wounds[12], negative moral emotions such as guilt and shame, and a loss of interpersonal trust, and MI-induced changes in beliefs about the world and the self may be deeper and more globalized[13].

Physician professional obligations are used to describe an individual's professional commitment to patients, colleagues, and society, but it is easy to overlook the accountability physicians have for themselves, including self-care, awareness of the alignment of self and institutional values, and so on[14]. The concept of MI has led some scholars to pay more attention to the "vulnerability" of healthcare workers[15]. The twenty-eighth item in the latest edition of the*International Code of Medical Ethics* refers to ‘the importance of safeguarding the physical and mental health and well-being of healthcare workers and encouraging them to seek professional help, if necessary, to ensure that they can practice safely’[16]. Reframing physician well-being as a core value facilitates the healthcare system's response to new societal challenges and guides decision-making at critical moments[8].

PMIEs significantly and negatively impact the mental health and well-being of healthcare workers[17][18]. Although there has been a gradual increase in the number of empirical studies of MI in medical personnel in recent years, most of them focus on the symptoms and consequences of MI[19], and few studies specifically explore the influencing factors of MI on healthcare professionals. Recent evidence suggests that moral injury can result in consequences at personal, interpersonal, and systemic levels[20], and MI is significantly associated with clinical symptoms such as depression, anxiety, burnout, compassion fatigue, suicidal ideation, substance use, sleep disturbance, and posttraumatic stress disorder[17][19][21][22][23]. Previous studies have shown that gender, age, department, years of practice, religious affiliation, psychiatric history, job satisfaction, organizational support, self-criticism, moral resilience, and existing symptoms of burnout can be regarded as influencing factors of MI[17][24][25][26][27][28][29].

The lack of scientific and objective measurement tools is an important reason for the slow progress of empirical research. In existing empirical studies, the operationalized definition of MI is vague and lacks a gold standard for assessing or diagnosing MI[30]. The Moral Injury Symptoms Scale–Health Professional (MISS-HP), developed by Mantri et al., is the most widely used scale to assess and diagnose MI in healthcare workers[31] and has been applied by scholars in different countries[22][28][32][33][34][35][36].

In the theoretical model described by Litz, individuals' moral judgments are moderated by culture and individual differences[30]. It is evident that the occurrence and development of MI are closely related to sociocultural factors. However, most existing empirical studies have been conducted in Western countries, and research needs to be expanded to explore the applicability of the concept of MI in different cultural contexts. For instance, few empirical studies have been conducted in China. Wang et al. conducted a survey of MI among more than 3,000 healthcare workers in mainland China during the pandemic, and this showed an MI prevalence of 41.3%[21]. China has a very large base of healthcare workers, and MI prevalence and influencing factors need to be explored further. Some scholars hypothesize that there is a link between physicians' professionalism and MI[6][12], but there is a lack of empirical evidence to verify this hypothesis. Therefore, to help fill gaps in this area of research, the present study aims to explore the prevalence of MI and associated factors among Chinese physicians, with the expectation of sparking a dialog that will drive future research on MI in the

medical workforce. Based on the main predictors of MI, rationalized recommendations for the prevention of MI in medical personnel are proposed to provide an objective basis for safeguarding the physical and mental health and well-being of medical personnel worldwide, with the aim of improving the quality of medical care and stabilizing the medical workforce.

Methods

Study design and participants

This study was conducted with the consent of the Ethics Committee of Harbin Medical University Health System Hospital. Between September 14 and October 27, 2023, a convenience sample of physicians from mainland China was surveyed using the snowball sampling method. The samples were mainly from the northeastern region of mainland China, with a major concentration in Heilongjiang Province. 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.

A link to the online questionnaire was provided to potential participants through a popular Chinese 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. There were 549 physicians who signed the informed consent form and completed the questionnaire. Of those, 128 invalid questionnaires were excluded during the data cleaning process, leaving a final sample of 421 physicians who were included in the analysis. The sample efficiency rate was 76.68%.

Measures

Outcome measure

The severity of MI symptoms was the primary outcome, which was measured using the ten-item Moral Injury Symptom Scale-Health Professional (MISS-HP) developed and validated by Mantri et al. among USA healthcare professionals[31]. This scale was translated into Chinese by Wang et al. and applied to Chinese medical personnel[36]. Response options for each of the 10 items range from 1 to 10 to signify agreement or disagreement with each statement, with a total score ranging from 10 to 100. Higher scores indicate a greater number and severity of MI symptoms, and item 10 was used to assess the loss of religious or spiritual beliefs. Since only a small percentage of the population has religious beliefs in mainland China[37], we expected to assess the impact of moral injury on physicians' professional beliefs, and item 10 ‘religious/spiritual faith’ was changed to ‘professional beliefs/spiritual faith’. Reliability or the internal consistency of the scale among the physicians was acceptable (Cronbach’s α =0.73). Moderate to severe distress associated with MI and impaired functioning at work, in relationships, and in other areas of life indicate clinical significance and are assessed on a

five-point Likert scale[31]: not at all, mild, moderate, very much, and extremely. “Moderate,” “Very Much” and “Extremely” indicate clinically significant distress and impairment in functioning.

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 (Yes/No), length of practice(categorized as ≤5, 6-15, 16-25 and ≥26), 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 (Yes/No), frequent overtime work (Yes/No), feeling overworked (Yes/No), and receiving any support from family or friends (Yes/No).

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

The questionnaire lists several PMIEs in clinical work. Workplace violence was assessed by asking: “Have you ever been attacked by your patients or their close relatives, either physically or verbally?” Medical error or dispute was assessed by asking: “Have you experienced medical errors or medical disputes?” Witnessing patient suffering or death was assessed by asking: “Have you ever witnessed a patient suffer or die?” The pressure of media public opinion was assessed by asking: “Do you feel that public opinion is pressurized and leads to tensions between doctors and patients?” Response categories were yes or no.

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

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

Exposure to PMIEs was measured with the Moral Injury Events Scale (MIES), which was developed by Nash et al. and applied in a military context[39]. MIES consists of three factors: transgressions by others, transgressions by self, and betrayal[40]. Responses are measured on a 6-point Likert scale of 1 (strongly agree) to 6 (strongly disagree). Total scores range from 9 to 54. Higher scores indicate greater exposure to and/or impact of morally injurious events. In keeping with existing adaptations of the MIES, item wordings were amended to reflect the healthcare population. 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). In this study, the Cronbach’s alpha for the scale was 0.82.

To measure medical professionalism, we used the 14-item Medical Professionalism Scale (MPS), which was developed

by experts in medicine and bioethics through a literature review, with items derived from the Physician's Charter of Medical Professionalism and the American Medical Association Code of Ethics. The scale consists of 14 items that ask physicians to report the frequency of various professional behaviors within the last year. The scale consists of five factors: the primacy of patient welfare, integrity and accountability, altruism, social justice, and professional competence. The response scale for the professional behavior items was 1=never to 5=very frequently. The total score ranged from 14 to 70. The greater the frequency of self-reported professional behaviors by the respondent, indicating a higher level of professionalism, the higher the scale score. In this study, the Cronbach's alpha for the scale was 0.95.

Statistical analysis

All data were entered and analyzed using the IBM Statistical Package for the Social Sciences version 26 (IBM SPSS 26). We conducted descriptive analyses of the participants based on their demographics, work-related information, and PMIEs. Sample characteristics were summarized by calculating frequency distributions (%) for categorical variables and determining means (and standard deviations) for continuous variables along with response ranges. Histograms, normal curves, Q–Q plots and P-P plots were analyzed to test the normality of the distribution of continuous variables. Independent t-tests and ANOVA evaluated the mean differences in the MISS-HP score by participants' characteristics. The prevalence of MI among physicians was calculated.

MISS-HP scores were used as the dependent variable, demographic variables, work-related factors, etc., were used as independent variables. To explore the effect of the independent variables on MI symptoms, we performed multiple linear regression analysis using stepwise selection of predictor variables and multicollinearity was checked using variance inflation factor (VIF). Potential correlates at $p < 0.05$ in the bivariate analysis were included in the multiple linear regression model. The trend level was set at $0.05 < \alpha < 0.10$. We also examined the residuals of the regression analyses for the outcome variables (MISS-HP scores) to test for the assumptions of linearity, homoscedasticity, independence, and normality. All regression analyses were consistent with assumptions regarding variable distribution and there was no evidence for collinearity (VIF values ranged from 1.06 to 1.22).

Results

Descriptive statistics

The mean score of the MISS-HP was 42.1 among the participants, and 26.6% (N = 112) of respondents had MI-related clinically significant distress and impaired functioning. As shown in Table 1, a total of 421 physicians completed the survey. The majority were female (57.0%), aged 26-35 years (29.5%), married (57.7%), undergraduate (45.6%), and did not meet expected income (84.1%). A total of 33.7% of physicians self-reported a need for professional counseling to relieve psychological stress. The majority of the respondents had a job title of intermediate or below (74.8%). Most of the respondents were those with ≤5 years of practice (45.4%), internal medicine department (45.8%), and did not hold

managerial positions (86.9%).

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

Characteristics	n	%	MISS-HP score		P
			Mean	SD	
Total	421	100	42.07	13.67	
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	0.200
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	0.706
Married	243	57.7	42.28	14.03	
Educational attainment					
Technical secondary school	41	9.7	44.20	12.21	0.536
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	**0.013**
Yes	67	15.9	38.27	16.13	
Length of practice					
≤5	191	45.4	40.85	12.90	0.392
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	
Job title					
Internship and training	144	34.2	40.92	12.69	0.411
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	0.066
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	

Pediatrics	21	5.0	43.71	16.37	
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	0.409
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	
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	**0.028**
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	

Bivariate Analyses

In bivariate analyses, male sex, not meeting income expectations, lack of organizational support, frequent overtime, feeling overloaded with work, lack of social support from family and friends, and lower job satisfaction were significantly associated with MI symptoms (all *p* values < 0.05; Table 1). MISS-HP scores were significantly higher among physicians who had a need for professional help in relieving psychological stress, had experienced workplace violence, medical errors or medical disputes, witnessed the suffering or death of patients, and felt pressured by public opinion and tensions in the doctor-patient relationship (all p values < 0.05; Table 1).

Regression analyses

A multiple linear regression model was computed to investigate predictor variables that had a significant influence on the MISS-HP. Sociodemographic and work-related characteristics of the participants who were deemed to be associated with MI symptoms (Table 1) ($p < 0.05$)were included in the multiple linear stepwise regression models. In addition, the MIES and MPS scores were included as independent variables in the multiple linear regression model predicting MI (Table 2).

In the final regression model, MIES scores, MPS scores, job satisfaction, witnessing patient suffering or death, lack of organizational support, and frequent overtime work were significantly associated with MI symptom scores (MISS-HP).

Each point increase in the MIES score increased the MISS-HP score by 0.76 points ($p < 0.01$), and conversely, each point increase in the MPS score decreased the MISS-HP score by 0.33 points ($p < 0.01$). Physicians rated subjectively perceived job satisfaction between 1 (dissatisfied) and 3 (extremely satisfied). There was a 3.4-point decrease in the MISS-HP for each positive step on the job satisfaction scale ($p < 0.01$). Witnessing patient suffering or death increased the MISS-HP score by 3.39 points ($p = 0.012$). Lack of organizational support (delta 2.97 points, $p = 0.013$) or frequent overtime work (delta 2.59 points, $p = 0.016$) also resulted in more severe MI symptoms. Details of the multiple linear regression model can be found in Table 2. On the other hand, the other independent variables included in the model did not achieve statistical significance in the stepwise integration of the predictor variables, so these variables had to be removed from the linear regression model due to their low significance.

Table 2. 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	41.065	4.261		0.000	32.689	49.442
MIES score	0.762	0.062	0.473	0.000	0.640	0.885
MPS score	-0.332	0.053	-0.229	0.000	-0.436	-0.229
Job satisfaction	-3.398	0.971	-0.136	0.001	-5.307	-1.49
Witnessing patient suffering or death	3.386	1.336	0.093	0.012	0.760	6.012
Lack of organizational support	2.969	1.187	0.095	0.013	0.635	5.303
Frequent overtime work	2.594	1.071	0.092	0.016	0.489	4.699

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. ($F= 64.962$; $p < 0.01$; R=69.6%; R^2=48.5%; adjusted $R^2 = 47.7\%$)

Discussion

The present study assessed the prevalence and predictors of moral injury among Chinese physicians. The results of the study showed a mean score of 42.07 (SD±13.67) for the ten-item MISS-HP and 26.07 (SD±8.49) for the nine-item MIES. Comparing the theoretical median values of the two scales (50 and 27) indicates that the moral injury of Chinese physicians is at a moderate level and that physicians who commonly experience PMIEs in their clinical practice, exhibit symptoms accordingly. The mean MISS-HP score for this sample was higher than that previously reported for samples from the United States (36.8)[24], Pakistan (37.7)[26], Europe (32.31)[34], Honduras (34.80)[32], and Iran (35.76)[41], but lower than that reported during the first wave of the pandemic in China(46.9)[36]. In China, a MISS-HP cutoff score of 50 or higher is considered for respondents who had MI-related to indicate clinically significant distress and impaired functioning[21], therefore, the prevalence of MI among the physicians in this study was 31.6%. However, differences in sample sources may lead to variability in cutoff scores[21][22][31][34][35]. There is no clear gold standard for the diagnosis of MI, so the cutoff should be treated with caution.

Bivariate and regression analyses showed that MI among Chinese physicians is influenced by a variety of factors. To identify the factors that affect MI symptoms among physicians, this study performed analyses at the personal, organizational, and healthcare system levels.

Individual factors

In the regression analysis, we found that MIES scores were predictors of MI symptoms. As expected, the greater the exposure to PMIEs, the more severe the physicians' MI symptoms. Due to the special characteristics of the medical profession, physicians need to face moral distress that may arise at any time in their clinical work, such as how to distribute limited medical resources fairly and equitably, and how to balance their busy work and their own private lives. Moral distress is inevitable in medical work[42], and because physicians often need to make prompt and accurate clinical decisions in high-risk situations, each decision is challenging, and the COVID-19 pandemic has amplified these issues.

Physicians' individual experiences are closely related to MI, and these experiences may involve behaviors that violate individual healthcare professionals' values and codes of ethics or cause harm to patients and others. It has been shown that healthcare resource constraints, witnessing patient suffering or death, institutional betrayal, being treated unfairly, medical errors, excessive workloads, and administrative stress can all be viewed as PMIEs[7][43][44]. The results of the present study show that experiencing workplace violence, and medical errors, and physicians who witness patient suffering or death had higher levels of MI symptoms, which is consistent with previous findings[7][21][24][45]. Symptoms of

MI are associated with lower levels of resilience and social support[27][29][46], and more severe MI symptoms can have a negative impact on the mental health of physicians[23]. The results of this study showed that 33.7% of physicians have mental health needs, which means that this population may have greater psychological distress and a desire to seek professional help to relieve psychological stress. In addition, physicians with mental health needs had significantly more severe MI symptoms, which is consistent with previous findings that MI is associated with poor mental health symptoms and negatively impacts physician well-being[17][18]. Therefore, physicians should increase their learning of self-care strategies and be proactive in seeking help from their organizations[47].

In addition, the results of the present study showed that MI is related to gender, with men having more severe symptoms of MI than women, however, our findings do not support previous studies. The factors that contribute to the differences in gender and MI symptoms may be influenced by many factors, including the sociocultural environment[30]. Previous studies have shown that women have higher levels of MI[21][26], and the difference in MI by gender needs to be verified by more empirical studies in the future.

Furthermore, to the best of our knowledge, this is the first quantitative study on the correlation between MI and medical professionalism in mainland China. Our study showed that medical professionalism was a predictor of MI and that lower professionalism predicted higher levels of MI symptoms, implying that medical professionalism may be a protective factor for MI. Medical professionalism encompasses professional values such as the primacy of patient welfare, professional competence, justice, and empathy[48]. Studies have shown that professionalism improves patient safety, individual physician well-being, healthcare organization reputation, and health system productivity[49][50][51]. MI may occur when physicians are forced to make ethical compromises due to an externally constrained system and may engage in unprofessional behaviors that conflict with their principles, such as "the primacy of patient welfare," and violate their moral codes and professional values. It has been shown that unprofessional behaviors, insensitive patient care practices, decreased empathy and altruism, and dishonest behaviors are associated with burnout[51][52][53][54]. Higher medical professionalism motivates physicians to uphold their ethical commitments and behave in accordance with their professional values in the face of moral distress to help individuals resist the onset of MI. Similar findings have been found in empirical studies of nurses, which suggest that moral resilience and moral courage are protective factors against MI[55].

Organizational and healthcare system-level factors

Our study also found that lack of organizational support, frequent overtime, and lower job satisfaction significantly predicted higher levels of MI symptoms. This is consistent with previous findings that MI symptoms are associated with organizational support, workload, and job satisfaction[15][24][56]. The well-being of healthcare workers is strongly associated with the level of organizational support, both during and before the pandemic[5][43]. The emergence of COVID-19 has made it more common for physicians to face excessive workloads and frequent overtime. Healthcare professionals are vulnerable in the face of high-risk work and are particularly susceptible to MI at this special time. Shortages of healthcare resources, urgent medical work, and a perfectionist healthcare culture can mean that superiors and hospital

administrators are relatively oblivious to the physical and mental well-being of their staff, and oblivious to their needs as human beings[56][57]. The results of this study showed that 63.4% of physicians reported frequent overtime and 65.1% felt overloaded, indicating that physicians generally face heavy workloads. PMIEs in medical work include transgressions by superiors or organizations that betray personal moral/ethical beliefs or expectations, superiors who do not take responsibility for events and generally do not support their employees, and institutional betrayal[7][44]. Previous studies have shown that MI is likely to occur when the relationship between physicians and the healthcare system breaks down, when physicians no longer trust the healthcare organization. A supportive workplace environment is related to lower moral injury[27][38].

Lower organizational support leads to lower job satisfaction, which in turn negatively impacts physician motivation[5]. It is now widely recognized by scholars that the occurrence of moral distress and MI is rooted in larger, systemic healthcare system issues and that we should not focus only on individual physicians, but on the broken healthcare system[5][7]. Healthcare organizations and systems should promote systemic change and actively create a good work environment or culture for healthcare workers[7][8]. As mentioned in the latest edition of*the International Code of Medical Ethics*[16], to ensure that they are able to practice safely, physicians should actively seek help from their superiors and healthcare organizations, in addition to raising awareness of self-care. Hospital administrators and healthcare systems should pay more attention to the physical and mental well-being of their staff and propose policy recommendations to guide healthcare leaders and health systems in this endeavor[45]. Healthcare organizations should provide professional support for healthcare workers, such as setting up a special counseling department within the organization or teaching healthcare workers self-care strategies to safeguard their mental health[14][58]. There is an urgent need for a special role for the "doctor's doctor" to help healthcare professionals better cope with the high-risk, high-stress events they may encounter in the course of their work.

We also found that as many as 90% (N=379) of the respondents perceived that the doctor–patient relationship is strained. 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 well-being[3][59]. Therefore, the media should be encouraged to guide positive social opinion and promote the harmonious development of doctor-patient relationships, especially in times of crisis, and it is important to enhance the trust between doctors and patients, which is of great significance to the prevention of MI.

Limitations

Several aspects of the present study limit the generalizability and interpretation of the findings. First, the convenience sample of physicians here came from one academic center in the northeast region of mainland China, thus requiring caution when generalizing to physicians in other healthcare systems, and the variability of different cultural and social factors needs to be taken into account. Second, in this study, the translated and adapted MIES-HP and the self-developed medical professionalism scale were used. The reliability and validity of the two scales need to be further generalized and validated. Third, the cross-sectional nature of these findings prevents causal inferences from being made, in that

prospective studies will be needed to determine whether MI symptoms cause lower medical professionalism, job satisfaction, or higher psychological stress, or vice versa, or whether the effects are bidirectional in nature. Fourth, due to limited space, this study did not specifically list the scores and correlations for each item of each scale, and more detailed analyses will be presented through other articles.

Conclusions

In conclusion, this study examined the prevalence and predictors of MI among Chinese physicians. The results of the study showed that the mean value of the MISS-HP was 42.07, and physicians reported commonly experiencing some PMIEs and suffering from MI-related symptoms in their clinical practice. Physicians' MI symptoms were associated with exposure to PMIEs, medical professionalism, witnessing patient suffering or death, job satisfaction, lack of organizational support, and frequent overtime. Our aim is not to exempt physicians from the risk of experiencing PMIEs in their clinical practice, but rather to focus on protecting the health of physicians after they experience PMIEs through a series of measures to minimize the negative impact of these adverse events on the individual physician and to spark a dialog that motivates future research. As physicians have always taken on the role of caregivers, their physical and mental health and well-being have sometimes been overlooked. Modern professionalism must have self-care and self-awareness as one foundation[60]. It is time to protect and care for healthcare professionals, and researchers, hospital administrators, and policymakers around the world should work together to improve the well-being and mental health of physicians.

Abbreviations

- ANOVA: One-way analysis of variance
- CI: 95% Confidence Interval
- COVID-19: Coronavirus Disease 2019
- M: mean
- MI: Moral injury
- MIES: Moral Injury Events Scale
- MISS-HP: Moral Injury Symptoms Scale–Health Professional
- MPS: Medical Professionalism Scale
- PMIEs: Potentially Morally Injurious Events
- SD: Standard Deviation
- SPSS: IBM Statistical Package for Social Science
- VIF: Variance inflation factor

Statements and Declarations

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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 RW. 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.

Competing interests

The authors declare no conflict of interest.

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Availability of data and materials

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 included in any other reports.

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.

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