

Moral Injury in Medical Students: A Review of Associated Factors and Intervention Strategies

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Abstract: Moral injury is a critical moral and psychological issue in medical education, profoundly affecting students' well-being and professional identity. Traditional constructs like moral distress and burnout fail to fully capture its moral essence and structural roots. This review synthesizes current knowledge on the conceptualization, distinguishing features, associated factors, and intervention strategies of moral injury in medical students. It suggests strengthening multi-level interventions, clarifying conceptual boundaries, and developing targeted assessment tools to protect students' moral integrity, providing a reference for medical education practice and future research.

Keywords: Medical students; Moral injury; Associated factors; Intervention strategies

1 Introduction

Medical education is not only a technical and cognitive process but also a deeply moral journey (Cruess et al., 2014; Wald, 2015; Kim et al., 2024). From the beginning of their training, medical students are required to internalize professional values such as beneficence, respect for persons, integrity, and justice, while navigating the complexities of clinical environments marked by uncertainty, hierarchy, and competing demands (Chandran et al., 2019). Throughout their training, especially during the transition to clinical practice, students face ethically challenging situations, including witnessing patient suffering, observing substandard care, and engaging in decisions that conflict with their moral beliefs (Ribeiro et al., 2021; Hawking et al., 2020). These emotionally charged experiences can have a lasting impact on students' well-being, learning, and professional identity development (Ribeiro et al., 2021; Lönn et al., 2023).

Traditionally, medical education has relied on concepts like professionalism, ethical decision-making, and moral distress to describe students' ethical struggles (Monrouxe, Shaw, & Rees, 2017; Berger, 2014). Moral distress, in particular, has been widely used to address situations where learners recognize

the ethically appropriate action but feel unable to act due to external or internal constraints, such as hierarchical power structures (Deschenes et al., 2020; Camp & Sadler, 2019). However, this framework has limitations, as it does not fully capture the depth, persistence, or moral significance of the suffering experienced in clinical training (McCarthy & Gastmans, 2015; Sanderson et al., 2019).

The concept of moral injury has emerged as an alternative framework to address morally rooted psychological distress (Cartolovni et al., 2021). It describes the profound emotional and existential suffering that arises when individuals are involved in, witness, or fail to prevent actions that violate their deeply held moral values, particularly in settings marked by power imbalances (Williamson et al., 2021). Unlike burnout, which focuses on emotional exhaustion, moral injury centers on the violation of moral integrity (Rosen, Cahill, & Dugdale, 2022). While moral injury has been explored in the context of healthcare professionals, its application to medical students remains under-explored and fragmented (Cartolovni et al., 2021; Mewborn et al., 2023).

Although research on moral injury has been largely concentrated in Western contexts, studies on moral injury among medical students in China and

other Asian countries are still in the early stages. Given the cultural and educational differences, the findings from Western studies may not fully apply to Chinese medical students. Therefore, this review not only aims to address the limitations of current frameworks but also to emphasize the value of studying moral injury within the specific context of medical education in China. By highlighting the unique challenges faced by students, especially in culturally distinct environments, this research aims to contribute to a deeper understanding of their moral suffering and provide valuable insights for the development of effective educational strategies to protect and preserve students' moral integrity during training.

2 Methodology

This review employs a narrative synthesis approach to examine the literature on moral injury in medical students. A systematic search was conducted across PubMed, Scopus, and PsycINFO using keywords such as “moral injury,” “medical students,” and “moral distress.” Studies published from January 1990 to December 2025 were included, focusing on empirical research, theoretical frameworks, and reviews related to moral injury in medical students or healthcare professionals.

Selection criteria included peer-reviewed articles addressing moral injury or related concepts, while studies not focusing on medical students or lacking methodological rigor were excluded. A total of 45 relevant studies were reviewed to identify key themes and interventions.

3 Conceptualizing moral injury in medical students

3.1 Origins and core features of moral injury

Moral injury was originally developed to describe the psychological and moral suffering in military veterans exposed to events that violated their deeply held moral beliefs (Griffin et al., 2019; Litz, 2025; Williamson et al., 2021). Unlike fear-based trauma, it centers on violations of moral expectations and values in contexts marked by authority and power imbalances (Čartolovni et al., 2021; Deschenes et al.,

2020). Core features include exposure to potentially morally injurious events (PMIEs), moral transgressions through action or inaction, and enduring emotional consequences like guilt, shame, and a loss of trust (Griffin et al., 2019; Webb et al., 2024).

Moral injury is not defined solely by exposure to ethically challenging events, but by the individual's moral appraisal of those events and their implications for self and moral identity (Griffin et al., 2019; Mewborn et al., 2023). It involves moral dissonance, self-condemnation, and difficulty integrating the experience into one's moral framework (Čartolovni et al., 2021). Importantly, moral injury is not a psychiatric diagnosis but provides a morally grounded framework for understanding suffering not fully captured by post-traumatic stress disorder (PTSD) depression (Williamson et al., 2021; Griffin et al., 2019).

Three key components consistently emerge: exposure to PMIEs, moral appraisal, and enduring psychological impact (Griffin et al., 2019; Čartolovni et al., 2021). This structure is relevant when considering moral injury in medical students, who often face morally challenging situations in environments where responsibility and agency are unevenly distributed (Murray, Krahé, & Goodsman, 2018; Ribeiro et al., 2021).

3.2 Moral injury in healthcare and medical education

In recent years, the concept of moral injury has been increasingly applied to healthcare settings to describe clinicians' distress arising from systemic constraints that prevent them from acting in accordance with professional and moral ideals (Čartolovni et al., 2021; Buchbinder et al., 2024). It highlights experiences of moral compromise related to resource scarcity, institutional policies, administrative pressures, and perceived betrayals by healthcare systems (Rabin et al., 2023; Hegarty et al., 2022). This shift from military to healthcare contexts has underscored the moral dimensions of work environments where individuals are repeatedly required to act against their moral convictions (Čartolovni et al., 2021; Webb et al., 2024).

Medical education provides a particularly relevant context for applying moral injury, given the unique position of medical students within healthcare systems (Murray, Krahé, & Goodsman, 2018; Nemiroff et al., 2024). Students are immersed in clinical en-

vironments where ethical tensions are common, yet they typically lack decision-making authority and are highly dependent on supervisors for evaluation and progression (Ong et al., 2022; Cho et al., 2022). As a result, students may witness harmful, unjust, or disrespectful practices without the ability to intervene or voice concerns (Ribeiro et al., 2021; Mæland et al., 2021).

Qualitative studies suggest that these situations often provoke strong emotional reactions such as guilt, shame, anger, and feelings of moral failure, especially when inaction is perceived as complicity (Ribeiro et al., 2021; Murray et al., 2018). These experiences occur during critical periods of professional identity development, influencing students' internalization of professional values and long-term attitudes toward patients, colleagues, and healthcare institutions (Lönn et al., 2023; Kim et al., 2024). Applying the concept of moral injury to medical students shifts the focus from individual resilience deficits to the moral and structural conditions of training (Čartolovni et al., 2021).

3.3 Distinguishing moral injury from related constructs

3.3.1 Moral injury and moral distress

Moral distress has long been used to describe the experience of knowing the ethically right action but being unable to carry it out due to internal or external constraints (Jameton, 2017; Deschenes et al., 2020). In medical education, it is often reported by students constrained by hierarchy, institutional norms, or fear of negative evaluation (Berger, 2014). While moral distress highlights ethical tensions and constrained agency, moral injury differs in both depth and trajectory. Unlike moral distress, which is situational and transient, moral injury involves deeper moral transgressions that threaten one's moral integrity and identity (Čartolovni et al., 2021). It includes moral appraisal, such as self-blame and perceived betrayal (Williamson et al., 2021), and repeated moral distress may evolve into moral injury over time (Čartolovni et al., 2021).

For medical students, distinguishing between moral distress and moral injury is important. Not all moral discomfort should be labeled as moral injury, especially in hierarchical environments where ethical frustrations are common (Nemiroff et al., 2024; Ri-

beiro et al., 2021). Conceptual clarity is needed to assess whether experiences are perceived as moral transgressions with lasting impact or as isolated ethical frustrations (Griffin et al., 2019; Sanderson et al., 2019). Viewing moral distress and moral injury along a continuum is more productive than treating them as separate concepts (Čartolovni et al., 2021; Beadle et al., 2024).

3.3.2 Moral injury and burnout

Burnout is commonly characterized by emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment. In medical education, burnout has been widely studied as an outcome of workload, stress, and learning environment factors. While burnout may co-occur with moral injury, the two constructs are conceptually distinct (Dean et al., 2024; Scott, Stickrath, & Rowh, 2026; Ong et al., 2022; Beck et al., 2023).

Burnout frameworks tend to focus on depletion of emotional and cognitive resources, often implying a mismatch between individual capacity and environmental demands. In contrast, moral injury centers on violations of moral meaning and integrity, emphasizing ethical conflict rather than exhaustion per se. From this perspective, burnout may be a downstream consequence of unresolved moral injury, rather than its primary cause (Dzeng & Wachter, 2019; Griffin et al., 2019; Čartolovni et al., 2021; Rosen, Cahill, & Dugdale, 2022).

For medical students, conflating moral injury with burnout risks obscuring the moral dimensions of their experiences and reinforcing narratives that place responsibility on individual coping rather than on educational and institutional structures. Maintaining conceptual distinction allows educators to better identify morally injurious experiences and to design interventions that address ethical climate, supervision, and support, rather than solely promoting resilience or stress management (Nemiroff et al., 2024; Ribeiro et al., 2021; Cho et al., 2022; Mewborn et al., 2023).

4 Factors associated with moral injury in medical students

Moral injury in medical students does not arise from a single source but rather from the interaction of

individual vulnerabilities, educational and clinical training conditions, and broader institutional and systemic contexts (Nemiroff et al., 2024; Ribeiro et al., 2021; Ong et al., 2022). Understanding these associated factors is essential for identifying at-risk students and for designing effective, ethically grounded interventions (Beadle et al., 2024; Mewborn et al., 2023; Scott, Stickrath, & Rowh, 2026). Drawing on the existing literature, factors associated with moral injury in medical students can be meaningfully organized across three interrelated levels: individual, educational and clinical, and systemic or institutional (Griffin et al., 2023; Čartolovni et al., 2021; Sarraf-Yazdi et al., 2021).

4.1 Individual-level factors

At the individual level, moral injury is shaped by students' moral sensitivity, values, expectations, and developmental stage (Hawking et al., 2020; Lönn et al., 2023; Cho et al., 2022). Many medical students enter training with strong moral ideals centred on altruism, patient-centred care, and a desire to alleviate suffering. When these ideals collide with clinical realities—such as time pressures, compromised care, or perceived injustice—students may experience intense moral dissonance (Ribeiro et al., 2021; Nemiroff et al., 2024; Camp & Sadler, 2019). High moral sensitivity, while often considered a professional virtue, may therefore increase vulnerability to moral injury when students repeatedly encounter situations that contradict their moral expectations (Hawking et al., 2020; Lönn et al., 2023; Monrouxe, Shaw, & Rees, 2017).

The stage of professional identity formation also plays a critical role (Sarraf-Yazdi et al., 2021; Wald, 2015; Quaintance et al., 2025). Medical students are actively constructing their understanding of what it means to be a doctor, and morally challenging experiences during this period may be internalized as reflections of personal failure or moral inadequacy (Ribeiro et al., 2021; Monrouxe, Shaw, & Rees, 2017; Lönn et al., 2023). Feelings of guilt and shame are particularly salient when students perceive themselves as complicit in harm through silence or inaction, even when they lack formal responsibility or authority (Griffin et al., 2019; Mewborn et al., 2023; Ribeiro et al., 2021). Such appraisals may be amplified by perfectionistic tendencies, unrealistic self-expectations, or a strong sense of personal responsibility for patient outcomes (Cho et al., 2022; Scott, Stickrath, & Rowh, 2026;

Ong et al., 2022).

Emotional and psychological factors further influence susceptibility to moral injury (Ong et al., 2022; Mæland et al., 2021; Scott, Stickrath, & Rowh, 2026). Limited prior exposure to suffering, death, or ethical complexity may leave students less prepared to process morally injurious experiences (Murray et al., 2018; Schrepel et al., 2019; Mæland et al., 2021). Additionally, students with fewer coping resources, lower perceived self-efficacy, or limited access to social support may struggle to integrate morally troubling experiences in adaptive ways (Ong et al., 2022; Scott, Stickrath, & Rowh, 2025; Krishnasamy, Hasamnis, & Patil, 2022). Importantly, these individual factors should not be interpreted as intrinsic deficits but rather as characteristics that interact with educational and institutional conditions to shape moral appraisal and impact (Nemiroff et al., 2024; Sarraf-Yazdi et al., 2021; Čartolovni et al., 2021).

4.2 Educational and clinical training factors

Educational and clinical training environments constitute a central context in which moral injury may emerge. One of the most consistently identified factors is hierarchical power asymmetry. Medical students occupy a subordinate position within clinical teams, often dependent on supervisors for evaluation, progression, and future career opportunities. This hierarchy may discourage students from questioning decisions, reporting concerns, or acting on moral convictions, even when they witness practices they perceive as unethical or harmful (Nemiroff et al., 2024; Ribeiro et al., 2021; Schrepel et al., 2019; Ong et al., 2022).

Role ambiguity further compounds this vulnerability. Students may be uncertain about their responsibilities, limits of authority, and expectations in clinical settings, particularly during early clinical exposure. This ambiguity can create situations in which students feel morally responsible for patient outcomes while simultaneously feeling powerless to intervene. Such conditions are especially conducive to moral injury, as they combine moral salience with constrained agency (Cho et al., 2022; Mæland et al., 2021; Monrouxe, Shaw, & Rees, 2017).

Assessment pressure and the evaluative culture of medical education also contribute to moral vulnerability. Fear of negative evaluation, reputational dam-

age, or being labeled as “difficult” may lead students to suppress moral concerns or prioritize conformity over ethical integrity. Over time, repeated experiences of moral compromise may become normalized through the hidden curriculum, reinforcing the perception that ethical ideals are incompatible with clinical success (Nemiroff et al., 2024; Camp & Sadler, 2019; Scott, Stickrath, & Rowh, 2026).

Witnessing unethical or unprofessional behaviour by role models represents another significant educational factor. When students observe supervisors engaging in practices that conflict with espoused professional values—such as disrespectful communication, inequitable care, or neglect of patient autonomy—these experiences may be particularly injurious. The moral impact is intensified when such behaviour goes unacknowledged or is tacitly endorsed within the learning environment, undermining students’ trust in professional norms and institutional commitments (Hawking et al., 2020; Ribeiro et al., 2021; Band & Chokshi, 2025).

4.3 Systemic and institutional factors

Beyond individual and educational contexts, systemic and institutional factors play a critical role in shaping the moral landscape of medical training. Resource constraints, time pressures, and organizational priorities that emphasize efficiency over care quality may place students in environments where moral compromise is routine rather than exceptional. Exposure to such conditions may convey implicit messages about what is valued within the healthcare system, contributing to moral disillusionment (Buchbinder et al., 2024; Beck et al., 2023; Rosen, Cahill, & Dugdale, 2022; Mewborn et al., 2023).

The absence of formal structures for ethical reflection and moral support further increases the risk of moral injury. In many training settings, students lack safe and accessible spaces to discuss morally troubling experiences, process emotional responses, or seek guidance without fear of judgement or reprisal. When institutional responses to moral concerns are perceived as dismissive or punitive, students may experience a sense of betrayal that deepens moral injury (Nemiroff et al., 2024; Ong et al., 2022; Berger, 2014; Mæland et al., 2021).

Institutional culture also shapes whether moral suffering is recognized as legitimate. Environments

that valorise stoicism, endurance, and emotional suppression may inadvertently discourage help-seeking and moral dialogue. In such cultures, students may interpret moral distress or injury as personal weakness rather than as a signal of ethical strain within the system. This framing not only exacerbates individual suffering but also impedes organizational learning and moral repair (Scott, Stickrath, & Rowh, 2026; Ribeiro et al., 2021; Lönn et al., 2023; Sarraf-Yazdi et al., 2021).

Importantly, systemic factors highlight that moral injury in medical students is not merely an individual or educational issue but a structural one. Framing moral injury as a consequence of institutional conditions shifts responsibility away from individual students and toward the educational and healthcare systems that shape their experiences. This perspective is essential for developing interventions that address root causes rather than symptoms (Čartolovni et al., 2021; Beadle et al., 2024; Griffin et al., 2023; Buchbinder et al., 2024). Taken together, these multi-level factors interact dynamically and may culminate in moral appraisal processes that threaten students’ developing professional identity (see Figure 1).

5 Intervention strategies to prevent and address moral injury in medical students

Given the multi-level factors associated with moral injury in medical students, effective intervention strategies must extend beyond individual coping and address educational practices and institutional structures. The literature suggests that moral injury cannot be prevented or repaired through a single intervention; rather, a coordinated, multi-layered approach is required to support moral meaning-making, restore moral integrity, and reduce exposure to preventable morally injurious conditions (Beadle et al., 2024; Čartolovni et al., 2021; Morley et al., 2021; Griffin et al., 2023). This section synthesizes intervention strategies at three levels: individual-focused, educational and faculty-level, and institutional or curriculum-level approaches.

5.1 Individual-focused interventions

At the individual level, interventions aim to support students in recognizing, processing, and integrat-

ing morally challenging experiences. Reflective practices are among the most commonly proposed strategies in medical education. Structured reflective writing, narrative medicine approaches, and guided journaling can provide students with opportunities to articulate moral conflict, examine emotional responses such as guilt or shame, and reconnect experiences to professional values (Camp & Sadler, 2019; Wald, 2015; Ong et al., 2022). When appropriately facilitated, these practices can help transform morally injurious experiences into sources of moral growth rather than moral residue.

Psychological and emotional support interventions also play an important role. Access to confidential counselling services, peer support programmes, and mentoring relationships may assist students in processing morally injurious experiences without fear of judgement or academic consequences (Mewborn et al., 2023; Scott, Stickrath, & Rowh, 2026; Krishnasamy, Hasamnis, & Patil, 2022). Importantly, such supports should be framed not as remediation for individual weakness but as legitimate responses to ethically challenging training environments. Normalizing help-seeking and moral vulnerability is essential to reducing stigma and encouraging early engagement with support mechanisms.

Emerging literature also highlights the potential role of moral resilience and self-compassion training. These approaches focus on strengthening students' capacity to maintain moral integrity in the face of ethical adversity, rather than encouraging accommodation to morally compromised conditions (Beadle et al., 2024; Griffin et al., 2023; Rosen, Cahill, & Dugdale, 2022). However, individual-focused interventions alone are insufficient if systemic sources of moral injury remain unaddressed. Without parallel changes in educational and institutional contexts, such interventions risk placing responsibility for moral repair disproportionately on students (Čartolovni et al., 2021; Buchbinder et al., 2024).

5.2 Educational and faculty-level interventions

Educational and faculty-level interventions are central to preventing moral injury in medical students, as they directly shape the learning environments in which morally injurious experiences occur. One key strategy involves creating structured, psychologically safe spaces for moral dialogue within the curriculum.

Ethics rounds, facilitated small-group discussions, and longitudinal reflective seminars can enable students to share experiences, explore moral perspectives, and receive validation from peers and faculty (Chandran et al., 2019; Monrouxe, Shaw, & Rees, 2017; Sarraf-Yazdi et al., 2021). Crucially, these activities should prioritize open-ended reflection over prescriptive ethical solutions, recognizing the moral complexity of clinical practice.

Faculty development represents another critical intervention domain. Clinical supervisors and educators play a powerful role in modelling moral reasoning, responding to ethical concerns, and legitimizing students' moral experiences. Training faculty to recognize signs of moral distress and moral injury, to respond non-defensively to student concerns, and to engage in reflective dialogue can significantly reduce students' sense of isolation and perceived betrayal (Nemiroff et al., 2024; Ribeiro et al., 2021; Cruess et al., 2014). Faculty who openly acknowledge ethical uncertainty and moral tension may also help counteract the hidden curriculum that normalizes moral compromise.

Supervisory practices and assessment cultures should likewise be examined through a moral lens. Reducing punitive responses to ethical questioning, clarifying expectations around professional conduct, and explicitly valuing moral courage and ethical reflection can mitigate the moral risks associated with hierarchical training structures (Scott, Stickrath, & Rowh, 2026; Cho et al., 2022; Ong et al., 2022). When students perceive that moral integrity is recognized and supported within educational evaluation systems, they may be more willing to voice concerns and engage in moral repair processes.

5.3 Institutional and curriculum-level strategies

At the institutional level, preventing and addressing moral injury requires explicit recognition of moral injury as an educational and organizational issue. Institutions should move beyond individualized narratives of resilience and explicitly address structural conditions that contribute to moral compromise, such as excessive workload, inadequate supervision, and lack of ethical support mechanisms (Buchbinder et al., 2024; Rabin et al., 2023; Rosen, Cahill, & Dugdale, 2022). Embedding moral injury awareness into institutional policies signals a commitment to protecting

students' moral integrity.

Curriculum design offers a critical opportunity for systemic intervention. Integrating longitudinal ethics education that addresses real-world moral complexity, power dynamics, and moral emotions can better prepare students for ethically challenging clinical environments (Sarraf-Yazdi et al., 2021; Band & Chokshi, 2025; Hawking et al., 2020). Rather than confining ethics teaching to abstract principles, curricula should incorporate case-based discussions drawn from students' lived experiences, explicitly addressing moral uncertainty, moral failure, and moral repair.

Institutional reporting and support systems also warrant attention. Clear, confidential, and non-punitive pathways for raising ethical concerns can reduce students' fear of reprisal and feelings of moral entrapment (Nemiroff et al., 2024; Berger, 2014; Mæland et al., 2021). When concerns are acknowledged and addressed transparently, institutions can help prevent experiences of institutional betrayal that may exacerbate moral injury. Importantly, feedback loops should be established so that students are informed of how concerns are handled, reinforcing trust and moral accountability.

Finally, institutional culture plays a decisive role

in shaping moral experience. Cultures that valorise endurance, silence, or emotional detachment may inadvertently intensify moral injury by delegitimizing moral suffering. In contrast, cultures that encourage reflection, dialogue, and ethical humility create conditions for moral repair and professional growth (Lönn et al., 2023; Scott, Stickrath, & Rowh, 2026; Čartolovni et al., 2021). Addressing moral injury at this level requires sustained leadership engagement and a willingness to examine how organizational values are enacted in daily educational practice.

Based on the multi-level factors and corresponding intervention strategies discussed above, a conceptual framework is proposed (Figure 1). This framework illustrates the dynamic mechanism of moral injury in medical students and the corresponding multi-level intervention system. It clarifies that moral injury stems from the interaction of individual, educational, and institutional factors, which further trigger moral appraisal and threaten professional identity. Corresponding targeted intervention strategies at individual, educational, and institutional levels are matched to the above factors, highlighting the necessity of coordinated multi-layered interventions for moral injury prevention and repair.

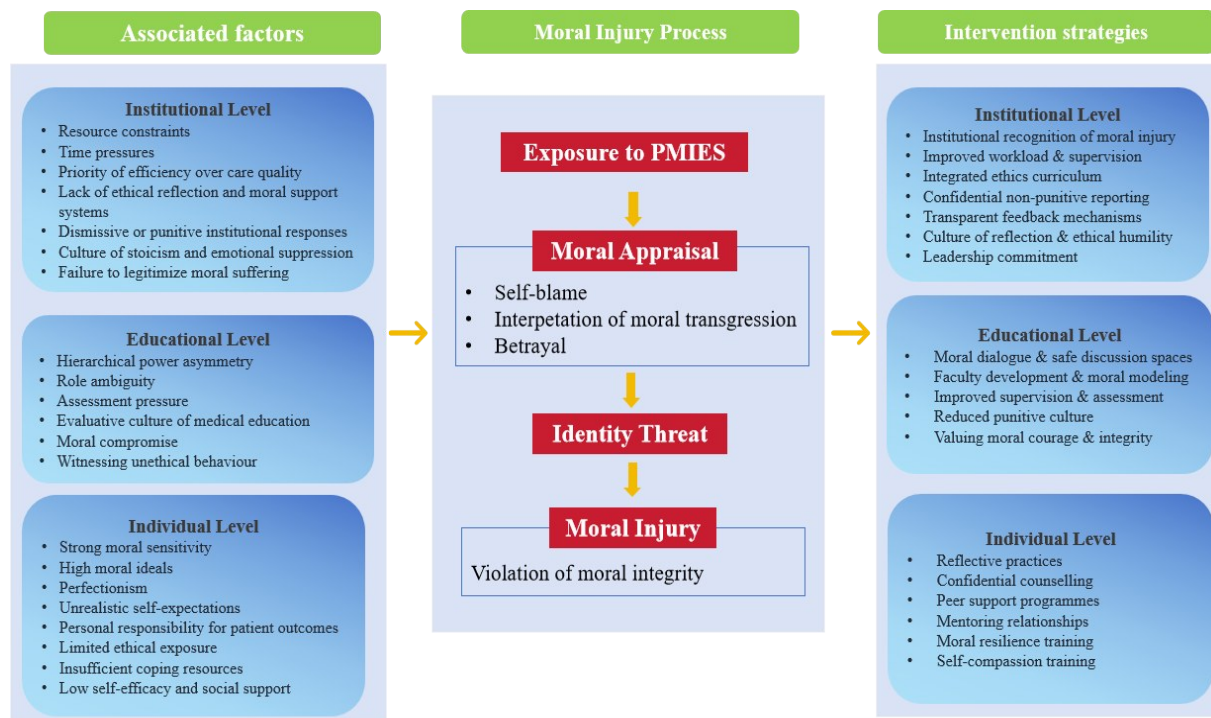


Figure 1 Conceptual framework of moral injury in medical students

6 Implications for medical education

Synthesizing the existing literature on moral injury in medical students has significant implications for medical education. Conceptualizing students' moral suffering through the lens of moral injury challenges the traditional view that frames distress primarily as an individual issue of resilience or coping. As illustrated in Figure 1, moral injury emerges from the dynamic interaction of multi-level factors and culminates in moral appraisal processes that may threaten professional identity, thereby requiring coordinated responses across individual, educational, and institutional domains. This perspective emphasizes the ethical and structural conditions within medical training environments and underscores the responsibility of educational systems to protect and repair students' moral integrity.

Recognizing moral injury shifts the focus from individual weakness to the moral and organizational aspects of the learning environment. It highlights the need for medical educators to understand distress as rooted in perceived moral transgressions, betrayal, or compromised integrity. This reframing encourages a more comprehensive approach to student well-being, one that involves addressing the systemic issues contributing to moral injury rather than focusing solely on stress management.

Curriculum design should incorporate ethical education that addresses real-world moral challenges, integrating these experiences into students' professional identity formation. Structured, reflective spaces in the curriculum can help students process these challenges, reducing the risk of moral injury. Faculty development initiatives are also critical, ensuring that supervisors are equipped to recognize and respond to moral injury and related forms of moral suffering.

At the institutional level, addressing moral injury requires the recognition of systemic issues that contribute to moral distress. Institutions should create supportive structures for students, including safe reporting mechanisms and ethical reflection spaces. These changes are necessary to foster a learning environment that prioritizes moral integrity and prepares students to navigate the complex ethical landscape of medical practice.

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Conflict of interest

The authors declare that they have no conflict of interest.

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