

Review Article



# Education on whistleblowing in medicine: A scoping review

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## Abstract

**Background:** Whistleblowing is critical to promoting patient safety, ethical accountability, and systemic improvement. Despite its importance, medical trainees often face cultural, organizational, and personal barriers to speaking up. While medical education plays a key role in shaping future physicians' preparedness to whistleblow, the scope and effectiveness of existing educational approaches remain unclear.

**Objective:** This scoping review aimed to explore how whistleblowing is currently taught, supported, or assessed in undergraduate and postgraduate medical education, and to identify gaps and opportunities for curricular development.

**Methods:** Following the JBI methodology and PRISMA-ScR guidelines, we conducted a comprehensive search across six databases (MEDLINE, Embase, ERIC, Scopus, Web of Science, PsycINFO) and grey literature sources. Studies were eligible if they addressed educational strategies related to whistleblowing among medical students, residents, or early-career physicians. After removing 1,208 duplicates from an initial yield of 3,742 records, 2,534 titles and abstracts were screened. A total of 78 articles underwent full-text review, and 13 met all inclusion criteria.

**Results:** Thirteen peer-reviewed studies were included. Thematic analysis revealed four major domains: (1) educational strategies, (2) learner attitudes and preparedness, (3) institutional and cultural contexts, and (4) virtue ethics and empowerment. More than half of the articles described education that addressed whistleblowing implicitly within professionalism or patient safety modules. Students commonly reported fear, uncertainty, and lack of institutional support as barriers. Programs with an intended emphasis on ethics, emphasized moral development, institutional transparency, and psychological safety showed more promising outcomes.

**Conclusion:** Whistleblowing education in medical education remains limited, inconsistently implemented, and rarely evaluated. Few studies explicitly assessed learners' knowledge, skills, or preparedness to whistleblow, with most relying on indirect measures such as attitudes or moral reasoning. To better prepare future physicians, curricula should integrate explicit whistleblowing content, incorporate robust assessment strategies, foster ethical resilience, and be supported by institutional cultures that empower and protect those who speak up.

## Introduction

Whistleblowing—the act of reporting unsafe, unethical, or unprofessional behaviour in healthcare—is essential for patient safety, quality improvement, and ethical accountability. By calling attention to wrongdoing, whistleblowing not only prevents harm but also fosters a culture of transparency and continuous learning.<sup>1,2</sup> When such reporting is absent or discouraged, unsafe practices may persist, preventable harm to patients can occur, and systemic problems remain unaddressed. Despite its critical role, healthcare professionals often face formidable barriers to speaking up. These include cultural factors such as a pervasive blame culture,<sup>3</sup> the normalization of deviance,<sup>1</sup> and hierarchical authority gradients that discourage junior staff from challenging senior colleagues.<sup>4</sup> Organizational challenges—such as inefficient reporting systems<sup>5</sup>, lack of feedback following a report,<sup>1,6</sup> and fear of retaliation or

reputational harm<sup>7</sup>—further compound the reluctance to report. Personal deterrents, including fear of judgment,<sup>4</sup> burnout, and moral injury,<sup>1,8</sup> also play a role. Moreover, an individual's ethical orientation significantly influences their likelihood of whistleblowing, with stronger ethical positions correlating with greater willingness to report.<sup>9</sup>

Medical education holds promise as a platform to prepare future physicians to recognize and respond to professional misconduct, instilling the skills, values, and confidence needed to navigate complex ethical challenges. However, existing educational efforts on whistleblowing within undergraduate and postgraduate curricula remain inconsistent and often insufficient. Practical strategies have been proposed to support student recognition and reporting of unprofessional behaviour, including embedding robust institutional infrastructures to facilitate concern reporting.<sup>10,11</sup> Barriers faced by medical

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students have been documented, with recommendations for curriculum reform to enhance patient safety and improve student preparedness.<sup>12–14</sup> A critique of current educational approaches has highlighted an overemphasis on individual responsibility and a lack of focus on systemic and organizational contributors to healthcare failures, reinforcing the need to embed ethics and safety more deeply within education.<sup>15,16</sup> Interactive curricula have been developed to engage students in identifying, reporting, and analyzing medical errors, offering practical models for incorporating whistleblowing education.<sup>4,17</sup>

Additional research underscores the limited progression in students' attitudes toward whistleblowing across their education, suggesting current approaches may be insufficient to shift behaviour.<sup>18</sup> Integrating virtue ethics and portable digital tools has been suggested as a means of supporting ethical development and encouraging reporting behaviours.<sup>19</sup> Studies of the whistleblowing process have detailed how healthcare trainees move from suspicion to action, identifying common types of wrongdoing and advocating for better support structures within educational settings.<sup>20,21</sup> Moral courage, while present among healthcare professionals, may be strengthened further through intentional education interventions.<sup>22,23</sup> Importantly, relatively few studies have examined how whistleblowing is assessed within medical education, and existing evaluations often rely on indirect measures such as attitudes or self-reported confidence rather than observed skills or behaviours.

Although the importance of whistleblowing is widely recognized, few studies have systematically mapped how this topic is addressed in medical education. This scoping review aimed to explore how whistleblowing is currently taught, supported, or assessed in undergraduate and postgraduate medical education, and to identify gaps and opportunities for curricular development, including in assessment practices.

## Methods

This scoping review was conducted in accordance with the JBI methodology for scoping reviews and was reported following the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) guidelines.<sup>24</sup> The objective was to systematically map the existing literature on how whistleblowing is taught, supported, or assessed in medical education.

Eligible studies included those involving medical students (both undergraduate and postgraduate), residents, or early-career physicians. The review focused on educational interventions, curricula, training, or assessments related to whistleblowing, speaking up, or reporting unprofessional behaviour. Studies were included if they were situated within medical education contexts such as universities, teaching hospitals, or

clinical rotations. Eligible sources included peer-reviewed empirical studies, reviews, commentaries, and relevant grey literature, including but not limited to institutional reports, policy documents, and theses. Only studies published in English from January 2000 to February 2025 were included to ensure relevance to contemporary educational practices.

A comprehensive literature search was performed across six electronic databases: MEDLINE (Ovid), Embase, ERIC, Scopus, Web of Science, and PsycINFO. These databases were selected to capture the breadth of healthcare, education, and psychology literature, as whistleblowing behaviours are shaped by ethical, decision-making, and psychosocial factors. In addition to the academic database search, the grey literature search was structured and targeted, using Google Scholar, institutional repositories (e.g., university archives), and websites of medical education organizations such as the Association of American Medical Colleges (AAMC), General Medical Council (GMC), and other relevant national bodies. The search strategy combined keywords and Boolean operators, using terms such as “whistleblower,” “speak up,” “report misconduct,” “report error,” “professionalism,” “medical education,” “clinical training,” “residency,” “curriculum,” and “medical student.” The complete search strategy for MEDLINE is provided in [Supplementary file](#).

Following deduplication, two independent reviewers screened titles and abstracts against the eligibility criteria. Grey literature sources were reviewed in full at the initial screening stage, given their shorter length and targeted focus, whereas peer-reviewed articles underwent separate full-text screening. Full-text screening was then conducted by two reviewers on studies that met the initial criteria. Discrepancies during the screening process were resolved through discussion, with a third reviewer available to mediate unresolved disagreements.

Data were extracted using a standardized charting form, which was a predefined data extraction template capturing consistent variables across all sources. Variables included author, year, country, study design, population and training level, description of any educational intervention, and reported outcomes or themes related to whistleblowing. Additional data were collected on identified barriers and facilitators to whistleblowing, as well as the ethical or institutional framing of the topic within the curriculum. Peer-review status was documented only for journal-published studies, not for grey literature sources.

Thematic analysis was used to synthesize the extracted data. Findings were organized to identify common patterns across educational strategies, learner responses, and institutional approaches to whistleblowing training in medical education. This approach enabled the identification of curricular gaps, variations in implementation, and recommendations for future

educational development.

## Results

The initial database and grey literature search yielded 3,742 records. After removing 1,208 duplicates, 2,534 unique records remained for title and abstract screening. Based on the inclusion criteria, 78 studies were selected for full-text review. This included 65 peer-reviewed articles and 13 grey literature sources. Following a detailed assessment, 13 studies met all eligibility criteria and were included in the final synthesis. Reasons for exclusion at the full-text stage included lack of relevance to medical education, absence of educational content related to whistleblowing, and non-empirical formats such as editorials or letters without substantive descriptions of training or outcomes.

A total of 13 peer-reviewed papers were included in the final synthesis (Table 1). Thematic analysis was conducted by our review team on the data extracted from the included studies. These studies explored how whistleblowing is addressed in medical education, revealing four major themes: (1) educational strategies, (2) learner attitudes and preparedness, (3) institutional and cultural contexts, and (4) virtue ethics and empowerment. Of the 13 studies, 8 embedded whistleblowing content within broader professionalism, ethics, or patient safety curricula, while 5 addressed whistleblowing explicitly as a distinct topic. While some educational efforts addressed whistleblowing explicitly, most were embedded within broader professionalism, ethics, or patient safety curricula. Across

studies, learners consistently reported uncertainty, fear, and ethical conflict related to speaking up, highlighting the need for targeted interventions. A supportive institutional culture, clear reporting systems, and attention to moral development emerged as key enablers for future curricular design. Only 4 of the 13 studies described any form of assessment, and these predominantly relied on indirect measures (e.g., self-reported attitudes or confidence) rather than observed skills or behaviours.

## Educational Strategies

Whistleblowing was most commonly taught implicitly through ethics, professionalism, or patient safety modules, and was taught independently. Various educational strategies have been proposed, including a set of twelve tips designed to build student capacity to recognize and report unprofessional behaviour, emphasizing supportive environments and actionable reporting structures.<sup>10</sup> Other work advocates for a shift from focusing solely on individual responsibility to addressing broader organizational failures, suggesting that integration of medical ethics and systems-based safety content can better contextualize whistleblowing.<sup>15</sup> Research has shown limited improvement in students' willingness to report misconduct throughout their education, indicating current interventions may be insufficient.<sup>18</sup> Personalized, simulation-based education paired with faculty debriefing has been found to significantly increase the likelihood of students speaking up in response to both serious and

**Table 1.** Overview of included studies

| Study (Author, Year)                   | Training level | Whistleblowing content                                                      | Embedded or explicit | Key findings                                                                                     |
|----------------------------------------|----------------|-----------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------------|
| Nolan and Owen, 2023 <sup>10</sup>     | UG/PG          | 12 tips for fostering recognition and reporting of unprofessional behaviour | Explicit             | Provided practical strategies to embed in curricula; emphasized institutional support.           |
| Taylor and Goodwin, 2022 <sup>15</sup> | UG             | Organizational failure framing in ethics education                          | Embedded             | Argued for shifting from individual to systemic responsibility in whistleblowing education.      |
| Ryder et al, 2019 <sup>17</sup>        | UG             | Error identification and reporting curriculum                               | Explicit             | Simulation-based training improved willingness to report medical errors.                         |
| Goldie et al, 2003 <sup>18</sup>       | UG             | Longitudinal survey on whistleblowing attitudes                             | Embedded             | Limited improvement in willingness to whistleblow across years of training.                      |
| Bolsin et al, 2005 <sup>19</sup>       | UG/PG          | Virtue ethics and portable digital tech                                     | Embedded             | Proposed tools to promote moral responsibility and facilitate reporting.                         |
| Pohjanoksa et al, 2019a <sup>20</sup>  | UG/PG          | Whistleblowing process from suspicion to action                             | Embedded             | Described stages of whistleblowing; stressed the need for educational support structures.        |
| Pohjanoksa et al, 2019b <sup>21</sup>  | UG/PG          | Wrongdoing typology and whistleblowing responses                            | Embedded             | Identified common types of wrongdoing and contextual factors influencing reporting.              |
| Wiisak et al, 2022 <sup>22</sup>       | UG/PG          | Moral courage in whistleblowing                                             | Explicit             | Highlighted moral courage as a key competency; provided a conceptual model.                      |
| Wiisak et al, 2023 <sup>24</sup>       | UG/PG          | Ethical reasoning for whistleblowing                                        | Explicit             | Explored justifications for whistleblowing decisions in healthcare.                              |
| Chen et al, 2023 <sup>25</sup>         | UG             | Personalized simulation training                                            | Explicit             | Increased speaking-up behaviour in simulated error scenarios.                                    |
| Rennie and Crosby, 2002 <sup>26</sup>  | UG             | Student perceptions of whistleblowing                                       | Embedded             | Identified barriers including fear, lack of clarity, and perceived ineffectiveness of reporting. |
| Schwappach et al, 2019 <sup>27</sup>   | UG             | Speaking-up culture study                                                   | Embedded             | Found low encouragement from faculty; emphasized the need for role modelling.                    |
| Kohn et al., 2017 <sup>28</sup>        | UG             | Student-derived solutions to reporting barriers                             | Embedded             | Proposed anonymous reporting, delayed submission, and follow-up feedback systems.                |

non-critical medical errors.<sup>25</sup> Student-identified barriers, such as fear of retaliation and ambiguity around who is responsible for reporting, underscore the need for clear procedures and motivating factors within medical school environments.<sup>26</sup>

### ***Learner Attitudes and Preparedness***

Medical students frequently report uncertainty about when and how to raise concerns, and often face internal and external barriers that deter whistleblowing. Major deterrents include fear of retaliation, reputational damage, and skepticism about whether reporting leads to meaningful change.<sup>1</sup> Personalized debriefing and simulation education have been shown to improve willingness to speak up in both low- and high-stakes clinical scenarios.<sup>25</sup> Institutional culture plays a significant role; one study found students felt little encouragement from peers or supervisors to raise concerns, suggesting a need for greater psychological safety and more visible role modelling.<sup>27</sup> In response to these barriers, students have recommended solutions such as anonymous reporting systems, control over report timing, and consistent follow-up to encourage trust in reporting mechanisms.<sup>28</sup> Curricula that frame whistleblowing as both an individual responsibility and a systemic issue, rather than solely a personal moral challenge, may further support student preparedness.<sup>15</sup>

### ***Institutional and Cultural Contexts***

The hidden curriculum was frequently cited as undermining formal ethics instruction by reinforcing norms of silence, deference, or complicity. Several studies argue that whistleblowing education must be contextualized within broader organizational cultures, rather than placing the burden solely on individuals.<sup>15</sup> Building institutional cultures that support ethical action and embed reporting mechanisms into daily clinical practice has been proposed as a key strategy.<sup>10</sup> The use of virtue ethics and portable digital technologies has been identified as a means of promoting personal responsibility while reducing fear and isolation.<sup>19</sup> However, student attitudes toward speaking up often remain unchanged throughout education, suggesting that educational reform must go beyond individual skill-building to address broader environmental factors.<sup>18</sup> A systematic review has recommended that institutions empower, protect, support, and reward whistleblowers as part of cultivating a transparent and accountable culture.<sup>29</sup> Moral courage—defined as the willingness to act in accordance with ethical values despite personal risk—was also identified as a foundational component, with conceptual models developed to guide institutional leaders in supporting ethical action.<sup>22</sup>

### ***Virtue Ethics and Empowerment***

Emerging literature emphasizes the role of virtue ethics,

psychological safety, and digital tools in creating an environment where students feel empowered to speak up. Embedding virtue ethics into education can enhance moral character, reduce moral distress, and cultivate professional resilience, as demonstrated by a four-step ethics model for healthcare education.<sup>30</sup> Digital technologies, including apps and reflective tools, have also been proposed to encourage self-reporting and moral development.<sup>19</sup> Nevertheless, even with these tools, students frequently report a lack of faculty encouragement or institutional reinforcement, which limits their confidence to act.<sup>27</sup> Recent studies show that interactive, immersive digital interventions can improve ethical decision-making and prosocial behaviour, supporting their inclusion in whistleblowing curricula.<sup>31</sup> These findings collectively highlight the potential of combining virtue-based education with technological innovation and institutional support to empower ethical action in future physicians.

### ***Discussion***

This scoping review identified 13 peer-reviewed studies examining how whistleblowing is addressed in medical education. Four thematic domains emerged: educational strategies, learner attitudes and preparedness, institutional and cultural contexts, and virtue ethics and empowerment. While some medical schools have begun to incorporate whistleblowing content into professionalism, ethics, or patient safety education, formal and comprehensive approaches remain limited. Across studies, learners consistently expressed ethical tension, fear of retribution, and confusion about how or when to report concerns. These findings reflect ongoing gaps in both curricular content and institutional support systems that shape the way future physicians approach speaking up.

Current educational strategies addressing whistleblowing often rely on implicit messaging or are embedded within broader discussions of ethics and professionalism. Though this may increase general awareness, it is insufficient to address the complex situational and cultural barriers that learners face. Explicit interventions—such as simulation-based education, faculty-led debriefing, and structured curricula—have shown promise in improving students' likelihood of reporting concerns.<sup>25</sup> However, few programs provide clear guidance on institutional reporting mechanisms or clarify learners' responsibilities in escalating concerns.<sup>8,26</sup> Furthermore, educational models that overemphasize individual moral responsibility without addressing systemic contributors risk misplacing the burden of accountability.<sup>15</sup>

A critical finding across the literature was the pervasive impact of institutional culture on learners' willingness and ability to whistleblow. Hidden curricula, characterized by silence, fear of retaliation, or normalized complicity, can erode formal teaching on ethics and professionalism.<sup>18,27</sup> Institutions that foster environments of psychological safety and transparent reporting processes are more likely

to support student engagement in ethical action.<sup>10</sup> System-level interventions—including role modelling by faculty, policies that reward ethical courage, and meaningful feedback loops—were consistently identified as essential for creating sustainable cultural change.<sup>22,29</sup>

Finally, the integration of virtue ethics and emerging digital technologies offers a novel avenue for enhancing whistleblowing preparedness. Educational frameworks that cultivate moral character and ethical courage, particularly when coupled with reflective tools and immersive digital learning, can support students in navigating ethically complex situations.<sup>30,31</sup> However, the impact of these tools depends on their integration into a broader institutional commitment to empowerment and ethics. Without visible support from faculty and leadership, even the most well-designed tools and curricula may fail to translate into behavioural change.<sup>27</sup>

This study had several limitations. This review was limited to English-language studies published since 2000, which may have excluded relevant work in other languages or from earlier decades. Additionally, the small number of included studies (n = 13) reflects the relatively underdeveloped state of whistleblowing education literature. Many included studies were descriptive or exploratory, with limited evaluation of intervention outcomes or long-term impacts. Future research should focus on developing standardized, evidence-based curricula that explicitly address whistleblowing and speaking up. Longitudinal studies are needed to assess the impact of educational interventions on actual reporting behaviour and ethical decision-making during clinical practice. Moreover, greater attention should be paid to how power dynamics, equity, and intersectional factors influence learners' experiences with reporting concerns.

## Conclusion

Whistleblowing remains an essential yet underdeveloped component of medical education. Although growing awareness has prompted some integration into ethics and patient safety curricula, learners continue to face barriers rooted in fear, institutional culture, and limited structural support. Moving forward, medical educators must adopt a multifaceted approach that combines explicit education, ethical empowerment, digital innovation, and institutional reform to prepare future physicians to act with integrity and courage in the face of wrongdoing.

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## Authors' Contribution

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## Competing Interests

The authors declare no competing interest.

## Ethical Approval

As this was a review of published and publicly available literature, formal ethics approval was not required.

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## Supplementary File

Supplementary file. Full Search Strategy

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