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The impact of moral injury on healthcare workers' career calling: exploring authentic self-expression, ethical leadership, and self-compassion

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Abstract

Background Moral injury is a significant issue for healthcare workers, often stemming from exposure to ethical dilemmas and distressing events. This study aims to explore the relationship between moral injury and healthcare workers' career calling, using the job demands-resources model as a theoretical framework. The goal is to understand how moral injury affects healthcare workers' sense of purpose and vocation and identify factors that may mitigate this impact.

Methods A cross-sectional survey was conducted with a sample of 506 Chinese healthcare workers. The study used self-report questionnaires to assess moral injury, authentic self-expression, self-compassion, ethical leadership, and career calling. Path analysis was used to test the proposed mediating and moderating relationships within the job demands-resources model.

Results Moral injury has a negative effect on healthcare workers' career calling. This effect is mediated by authentic self-expression – the inability to openly discuss moral distress weakens the sense of purpose. Self-compassion and ethical leadership buffer against the negative impact of moral injury on career calling.

Conclusions This research contributes to the understanding of moral injury and career calling in healthcare workers, with practical implications for safeguarding healthcare professionals' well-being and commitment to their vocation.

Keywords Healthcare workers, Career calling, Moral injury, Authentic self-expression, Self-compassion, Ethical leadership

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Introduction

In recent years, the global pandemic has posed significant challenges and pressures for healthcare institutions and professionals. Physicians and nurses maintain close contact with COVID-19 patients, racing against time to save lives despite the personal risk of infection. Their unwavering commitment to patient care and self-sacrifice in confronting the COVID-19 crisis exemplify a profound sense of career calling. Viewing one's profession as a calling entails a psychological orientation to specific work, rooted in a transcendent guiding force that is intimately connected to an individual's sense of meaning and life purpose, ultimately aimed at serving others or advancing the common good [1, 2]. Career calling serves as a vital psychological motivator that sustains healthcare workers' engagement and motivation, enabling them to persevere in the fight against COVID-19 [3].

However, discerning, developing, and sustaining this career calling necessitates individuals investing adequate resources [4]. The COVID-19 pandemic has introduced numerous job demands on healthcare workers that may deplete their capacity to cultivate and uphold their career calling. Moral injury represents a prominent job demand faced by healthcare professionals during this period [5]. Moral injury encompasses experiences of cognitive dissonance, adverse moral emotions (e.g., guilt and shame), and spiritual turmoil arising when individuals engage in actions or witness events that conflict with their deeply held moral principles or beliefs [6]. During the COVID-19 pandemic, physicians and nurses are compelled to make critical ethical decisions amidst overwhelming patient volumes coupled with limited resources; they often experience feelings of helplessness, shame, and guilt due to their inability to assist patients facing life-threatening situations, placing them at considerable risk for experiencing moral injury [7]. Moral injury, a demand associated with psychological conflict arising from the impact of individual moral beliefs, is likely to affect physicians and nurses' experience of life meaning and ability to follow high moral standards in professions, which are the core elements of career calling. Therefore, this study focuses on the potential impact of moral injury on healthcare workers' career calling.

A robust sense of career calling is often considered a key indicator of subjective career success and eudaimonic well-being [8]. According to job demands-resources (JD-R) theory, job demands hinder individuals' well-being by depleting their resources and energy, thereby triggering the health-impairment process [9, 10]. It suggests that mediators exist in the relationship between moral injury and career calling. Previous research has demonstrated that authentic self-awareness and self-expression constitutes a vital resource for nurturing career calling [2, 11]. However, individuals experiencing moral injury may face an identity crisis and condemn their existence and meaning [7, 12], which can hinder their ability to comprehend and express themselves authentically. Thus, considering the health-impairment process outlined in JD-R theory, this study aims to integrate authentic self-expression as a mediator to elucidate how losing this resource mediates the impact of moral injury on healthcare workers' sense of career calling.

Moreover, JD-R theory suggests that replenishing one's job and personal resources can alleviate the adverse effects of job demands on well-being outcomes [9, 13]. Researchers advocate examining individual and organizational factors (particularly leadership) that can lessen the consequences of moral injury for healthcare practitioners [14]. Given the spiritual harm inflicted by moral injury along with the spiritual thriving signified by career calling, this study focuses on resources that contribute to one's spiritual growth. Consequently, this research investigates whether sufficient job resources (e.g., ethical leadership) and personal resources (e.g., self-compassion) can counteract (i.e., negatively moderate) the health-impairment process initiated by moral injury.

Job demands-resources theory

JD-R theory has been widely used to explain how job characteristics (i.e., job demands and resources) affect employees' healthy functioning and well-being [13]. When a job's physical, psychological, social, or organizational aspects require intensive physical, psychological, or social effort and may lead to stress or strain, those job characteristics are classified as job demands [15]. Examples include excessive work pressure and job insecurity. Job resources are job characteristics that help employees achieve work goals, stimulate personal growth, and cope with job demands, such as autonomy and social support [9].

The JD-R theory posits a health-impairment process related to job demands (see Fig. 1). Excessive job demands exhaust employees' energetic resources, resulting in negative consequences such as diminished well-being and burnout [10]. As prior research documented [16], career calling as one type of well-being, would be diminished by job demand (e.g., climate of caxu) through depleting the energetic resources (e.g., psychological empowerment). However, an abundance of resources can protect against the detrimental effects of job demands on health. Specifically, when adequate job resources are provided, employees with high job demands do not exhaust their energetic resources, thus preserving their overall well-being [9]. The expanded JD-R theory also incorporates personal resources, such as essential skills, and individual traits, such as self-efficacy and optimism [17]. These personal resources function similarly to job resources, acting as a buffer against the negative consequences of job demands

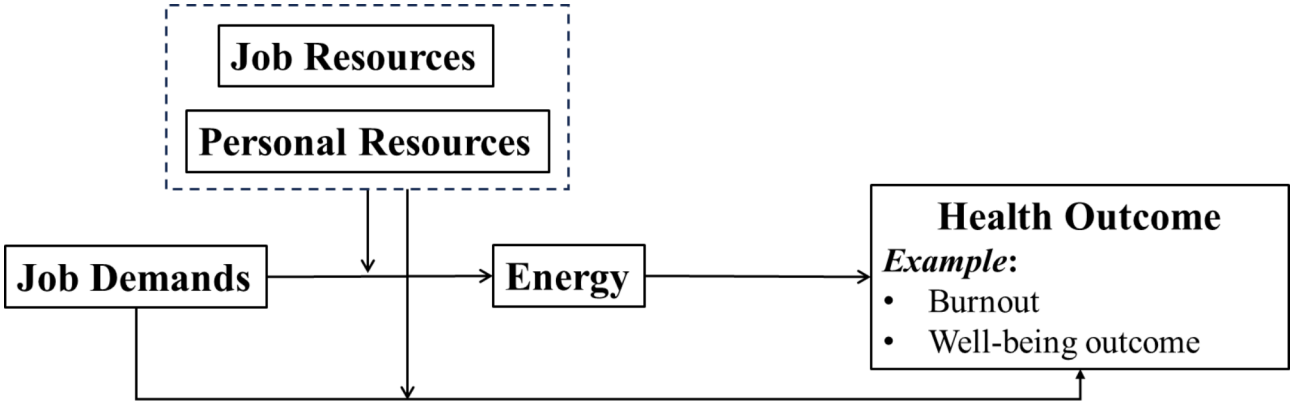

Fig. 1 The health impairment process of job demands-resources model

on employees' energy, health, and well-being outcomes [9, 13].

The effect of moral injury and career calling

Moral injury arises from potentially morally injurious events (PMIEs) consisting of external factors such as high-stakes scenarios and internal factors related to personal, internalized professional values and beliefs [12]. In high-stakes situations, healthcare professionals may find themselves operating under constraints beyond their control, such as institutional policies, resource limitations, or systemic failures that impede their ability to provide optimal care. For instance, during the COVID-19 pandemic, physicians and nurses might be compelled to prioritize one patient's needs over another's due to limited resources. Internal PMIEs include instances where individuals perceive they have perpetrated harm through their actions or inactions such as failing to intervene when witnessing unethical behavior, or when they observe violations of deeply held moral beliefs without being able to act against them. Such experiences of moral injury are often accompanied by internal moral conflict and create significant cognitive dissonance for healthcare workers who strive to uphold professional ethics. Moreover, there PMIEs cause deeper and long-lasting emotional and psychological wounds, including feelings of guilt or shame, a sense of powerlessness and helplessness, along with a diminished faith in the goodness of humanity.

At present, direct empirical evidence suggesting a close association between moral injury and career calling remains limited. Nevertheless, a longitudinal study conducted by Chesnut et al. [18] revealed that experiences of moral injury can lead to declines in well-being. Moreover, moral injury creates dissonance in moral values, obscures individuals' ideal selves, and leads to emotional numbing, which hinders the search and presence of meaning/purpose as well as prosocial behavior [12, 19]. Career calling is an important indicator of well-being, and its two core elements are meaning/purpose and prosocial intentions [1]. This indirect evidence implies a negative impact of moral injury on career calling.

Moreover, the JD-R theory provides theoretical support for the relationship between moral injury and career calling. Individuals discern and develop their career calling by aligning their skills, values, and interests with those of an occupation, during which they need to consistently allocate various resources (e.g., time and energy) [4, 20]. This suggests that the process of career calling can be viewed as a resource-intensive investment. Huang et al. [16] posited that when resources are scarce, individuals tend to employ defensive strategies, conserving current resources instead of using them for developing or maintaining their sense of career calling. Moral injuries sustained by healthcare workers can cause feelings of betrayal regarding moral values and standards, subsequently leading to emotional exhaustion and loss of self-identity [6]. This depletion of emotional and cognitive resources in response to morally injurious situations may prevent healthcare professionals from investing in cultivating and sustaining their career calling.

Consequently, we propose the following hypothesis:

Hypothesis 1 Moral injury adversely influences healthcare workers' sense of career calling.

The mediating effect of authentic self-expression

Authentic self-expression refers to individuals' behaviors being alignment with their values, preferences, and needs [21]. Individuals authentically express themselves based on clear self-awareness and unbiased processing [21]. Authentic individuals possess an awareness of their strengths, weaknesses, values, desires, and other self-related cognition. Furthermore, they develop their internal selves by engaging in non-biased processing of self-relevant information from diverse sources such as self-observation or feedback from others. As a fundamental means of satisfying basic psychological needs for

autonomy, relatedness, and competence [22], authentic expression can promote healthy psychological development, such as enhanced psychological well-being, increased positive emotions, and diminished negative emotions [22, 23]. Conversely, when individuals are compelled to express themselves inauthentically, they become susceptible to mental health issues such as anxiety and depression as well as burnout [22, 24]. This suggests that authentic self-expression serves as an energetic resource whose depletion can lead to adverse outcomes like diminished well-being and increased burnout.

The influence of authentic self-expression on career calling is supported by both theoretical and empirical evidence. From a theoretical perspective, Hall and Chandler posited that individuals initially develop their career calling through "knowing why" investments [11], which include exploring their true identities and comprehending their necessities. Furthermore, individuals with a propensity for authentic expression possess an awareness of their own interests, needs, and skills, and are motivated to engage in job crafting in alignment with their unique preferences and dispositions [25]. This engagement leads to an improved person-environment fit, an essential source of career calling [20]. This authentic self-expression plays a crucial role in identifying and nurturing one's sense of career calling. Empirically, Zhang et al. conducted a three-wave longitudinal study to examine the reciprocal dynamic relation between authenticity and calling [2]. Their findings indicated that higher levels of authentic living significantly predicted an increase in one's sense of career calling over time. Conversely, having a strong career calling did not lead to enhanced authentic living over time. Individuals who align with their true selves by living authentically are likely to develop a strong sense of calling. Consequently, healthcare professionals who express themselves authentically within the workplace are more likely to possess a robust sense of career calling.

Despite the limited research on the relationship between moral injury and authentic self-expression, there is indirect evidence that suggests moral injury negatively predicts authentic self-expression. As theorized by Litz and colleagues [6], moral injury encompasses experiences of cognitive dissonance and internal conflict that arise when the traumatic events contradict individuals' self-perception and worldview. These internal dissonances and conflicts can undermine self-integrity and foster a sense of mistrust towards the self [12], harming their self-awareness and self-concept clarity. However, clear self-knowledge and a well-defined self-concept are indispensable preconditions for authentic self-expression [26]. Furthermore, moral injury can generate feelings of guilt, self-contempt, and self-reproach. Experiencing intense guilt, regret, or treachery may produce erroneous beliefs such as "I am an evil person" and "I am undeserving of esteem" [6]. These detrimental effects of moral injury could cause individuals to doubt, restrain themselves, and be hesitant to convey their authentic opinions or convictions, inhibiting their authentic self-expression.

In conclusion, based on the health deterioration process of job demands, moral injury, as a form of job demand, depletes employees' resources and vitality (e.g., authentic self-expression), adversely affecting their well-being (e.g., career calling). Consequently, we propose the following hypothesis:

Hypothesis 2 Authentic self-expression acts as a mediator in the relationship between moral injury and healthcare workers' career calling.

The moderating effect of ethical leadership

Ethical leadership is characterized as the display of normatively suitable behavior through personal actions and interpersonal connections while endorsing such conduct to followers via bidirectional communication, reinforcement, and decision-making processes [27]. An ethical leader needs to be both a moral individual and a moral administrator [28]. Moral individuals exhibit a range of ethical qualities (e.g., honesty, care, uprightness, and fairness) in their behaviors, causing followers to perceive them as legitimate and reliable role models [29]. Being a moral manager entails establishing and promoting ethical principles as well as reward and punishment systems to encourage followers' ethical actions. Research identifies ethical leadership as a valuable job resource and has demonstrated that leaders' ethical behavior positively impacts followers' authentic self-expression and career calling [30, 31].

According to the job demands-resources (JD-R) theory, ethical leadership can serve as a protective factor in mitigating the negative effects of moral injury on healthcare professionals' authentic self-expression. A meta-analytic review indicated that the moral attributes and managerial approaches of ethical leaders foster an ethical work environment, promoting psychological safety, respect, ethical assurance, and support among healthcare workers [32]. Ethical leadership empowers employees to confront and overcome moral challenges and distress [31] while also providing the determination to make decisions [29]. Furthermore, ethical leaders can reshape followers' moral identities by encouraging the integration of their moral values into followers' self-conception [28]. Within the ethically driven, just, and secure atmosphere created by ethical leaders, healthcare professionals facing moral injury may find it resilient to resolve moral conflicts and adhere to their personal moral principles in their actions. The fundamental traits of integrity and honesty displayed by ethical leaders also serve as role models for healthcare

workers in embracing their authentic selves. Consequently, despite experiencing moral injury, healthcare professionals are more emboldened and inclined to demonstrate moral behaviors aligned with their true selves under ethical leadership.

Moreover, ethical leadership plays a vital role in safeguarding the career calling of healthcare workers against moral injury. Moral injury often causes healthcare professionals to struggle with the conflict between their moral values and the realities of their profession, leading them to lose trust in themselves and others and view the world as immoral. Litz et al. [6] suggested that fostering beliefs in a just world and providing forgiving support can minimize global causal attributions, encourage corrective action, and aid recovery from moral injury. By demonstrating moral traits and advocating moral principles, ethical leaders establish a positive ethical climate that empowers their followers with support, courage, and confidence to confront unethical conduct, cope with moral distress, and act in accordance with organizational ethical values [31]. This type of leadership helps healthcare workers maintain faith in a just and moral world (i.e., just world beliefs) while proactively seeking opportunities for renewal and redemption instead of succumbing to self-guilt or blaming themselves or others.

Furthermore, ethical leaders make principled, fair decisions and openly discuss moral ethics and reasoning with their followers. They serve as role models for ethically sound decision-making and promote prosocial behavior [29]. Even when faced with moral injury, healthcare workers who perceive ethical leadership are more likely to recover quickly from moral conflicts, adhere to their own moral principles for prosocial conduct, and effectively address other individuals' unethical actions. Therefore, ethical leadership acts as a protective force for healthcare workers experiencing moral injury by enabling them to express their prosocial intent, which is a fundamental aspect of career calling.

Hypothesis 3 Ethical leadership has a moderating effect on the relationship between moral injury and authentic self-expression among healthcare workers. As healthcare workers receive more ethical leadership from their supervisors, the negative impact of moral injury on authentic self-expression decreases.

Hypothesis 4 Ethical leadership also moderates the relationship between moral injury and career calling for healthcare workers. When healthcare workers experience greater ethical leadership from their supervisors, the adverse influence of moral injury on their career calling decreases.

The moderating effect of self-compassion

Self-compassion involves treating oneself with care, warmth, and nonjudgmental understanding during times of personal inadequacy or failure. As defined by Neff [33], self-compassion consists of three crucial components: (1) self-kindness, which entails offering oneself compassion and understanding instead of harsh criticism; (2) common humanity, which involves viewing one's experiences as part of a broader human context rather than feeling isolated; and (3) mindfulness, which requires maintaining a balanced awareness of one's negative thoughts and emotions instead of becoming overly engrossed in them. Practicing self-compassion enables individuals to be more mindful and nonjudgmental of their adverse experiences, recognize these experiences as common among humans, and exhibit understanding and forgiveness of themselves. Research suggests that self-compassion serves as a safeguard against escalating negative experiences (such as depression, anxiety, or feelings of meaninglessness) when facing unfavorable situations (such as ostracism or discrimination; [34, 35]).

Prior research has offered indirect support for the advantages of self-compassion in addressing moral injury and its harmful impacts. For instance, Litz et al. [6] suggested several intervention methods, such as self-forgiveness, to assist individuals in coping with moral injury. They argued that self-forgiveness can reduce one's desire for self-punishment and increase one's inclination to treat oneself kindly. In a similar vein, Pearce et al. [36] endorsed a spiritually integrated cognitive processing therapy that employed spiritual principles such as compassion and forgiveness to handle spiritual harm from moral injury. Furthermore, Kopacz et al. [37] recommended pastoral care and mindfulness as alternative treatments for moral injury management. Pastoral care, characterized by nonjudgmental listening and attention to personal needs, has been found to be helpful in re-establishing a sense of purpose, enhancing self-acceptance, and improving relationships with others [37]. In addition, recognizing that others share comparable negative experiences (i.e., common humanity) can prevent individuals from succumbing to feelings of self-disgust, self-blame, and self-critique [33].

Based on previous findings and JD-R theory, self-compassion may serve as an important personal resource for healthcare workers experiencing moral injury. Moral injury arises among healthcare workers who are unable to save patients from life-threatening situations and struggle with ethical decision-making due to limited resources and overwhelming patient numbers. High levels of self-compassion allow healthcare workers to acknowledge, without judgment, their limitations and forgive themselves for any shortcomings. This self-compassion relieves them from self-doubt and self-criticism

regarding their moral values, thus enabling them to act prosocially even amidst moral injury. Furthermore, self-compassion allows healthcare workers to realize that others share similar negative experiences, helping them feel less isolated. This sense of connection fosters a meaningful perception of their existence and encourages authentic self-expression. Consequently, self-compassion can mitigate the detrimental impacts of moral injury on healthcare workers' professional calling (i.e., prosocial intentions and finding meaning in their existence) and authentic self-expression. Therefore, we propose the following hypotheses:

Hypothesis 5 Self-compassion moderates the impact of moral injury on healthcare workers' authentic self-expression. Higher levels of self-compassion result in a weaker negative correlation between moral injury and authentic self-expression.

Hypothesis 6 Self-compassion moderates the effect of moral injury on healthcare workers' career calling. The more self-compassionate healthcare workers are, the less moral injury negatively affects their career calling.

Regarding the mediating role of authentic self-expression between moral injury and career calling (Hypothesis 2), this study further suggested that both ethical leadership and self-compassion can moderate this mediating effect. The proposed hypotheses are as follows:

Hypothesis 7 Ethical leadership moderates the mediating influence of healthcare workers' authentic self-expression between moral injury and career calling. The stronger the perceived ethical leadership is, the weaker the mediating effect of authentic self-expression.

Hypothesis 8 Self-compassion moderates the mediating influence of healthcare workers' authentic self-expression between moral injury and career calling. The stronger the self-compassion is, the weaker the mediating effect of authentic self-expression.

The conceptual model that guides this study is shown in Fig. 2.

Method

Sampling procedure and data collection

Utilizing purposive convenience sampling, we conducted a survey of healthcare workers from two large public hospitals in Jilin Province, located in northeastern China. This northeastern region in China, recognized as an old industrial base, is currently facing numerous challenges related to economic transformation, including the allocation of medical resources and the improvement of medical service quality. Jilin Province plays a significant role

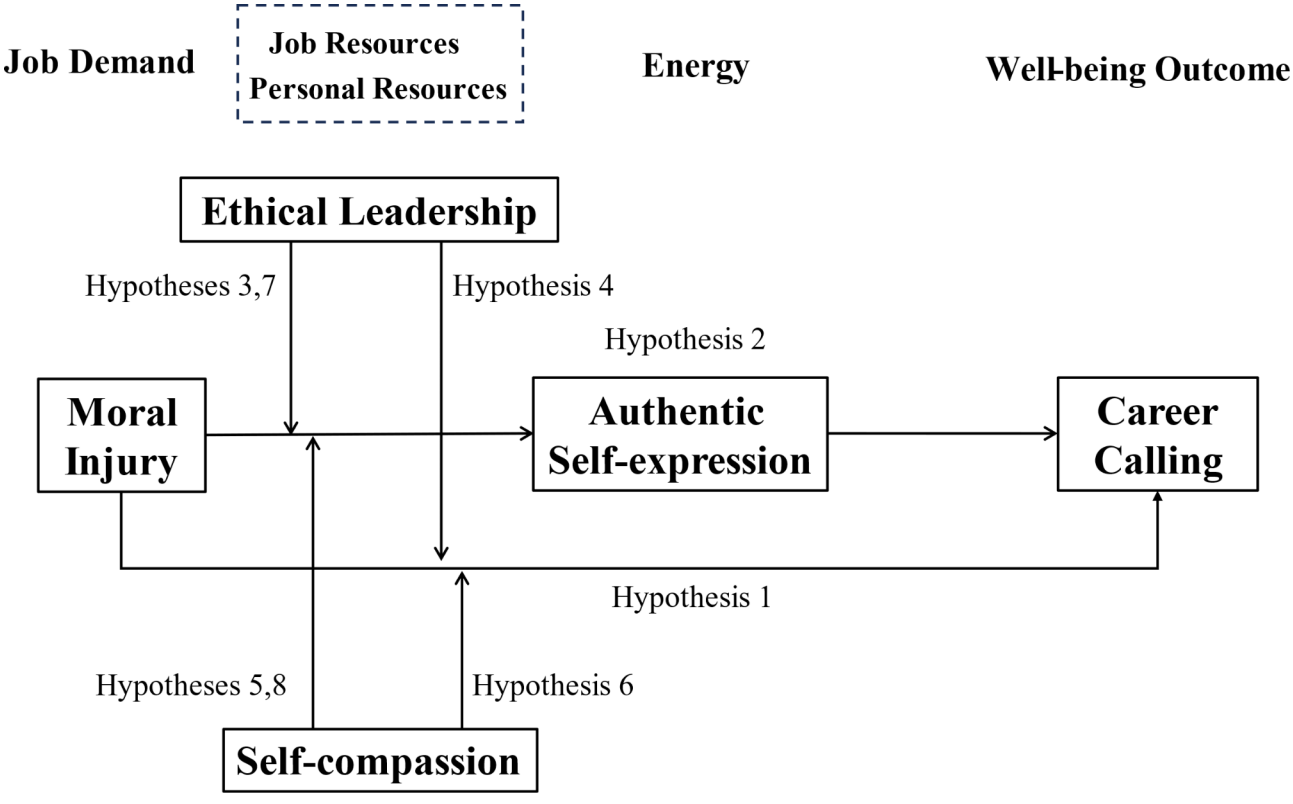

Fig. 2 Theoretical model from moral injury to career calling

in northeastern China and has been reported to have an uneven distribution of medical resources [38]. Furthermore, both selected hospitals are classified as grade-A tertiary institutions, which are more susceptible to medical disputes due to their higher patient volume and case complexity. Moral injury, often stemming from ethical conflicts and stressful work environments, can be exacerbated by these contextual factors in Jilin Province and can profoundly impact the mental health and well-being of healthcare professionals. Additionally, these hospitals possess a substantial workforce size that facilitates the collection of comprehensive and representative data.

The survey was conducted through an online questionnaire in December 2022. We employed various methods to invite healthcare workers from different departments and positions within the selected hospitals to participate in our study, including distributing flyers, hosting information sessions, and directly communicating with individual healthcare professionals. We ensured that all participants were fully informed about the study's purpose, procedures, and potential risks prior to obtaining their consent to participation. Additionally, we emphasized the importance of data anonymity and assured that all collected information would be used solely for academic purposes. After securing participants' agreement to engage, we delivered the online questionnaire through WeChat software. The study was approved by the Research Board at the School of Philosophy and Sociology at Jilin University, China.

Measures

All the questionnaires used in our study have previously been published and validated in previous studies.

Career calling was measured by the shortened presence subscale of the Calling and Vocation Questionnaire (CVQ-P) [1]. This shortened scale contains 9 items and covers three key dimensions of career calling: transcendent summons, purposeful work, and prosocial orientation. Items such as "I see my career as a path to purpose in life" were rated on a 4-point scale (1 = not at all true of me, 4 = absolutely true of me). In the current study, the Cronbach's alpha for the CVQ-P was 0.91.

Moral injury was measured by the 9-item Moral Injury Events Scale (MIES) [39]. This scale was rated on a 6-point answer format (1 = strongly disagree, 6 = strongly agree) and contained three dimensions: transgressions-others, transgressions-self, and betrayal. Examples include "I saw things that were morally wrong". In the current study, the Cronbach's alpha for the MIES was 0.92.

Authentic self-expression was measured by three items from Cable et al. [40] authentic self-expression scale. As documented by prior studies [41], the 3-item scale has good reliability and is associated with related criterion variables (e.g., work engagement and job satisfaction). Items such as "In this job, I feel authentic" were assessed on a 7-point scale (1 = strongly disagree, 7 = strongly agree). In the current study, the Cronbach's alpha for the 3-item scale was 0.91.

Self-compassion was assessed using the validated Self-Compassion Scale-Short Form (SCS-SF) [42]. This 12-item scale measures the positive and negative components of self-compassion. The positive component represents self-kindness, common humanity, and mindfulness, while the negative component includes overidentification, isolation, and self-judgment. Items (e.g., "When something upsets me, I try to keep my emotions in balance") were scored on a 5-point Likert scale (1 = almost never, 5 = almost always). In the current study, the Cronbach's alpha for the SCS-SF was 0.82.

Ethical leadership was assessed using a 10-item ethical leadership scale (ELS) [27]. This unidimensional scale was rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). A sample item is "My department leader conducts his/her personal life ethically." In the current study, the Cronbach's alpha for the ELS was 0.97.

Data analytical strategy

The present study conducted the following statistical analysis. First, preliminary analyses were conducted before testing our hypotheses. Specifically, the descriptive and correlational analysis of our participant characteristics and the five psychological variables was conducted by SPSS 26.0. Then, the confirmatory factor analysis (CFA) of the variables was performed by Mplus 8.3 to examine the common method bias and discriminant validity of the five variables. Second, we applied the Process 3.5 macro of SPSS 26.0 (Model 4 [43]), to test the effect of moral injury on healthcare workers' career calling and the mediating effect of authentic self-expression on this relationship. Third, we used the Process 3.5 macro of SPSS 26.0 (Model 10 [43]), to examine the moderating effects of ethical leadership (Hypotheses 3, 4, and 7) and self-compassion (Hypotheses 5, 6, and 8). When the moderation effects of ethical leadership and self-compassion are statistically significant, the Process macro can readily perform simple slope tests to compare the impact of moral injury on career calling or the mediating effect of authentic self-expression at different levels of the moderator (e.g., mean, mean + 1 SD, mean − 1 SD). The Process macro in SPSS is considered a common tool for examining the mediating and moderating effects [8, 43]. In our hypothesis tests, all the main variables were standardized before conducting the analyses.

Table 1 Sample characteristics ($N = 506$)

Characteristics		% (*n*)	M (SD)
Age			39.52 (11.29)
Job tenure			16.34 (11.85)
Gender (female)		80.8 (409)	
Education	Professional college degree or lower	15.6 (79)	
	Bachelor's degree	58.7 (297)	
	Master's degree or above	25.7 (130)	
Profession	Physician	37.5 (190)	
	Nurse	52.0 (263)	
	Other	10.5 (53)	

Table 2 Means, standard deviations, and correlations for the study variables ($N = 506$)

	M	SD	1	2	3	4	5
1.MI	2.87	1.17	-				
2.ASE	5.28	1.39	−0.30***	-			
3.CC	3.15	0.61	−0.26***	0.49***	-		
4.SC	3.27	0.42	−0.22***	0.23***	0.11*	-	
5.EL	3.81	0.86	−0.43***	0.42***	0.37***	0.12**	-
6.Age	39.52	11.29	0.26***	0.13**	0.02	−0.001	−0.27***
7.Tenure	16.34	11.85	0.26***	0.13**	0.03	0.01	−0.24***
8.Gender	-	-	−0.10*	0.02	−0.01	0.05	0.14**
9.Education	-	-	−0.07	−0.07	−0.06	0.002	−0.07
10.Profession	-	-	−0.02	−0.03	−0.02	−0.01	0.14**

Note: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. MI, moral injury; ASE, authentic self-expression; CC, career calling; SC, self-compassion; EL, ethical leadership. Gender: 0 = male, 1 = female. Education: 1 = professional college degree or less, 2 = bachelor's degree, 3 = master's degree or above. Profession: 1 = physician, 2 = nurse, 3 = other

Table 3 Confirmatory factor analysis

Model	χ^2	df	CFI	TLI	RMSEA	SRMR
1. Five-factor model (MI, ASE, CC, SC, EL)	2029.303	835	0.904	0.896	0.053	0.075
2. Four-factor model (MI + ASE, CC, SC, EL)	3269.249	849	0.806	0.793	0.075	0.103
3. Three-factor model (MI + ASE, CC, SC + EL)	3589.085	851	0.780	0.767	0.080	0.107
4. Two-factor model (MI + ASE, CC + SC + EL)	4551.862	855	0.703	0.686	0.092	0.145
5. One-factor model (MI + ASE + CC + SC + EL)	7571.712	860	0.461	0.434	0.124	0.163

Note: $N = 506$; MI, moral injury; ASE, authentic self-expression; CC, career calling; SC, self-compassion; EL, ethical leadership

Results

Preliminary analysis

A total of 585 healthcare workers completed our questionnaire. After eliminating 79 responses with an average response time per item of less than two seconds. 506 valid responses were finally retained. Sample characteristics of the valid sample are described in Table 1. Among our samples, 80.8% ($n = 409$) were female healthcare workers. The participants had an average age of 39.52 years ($SD = 11.29$) and an average job tenure of 16.34 years ($SD = 11.85$). In terms of educational background, 79 respondents (15.6%) held a professional college degree or lower, 297 (58.7%) had a bachelor's degree, and 130 (25.7%) possessed a master's degree or above. Regarding their professional roles, there were 190 physicians (37.5%), 263 nurses (52.0%), and 53 other healthcare professionals (10.5%).

The descriptive statistics and correlations for the study variables are displayed in Table 2. Moral injury was negatively associated with career calling, authentic self-expression, self-compassion, and ethical leadership ($p < 0.001$). Except for moral injury, there were significant and positive correlations among career calling, authentic self-expression, self-compassion, and ethical leadership ($p < 0.05$). Moreover, age and tenure were significantly associated with the mediator (i.e., authentic self-expression; $r = 0.13$, $p < 0.01$). Except for these relationships, all background variables (e.g., healthcare workers' gender, education, and profession) had nonsignificant relationships with the mediator and outcome variables (i.e., authentic self-expression and career calling). Considering the strong correlation between age and tenure ($r = 0.96$, $p < 0.001$), we included only age as a control variable in further hypothesis testing.

Confirmatory factor analyses were conducted to test common method bias and the construct distinctiveness of five variables. As shown in Table 3, when considering the five study variables as one factor, the

Table 4 Results of the path analysis in the mediation model ($N = 504$)

Predictors	Model 1: Career Calling		Model 2: Authentic Self-Expression		Model 3: Career Calling	
	β	95% CI	*β*	95% CI	*β*	95% CI
Age	0.10*	[0.01, 0.18]	0.22***	[0.13, 0.30]	−0.003	[−0.01, 0.01]
Moral Injury	−0.28***	[−0.37, −0.20]	−0.36***	[−0.44, −0.27]	−0.12**	[−0.21, −0.04]
Authentic Self-Expression					0.46***	[0.38, 0.54]
R^2	0.08***		0.13***		0.26***	
F	20.51		38.45		57.64	
Indirect effect	−0.16	[−0.22, −0.11]				

Note: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. Bootstrap sample size = 5000. Due to missing data on age, two participants were excluded through pairwise deletion

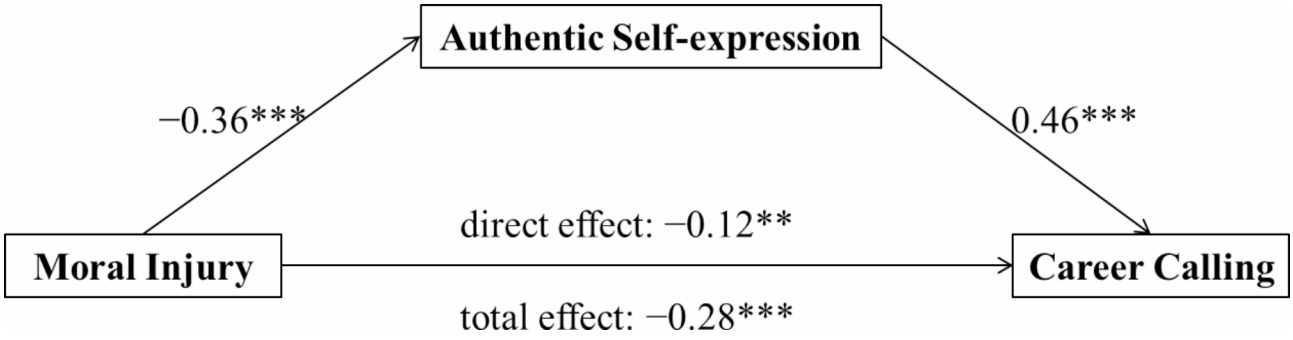

Fig. 3 Mediation effect of authentic self-expression between moral injury and career calling
Note: $N = 504$. **$p < 0.01$, ***$p < 0.001$. Bootstrap sample size = 5000. Numbers in the model are standardized path coefficients

one-factor model did not fit the data ($\chi 2 = 7571.712$, $df = 860$, CFI = 0.461 < 0.90, TLI = 0.434 < 0.90, RMSEA = 0.124 > 0.060, and SRMR = 0.163 > 0.080). Compared with the alternative models shown in Table 3, the one-factor model fit was the worst. This indicated that common method bias did not seriously threaten the present study. Considering the discriminant validity of the variables, the results showed that the five-factor model had the best fitness parameters ($\chi 2 = 2029.303$, $df = 835$, CFI = 0.904, TLI = 0.896, RMSEA = 0.053, and SRMR = 0.075) and fit the data better than the other competing models. This finding supported the inclusion of these five variables as separate constructs in our further analysis.

The effect of moral injury on career calling

Hypothesis 1 proposed that moral injury has a negative effect on career calling. The results of the path analysis examining the relationship between moral injury and career calling are presented in Table 4. The results of Model 1 showed that moral injury negatively predicted healthcare workers' career calling (β = −0.28, 95% CI = [−0.37, −0.20]). Moreover, as illustrated in Model 3 of Table 4, when the mediator (i.e., authentic self-expression) was included, the direct effect of moral injury on career calling was also significant (β = −0.12, $p < 0.01$). Hypothesis 1 was supported.

The mediating effect of authentic self-expression

Hypothesis 2 proposed the mediating mechanism of authentic self-expression. Table 4; Fig. 3 represent the results of the mediation analysis. As shown in Table 4; Fig. 3, moral injury negatively predicted healthcare workers' authentic self-expression (β = −0.36, $p < 0.001$), while authentic self-expression positively predicted career calling ($\beta = 0.46$, $p < 0.001$). Moreover, the results in Table 4 indicate a significant indirect effect of moral injury on career calling via authentic self-expression (β = −0.16, 95% CI = [−0.22, −0.11]). The mediation effect accounted for 57.14% of the total effect. This supported Hypothesis 2.

The moderating effect of ethical leadership

Hypotheses 3 and 4 assumed that ethical leadership moderates the direct effect of moral injury on authentic self-expression and career calling. Hypothesis 7 proposed that ethical leadership moderates the indirect effect of authentic self-expression on the relationship between moral injury and career calling. Table 5; Fig. 4 present the results of the moderated mediation model, and Table 6 illustrates the conditional effects at different levels of the two moderators.

As seen in Fig. 4 and Model 4 of Table 5, ethical leadership significantly moderates the relation between moral injury and authentic self-expression ($\beta = 0.13$, $p < 0.001$). The effect of moral injury on authentic self-expression varies significantly between the high-level and low-level ethical leadership. As shown in Table 6, the results from the simple slope tests reveal that when perceived ethical

Table 5 Results of conditional process analysis ($N = 504$)

Predictors	Model 4: Authentic Self-Expression		Model 5: Career Calling	
	β	95% CI	*β*	95% CI
Age	0.27***	[0.19, 0.35]	0.04	[−0.04, 0.13]
Moral Injury	−0.19***	[−0.27, −0.10]	−0.08	[−0.16, 0.01]
Authentic Self-Expression			0.41***	[0.32, 0.50]
Self-Compassion	0.16***	[0.09, 0.24]	−0.03	[−0.11, 0.05]
Ethical Leadership	0.35***	[0.27, 0.44]	0.21***	[0.12, 0.30]
Self-Compassion × Moral Injury	−0.02	[−0.09, 0.05]	0.09**	[0.02, 0.16]
Ethical Leadership × Moral Injury	0.13***	[0.06, 0.20]	−0.06	[−0.13, 0.01]
R^2	0.31***		0.30***	
F	36.40		29.67	
Indices of moderated mediation				
Self-Compassion as moderator	−0.01		[−0.04, 0.02]	
Ethical Leadership as moderator	0.05		[0.02, 0.09]	

Note: $^{**}p < 0.01$, $^{***}p < 0.001$. Bootstrap sample size = 5000. Due to missing data on age, two participants were excluded through pairwise deletion

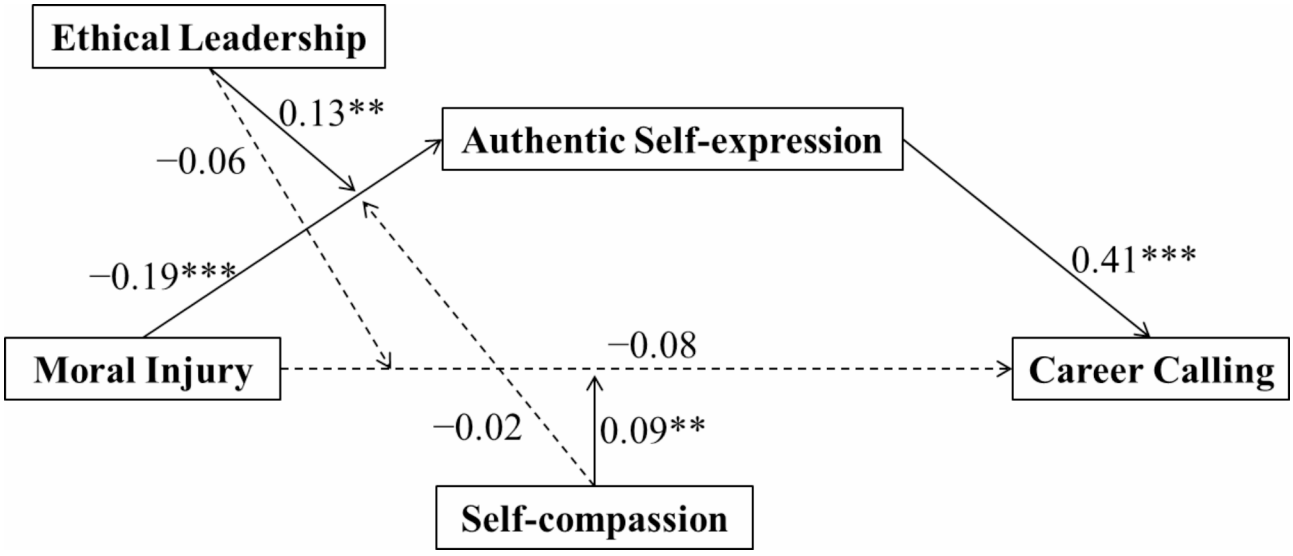

Fig. 4 The moderating effects of self-compassion and ethical leadership within the mediation model linking moral injury to career calling through authentic self-expression
Note: $N = 504$. $^{**}p < 0.01$, $^{***}p < 0.001$. Bootstrap sample size = 5000. Numbers in the model are standardized path coefficients. The dashed line indicates that the path coefficient is non-significant

Table 6 Conditional effects on different levels of ethical Leadership and Self-Compassion ($N = 504$)

	β	95% CI_{Boot}
Conditional Direct Effect of Moral Injury on Career Calling		
Low Self-Compassion ($M - SD$)	−0.19	[−0.29, −0.09]
High Self-Compassion ($M + SD$)	−0.06	[−0.16, 0.05]
Conditional Direct Effect of Moral Injury on Authentic Self-Expression		
Low Ethical Leadership ($M - SD$)	−0.31	[−0.42, −0.21]
High Ethical Leadership ($M + SD$)	−0.08	[−0.19, 0.03]
Conditional Indirect Effect of Moral Injury on Career Calling		
Low Ethical Leadership ($M - SD$)	−0.14	[−0.21, −0.08]
High Ethical Leadership ($M + SD$)	−0.04	[−0.10, 0.01]

Note: Bootstrap sample size = 5000. Due to missing data on age, two participants were excluded through pairwise deletion

leadership is low (− 1 *SD* from the mean), moral injury significantly negatively predicts career calling (β = −0.31, 95% CI = [− 0.42, − 0.21]). Conversely, when perceived ethical leadership is high (+ 1 *SD* from the mean), the effect of moral injury on career calling becomes non-significant (β = −0.08, 95% CI = [− 0.19, 0.03]). High levels of ethical leadership can mitigate the negative effects of moral injury on authentic self-expression. Thus, Hypothesis 3 was supported.

However, the results of Model 5 in Table 5 indicated a non-significant moderating effect of ethical leadership between moral injury and career calling (β = −0.06, p = 0.08). Hypothesis 4 was not supported.

Furthermore, the present study examined whether ethical leadership moderated the mediating effect of authentic self-expression. As shown in Table 5, the 95% CI for the index of moderated mediation excluded zero (β = 0.05, 95% CI = [0.02, 0.09]), indicating a significant difference between the indirect effects for high and low ethical leadership. The simple slope tests in Table 6 revealed a significant indirect effect of moral injury on career calling via authentic self-expression when ethical leadership was low (β = −0.14, 95% CI = [− 0.21, − 0.08]); however, there was no significant mediating effect of authentic self-expression when it was low (β = −0.04, 95% CI = [− 0.10, 0.01]). Thus, Hypothesis 7 was supported.

The moderating effect of self-compassion

Hypotheses 5 proposed that self-compassion moderates the direct effect of moral injury on authentic self-expression. As seen in Fig. 4 and Model 4 of Table 5, self-compassion had a non-significant moderating effect on the relationship between moral injury and authentic self-expression (β = −0.02, p = 0.52). Hypothesis 5 was not supported.

Hypotheses 6 proposed that self-compassion moderates the direct effect of moral injury on career calling. As seen in Fig. 4 and Model 5 of Table 5, self-compassion significantly moderated the relation between moral injury and career calling (β = 0.09, p < 0.01). The direct effect of moral injury on career calling varies significantly between the high-level and low-level self-compassion. As shown in Table 6, the results from the simple slope tests reveal that when healthcare workers' self-compassion is low (− 1 *SD* from the mean), moral injury significantly negatively predicts career calling (β = −0.19, 95% CI = [− 0.29, − 0.09]); conversely, when self-compassion is high (+ 1 *SD* from the mean), the effect of moral injury on career calling becomes non-significant (β = −0.06, 95% CI = [− 0.16, 0.05]). The moderating effect of self-compassion reflects its ability to weaken the negative relationship between moral injury and career calling. Thus, Hypothesis 6 was supported.

Hypothesis 8 assumed that self-compassion moderates the indirect effect of authentic self-expression between moral injury and career calling. As shown in Table 5, the 95% CI for the index of moderated mediation included zero (β = −0.01, 95% CI = [− 0.04, 0.02]), indicating that the indirect effect was not moderated by self-compassion. Hypothesis 8 was not supported.

Discussion

Previous research has demonstrated that healthcare workers' mental and behavioral health outcomes, such as increased distress, depression, and suicidal ideation, can be influenced by moral injury [5]. Experts have called for further exploration into the relationship between moral injury and the performance of healthcare workers [14, 44]. The goal of this study was to examine the effects of moral injury on healthcare workers' sense of professional purpose. First, we explored whether moral injury had a negative impact on career calling. Using the JD-R model, we investigated the role of authentic self-expression as a mediator between moral injury and career calling. In addition, we examined how ethical leadership and self-compassion might mitigate the detrimental effects of moral injury on one's sense of career calling. By doing so, our study expands the knowledge of specific psychological factors influenced by moral injury in healthcare professionals. Additionally, the research uncovers hidden mechanisms that connect moral injury to aspects such as career purpose, deepening our understanding of how moral injury can adversely affect individual performance.

Theoretical and empirical contributions

As predicted, the present study confirmed that moral injury negatively predicts healthcare workers' career calling, which is partially mediated by healthcare workers' authentic self-expression. This finding aligns with the fundamental propositions of the JD-R model, which states that job demands undermine workers' energy and resources to cause harm to their health and well-being [9]. Prior studies have shown that healthcare workers' sense of career calling is predicted by job demands, such as work-life conflicts and job emotional demands [45]. Our results again confirm the negative associations between job demands and career calling and enrich the research literature on the predictors of career calling.

Regarding the moderating mechanism, this study revealed that ethical leadership does not significantly moderate the direct impact of moral injury on healthcare workers' career calling. However, it positively moderates the indirect effect of moral injury on career calling through authentic self-expression. When healthcare workers perceive higher levels of ethical leadership, the negative impact of moral injury on healthcare workers' career calling through their authentic self-expression

would decrease and become non-significant. Previous research has indicated that organizational justice and supportive leadership are contextual antecedents of followers' authenticity [30, 46]. Ethical leaders prioritize others' well-being and take into account the ethical consequences of their decisions, thus ensuring organizational justice and offering support to followers [29, 32]. This suggests that head directors' ethical leadership serves as a job resource for healthcare workers' authentic self-expression.

In this study, ethical leadership, acting as a job resource, softens the resource depletion resulting from job demands (i.e., moral injury), aligning with the JD-R model's claims. This research expands our understanding of authenticity and authentic self-expression by introducing ethical leadership and moral injury as antecedents of authentic self-expression while also shedding light on how these factors interact to predict authentic self-expression. Furthermore, numerous studies have reported the effectiveness of ethical leadership for healthcare workers [32]. Our findings reiterate the positive impact of ethical leadership in hospital environments. Additionally, this study offers more detailed evidence regarding how ethical leadership operates in doctor and nurse populations.

In contrast to ethical leadership, self-compassion does not moderate the indirect impact of moral injury on healthcare workers' sense of career calling through authentic self-expression. However, moral injury positively moderates the direct effect of moral injury on career calling. As self-compassion strengthens, the negative impact of moral injury on healthcare workers' career calling decreases and can even become insignificant. The moderating effect of self-compassion on the relationship between moral injury and career calling supports its protective role. Past research has shown that self-compassion can lessen the harmful effects of morally injurious experiences, such as PTSD and depressive symptoms, on the mental health of veterans [47]. Our study supports these findings in a sample of doctors and nurses, strengthening the value of self-compassion when confronted with morally injurious experiences. Future research should investigate whether teaching self-compassion can help healthcare workers maintain a strong sense of career calling while experiencing moral injury.

In conclusion, researchers emphasize the significance of recognizing the protective elements that mitigate the negative impacts of moral injury on healthcare professionals' performance [14]. This study highlights ethical leadership and self-compassion as such protective factors, exploring their roles in the connection between moral injury and vocational purpose. This work contributes to a greater understanding of moral injury in the context of health professionals.

Practical implications

Moral injury presents a significant challenge in the workplace, making it essential for organizations and individuals to better withstand its harmful effects. Our findings have several practical implications:

First, our study revealed that moral injury negatively predicts healthcare workers' sense of career calling, partly by depleting their capacity for authentic self-expression. Moral injury occurs when individuals encounter events (such as witnessing unfair and unethical behavior within the healthcare system) that trigger cognitive dissonance along with feelings of guilt and shame due to their perceived inability to uphold moral values. Government and relevant healthcare authorities can develop policies aimed at reducing the likelihood of such incidents. Furthermore, high-risk events triggering moral injury can take various forms, with different individuals potentially reacting differently to the same incident. Healthcare managers can cultivate a supportive work environment through open dialogue and cultural development, enabling physicians and nurses to freely discuss their ethical dilemmas and emotions; concurrently, organizations can offer appropriate psychological support and career guidance [44]. For those experiencing moral injury, this approach may facilitate healthcare professionals' self-clarification and self-expression, thereby protecting their sense of career calling.

Second, our research shows that ethical leadership can alleviate the negative impact of moral injury on healthcare workers' career calling. This highlights the need for hospital departments to adopt ethical leadership practices. To maintain career calling strength for healthcare workers experiencing moral injury, department heads should actively promote ethical behavior in daily management. This includes establishing ethical reward and punishment systems, discussing ethical standards with their team, making fair and principled decisions, and offering ethical mentoring and support. As suggested by Brown and Treviño [29], hospitals should prioritize hiring or appointing individuals with strong ethical values and high moral intensity as department heads. Hospital managers can then help cultivate and train these ethical leaders. Past studies have demonstrated that an individual's ethical conduct can be motivated through social learning [27]. By providing moral role models and encouraging both formal and informal norms supporting ethical behavior, hospital managers can foster greater ethical awareness among leaders and teach them how to demonstrate their own ethical leadership.

Third, our research showed that self-compassion can protect against the damaging influence of moral injury on healthcare workers' career calling. Previous studies have indicated that self-compassion is a learnable skill that can be developed through interventions such as mindful

self-compassion programs [33] and self-compassionate writing exercises [48]. Hospital managers can incorporate these strategies to strengthen healthcare workers' self-compassion, ultimately minimizing the adverse effects of moral injury on their career calling.

Limitations and future directions

This study has several limitations that provide directions for future research. First, our results relied on cross-sectional data. Although cross-sectional designs could provide evidence and rule out potential alternative explanations for the correlations among variables, they limit rigid causal inferences among variables. Future studies should conduct additional experimental, longitudinal, or intervention studies to explore the temporal precedence of our main variables.

Second, our study's reliance on self-reported data to assess moral injury may have introduced an important limitation related to the pluralistic nature of moral beliefs. Given the diversity of moral values in modern society [49], what constitutes a morally injurious event can vary widely among individuals and societies [50]. Although our survey captured respondents' personal perceptions of moral injury, it is possible that some of these self-reported instances may reflect idiosyncratic or potentially distorted moral views. This could have led to an overestimation of moral injury prevalence if respondents' views were not aligned with broadly accepted standards of morality. Future research on moral injury in healthcare should strive to clarify the specific moral principles that underlie providers' experiences of injury. Studies can better discern which instances of perceived moral injury represent a violation of widely shared principles versus a reflection of potentially biased professional morality. This will be crucial for developing targeted interventions that address genuine moral injury while promoting ethical alignment within the medical profession.

Third, to provide practical support for healthcare professionals confronting moral injury, the present study primarily focused on mitigating the negative effects of moral injury on their career calling, rather than addressing the underlying causes of moral injury. Future research should further explore strategies to prevent healthcare workers from experiencing moral injury, such as identifying approaches that can reduce social injustice.

Fourth, we focused only on the mediating effect of authentic self-expression and the moderating effects of ethical leadership and self-compassion between moral injury and healthcare workers' career calling. Our findings support the core propositions of JD-R theory, which posits that the depletion of resources (e.g., authentic self-expression) and replenishment of resources (e.g., self-compassion and providing ethical leadership to healthcare workers) are important mechanisms for explaining the associations between moral injury and career calling. There are different types of jobs and personal resources [13]. Future research can include other resources (e.g., other types of positive leadership) and explore their roles to provide more ways to protect healthcare workers' career calling against moral injury. Finally, our data were collected from Chinese healthcare workers. Moral injury is caused by actions or events that go against individuals' internal moral standards. However, different cultures and occupations have distinct professional ethics, suggesting that we consider these potential distinctions. Our sample's limited generalizability suggests that future research could replicate and extend these findings to other cultural or occupational contexts.

Conclusion

In conclusion, the current research indicates that moral injury negatively impacts healthcare workers' sense of career calling. This detrimental effect occurs through the suppression of authentic self-expression among these professionals. When faced with moral injury, healthcare workers may struggle to express their true selves, ultimately affecting their career calling experience. However, ethical leadership and self-compassion can help mitigate the negative impact of moral injury on career calling. The influence of a department head's ethical leadership can reduce the damage caused by moral injury to a healthcare worker's authentic self-expression, enabling them to follow their true selves and develop a strong sense of career calling. Furthermore, cultivating self-compassion among healthcare workers can safeguard their career calling from the harmful effects of moral injury. Our research offers valuable strategies for managing the adverse consequences of moral injury in the workplace.

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Author contributions

Lei Sun played a lead role in data curation, formal analysis, investigation, project administration, software, supervision, visualization, an equal role in conceptualization, methodology, validation, writing– original draft, and writing–review and editing; Feifei Li played a lead role in formal analysis, investigation, project administration, software, funding acquisition, visualization, and an equal role in conceptualization, methodology, writing–original draft, and writing–review and editing; Fanli Jia played an equal role in conceptualization, methodology, writing–original draft, reviewing, and editing.

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Data availability

The data presented in this study are available upon request from the corresponding author.

Declarations

Ethics approval and consent to participate
All procedures performed in the study were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments. This study was conducted with approval by the Academic Committee at the School of Philosophy and Sociology at Jilin University, China. Informed consent to participate was obtained from all the participants in the study.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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