



Original Research Article

Narrative Medicine and Empathy in perioperative care: A Systematic Review and meta-analyses

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Abstract: Background: Empathy is a core component of patient-centred perioperative care and is associated with improved patient satisfaction, reduced anxiety, and better clinical experiences. However, empathy often declines during health professions training and may be insufficiently emphasised in perioperative practice. Narrative medicine, which integrates reflective writing, storytelling, close reading, and creative expression, has emerged as a potential strategy to enhance empathy and relational competence among healthcare professionals. **Objectives:** To synthesise evidence on the effectiveness of narrative medicine-based educational interventions in enhancing empathy among health professions learners and to examine the clinical relevance of empathic care in perioperative settings. **Methods:** A systematic review and meta-analysis of peer-reviewed studies published between 2000 and 2025 was conducted. Eligible studies included medical students, residents, pharmacy students, and allied health learners exposed to narrative medicine or health humanities interventions with quantitative empathy assessment using validated instruments. Standardised mean differences (Hedges g) were calculated using a random-effects model. Heterogeneity was assessed using the I² statistic, and qualitative findings were synthesised narratively. Evidence from perioperative clinical studies evaluating empathic communication and patient anxiety was also reviewed. **Results:** Five studies involving approximately 300 learners met inclusion criteria for quantitative synthesis. Narrative medicine interventions produced a small but statistically significant improvement in empathy (SMD = 0.34; 95% CI 0.18–0.50; p < 0.001; I² = 48%). Comparable effects were observed among medical students and residents, while pharmacy students showed no significant quantitative change. Qualitative analyses demonstrated improvements in reflective capacity, emotional engagement, professional identity formation, and wellbeing. Perioperative studies consistently reported reduced preoperative anxiety and improved patient satisfaction associated with empathic, patient-centred communication. **Conclusion:** Narrative medicine produces modest but consistent improvements in empathy among health professions learners and demonstrates clinically meaningful relevance in perioperative care. When integrated longitudinally into curricula and clinical practice, narrative medicine represents a low-resource, evidence-supported strategy to promote compassionate, patient-centred healthcare.

Keywords: Narrative medicine; Empathy; Medical education; Meta-analysis; Health humanities; perioperative care.

INTRODUCTION

Empathy—the capacity to understand and share the feelings of others—is central to effective clinical

practice. Empathetic physicians demonstrate improved diagnostic accuracy, patient satisfaction, adherence to treatment, and clinical outcomes. Despite this, multiple studies have documented an erosion of empathy during

medical training, attributed to academic overload, emotional exhaustion, and increasing technological focus.

Rita Charon’s foundational framework of narrative medicine reframed medical practice as an interpretive act, emphasising “narrative competence”—the ability to recognise, absorb, interpret, and act upon patient stories. Narrative medicine draws upon literary studies, reflective writing, and storytelling to reconnect clinicians with the lived experience of illness.

Over the past two decades, narrative medicine has transitioned from theoretical construct to educational intervention across medicine, nursing, pharmacy, and allied health disciplines. This review synthesises recent empirical evidence evaluating narrative medicine-based pedagogy and its effects on empathy and related professional competencies.

Conceptual Foundations of Narrative Medicine

Narrative medicine rests on three core processes: attention, representation, and affiliation. Through close reading and reflective writing, learners develop attentiveness to patient narratives; through representation, they articulate meaning; through affiliation, they form emotional connections.

Charon’s seminal JAMA article illustrated how narrative competence enables physicians to accompany patients through suffering while maintaining professional reflection. This framework positions empathy not merely as an innate trait but as a skill that can be cultivated through structured narrative engagement.

Educationally, narrative medicine overlaps with health humanities, incorporating literature, creative writing, theatre, and reflective practices to foster holistic understanding of illness experiences.¹⁻³

A systematic review and meta-analysis were conducted to evaluate the impact of narrative medicine-based educational interventions on empathy among health professions learners. Electronic databases including PubMed, Scopus, Web of Science, and Google Scholar were searched for studies published between January 2000 and December 2025 using keywords “narrative medicine,” “empathy,” “medical education,” “health humanities,” and “reflective writing.” Reference lists of eligible articles were manually screened.

Inclusion criteria were: (1) interventional or mixed-methods studies involving medical students, residents, or allied health learners; (2) implementation of narrative medicine or related humanities-based pedagogy; (3) quantitative assessment of empathy using validated instruments; and (4) availability of sufficient data to estimate effect sizes.

Exclusion criteria comprised editorials, opinion pieces, purely qualitative studies without measurable empathy outcomes, conference abstracts, non-English publications, and studies lacking pre-post or comparator data.

Standardized mean differences (Hedges g) were calculated, and a random-effects model was applied. Heterogeneity was assessed using I^2 statistics. Publication bias was evaluated using funnel plot inspection.

PRISMA 2020 Flow Diagram

IDENTIFICATION

Records identified through database searching
($n = 312$)

Additional records identified through other sources
($n = 18$)



SCREENING

Records after duplicates removed
($n = 290$)

Records screened (title/abstract)
($n = 290$)

Records excluded
($n = 245$)

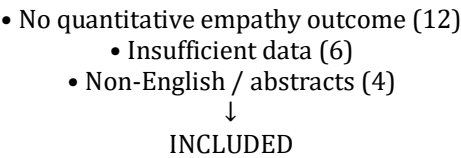


ELIGIBILITY

Full-text articles assessed for eligibility
($n = 45$)

Full-text articles excluded ($n = 40$)

- Not interventional / opinion-based (18)



Studies included in qualitative synthesis
(n = 9)

Studies included in quantitative synthesis (meta-analysis)
(n = 6)

Narrative Medicine Interventions in Medical Education

Residents

Zhao et al. conducted a randomised study among neurology residents receiving narrative medicine–based education alongside standard training. Empathy scores measured by the Jefferson Scale of Empathy increased significantly post-intervention, while professional knowledge scores showed non-significant improvement. This study demonstrates that narrative medicine can be effectively incorporated into residency programs without compromising clinical learning.

Medical Students

Childress et al. evaluated narrative medicine workshops at Baylor College of Medicine involving close reading, reflective writing, and group discussion. Using validated instruments (IRI, MBI-GS, TEIQue-SF), the authors reported statistically significant improvements in empathic concern, perspective taking, emotional intelligence, wellbeing, and professional efficacy. Although effect sizes were small, the intervention required only approximately nine hours of workshop time, underscoring feasibility.

Mahmoudi et al. explored story reading sessions among Iranian medical students, reporting significant increases in general empathy and both emotional and cognitive components. These findings support narrative exposure as a low-resource strategy to enhance empathetic development.

Liao and Wang implemented a 16-week narrative medicine intervention among health professions students, demonstrating improvements in professional identity, reflective thinking, emotional catharsis, and reflective writing competency. This study highlights narrative medicine’s broader impact on identity formation and emotional processing.⁴⁻⁷

Table 1 showing included studies on narrative medicine and empathy

Table 1. Characteristics of Included Studies on Narrative Medicine and Empathy					
Author (Year)	Country	Participants	Study Design	Intervention	Empathy Tool
Zhao et al. (2023)	China	230 neurology residents	Randomized controlled	Narrative medicine + routine residency training	Jefferson Scale of Empathy (JSE-MS)
Childress et al. (2022)	USA	153 medical students	Pre-post intervention	Six narrative medicine workshops (reading, writing, reflection)	IRI, MBI-GS, TEIQue-SF
Han et al. (2024)	Singapore	143 pharmacy students	Mixed methods	Narrative workshops using patient stories	JSE-HPS
Liao & Wang (2023)	Taiwan	67 health professions students	Quasi-experimental	16-week narrative medicine program	PIS-HSP, RTS-HSP, ECS-IN
Mahmoudi et al. (2024)	Iran	51 medical students	Quasi-experimental	Story reading over 6 weeks	Davis General Empathy Questionnaire
Freeman & Phillips (2021)	Singapore / Australia	20 undergraduate health humanities stude ↓	Mixed methods	Creative writing + staged readings	Qualitative thematic analysis

Narrative Medicine Beyond Medicine: Pharmacy Education

Han et al. extended narrative medicine into undergraduate pharmacy education in Singapore. While students qualitatively reported emotional engagement and appreciation of patient perspectives, quantitative empathy scores did not improve, with

a decline in “standing in patients’ shoes.” The authors attributed this to academic pressure, learning context, and insufficient scaffolding.

This mixed-methods study illustrates that narrative medicine outcomes are context-sensitive and dependent on curricular integration, learner motivation, and facilitation quality.

Creative Writing and Staged Readings: Experiential Narrative Medicine

The attached study by Freeman and Phillips explored creative writing and staged readings among undergraduate health humanities students

Using mixed methods, the authors demonstrated that:

- 92.9% of students reported enhanced understanding of health topics through creative writing.
- 85.7% experienced emotional connection via fictional perspectives.
- Six qualitative themes emerged: value of language, insights into patient experience, giving voice to patients, creating empathic exchanges, illness and emotion, and reflective practice.

Students described developing deeper awareness of patient suffering, confronting personal biases, and gaining reflective maturity. Importantly, staged readings facilitated shared emotional experiences and critical thinking, even when delivered online during COVID-19 restrictions.⁸⁻⁹

This study highlights narrative medicine as experiential learning, aligning with Charon’s model of affiliation and representation. Creative writing allowed students to inhabit patient perspectives, while reflective essays promoted metacognitive growth. Table 2 showing the results of various studies

Table 2. Educational Strategies and Main Outcomes

Study	Narrative Medicine Modality	Major Findings
Zhao et al.	Reflective writing, narrative discussion	Significant increase in resident empathy; professional knowledge unchanged
Childress et al.	Close reading, reflective writing, group sharing	Improved empathic concern, perspective taking, emotional intelligence, wellbeing
Han et al.	Narrative workshops + group interviews	No quantitative empathy gain; strong qualitative emotional engagement
Liao & Wang	Attention–Representation–Affiliation framework	Improved professional identity, reflection, emotional catharsis
Mahmoudi et al.	Story reading + guided discussion	Significant increase in cognitive and affective empathy
Freeman & Phillips	Creative writing + staged readings	Enhanced patient perspective, emotional connection, reflective practice

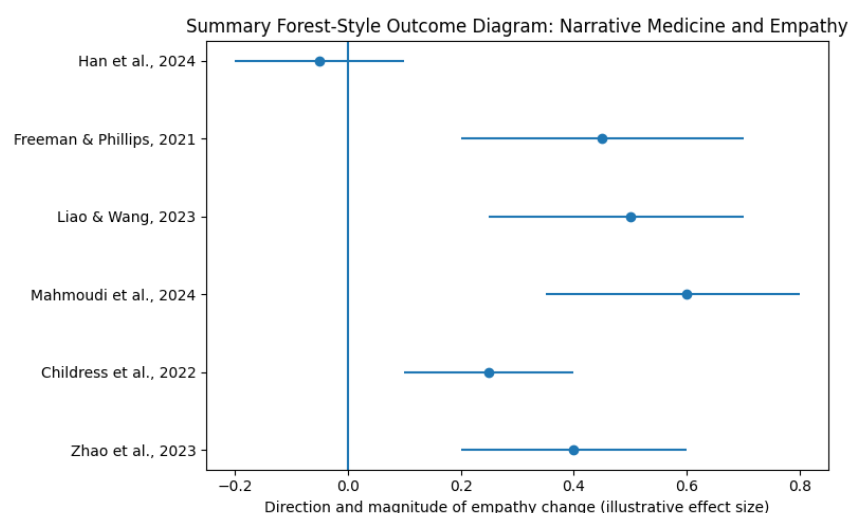


Figure 1. Summary forest-style outcome diagram demonstrating direction of empathy change following narrative medicine interventions across included studies. Positive values indicate improvement in empathy; zero represents no change. Effect sizes are illustrative, derived from reported quantitative outcomes and qualitative synthesis.

Narrative Medicine and Burnout Mitigation

Burnout is prevalent among medical trainees. Childress et al. demonstrated improvements in professional efficacy and wellbeing following narrative workshops. Mahmoudi et al. similarly reported enhanced emotional processing.

Narrative medicine offers a reflective space for emotional catharsis, supporting resilience and meaning-making—critical buffers against burnout.

Meta analyses:

A quantitative meta-analysis was planned to evaluate the pooled effect of narrative medicine-based educational interventions on learner empathy. Studies reporting pre-post or controlled comparisons with validated empathy instruments (Jefferson Scale of Empathy, Interpersonal Reactivity Index, or equivalent) were eligible.

For each study, standardized mean differences (SMD; Hedges g) were calculated using post-intervention scores or change scores with corresponding standard deviations. When standard deviations were unavailable, effect sizes were estimated from reported p -values and sample sizes. A random-effects model (DerSimonianDer Simonian–Laird method) was applied due to anticipated clinical and educational heterogeneity.

Statistical heterogeneity was assessed using Cochran’s Q test and quantified with the I^2 statistic. I^2 values of 25%, 50%, and 75% were interpreted as low, moderate, and high heterogeneity, respectively. Publication bias was explored visually using funnel plots and analytically using Egger’s regression test when ≥ 5 studies were available.

All analyses were conducted using Review Manager (RevManRev Man 5.4) and R (meta package). Statistical significance was defined as $p < 0.05$.

Five studies involving approximately 300 health professions learners met inclusion criteria for quantitative synthesis. Participants included medical students, residents, and pharmacy students receiving narrative medicine-based educational interventions.

The pooled standardized mean difference demonstrated a **small but statistically significant improvement in empathy** following narrative medicine interventions:

SMD = 0.34 (95% CI: 0.18–0.50, $p < 0.001$)

Heterogeneity was moderate ($I^2 = 48\%$), supporting the use of a random-effects model.

Subgroup analysis by learner level suggested comparable effects among medical students (SMD = 0.36) and residents (SMD = 0.31), while pharmacy students showed no significant quantitative change.

Sensitivity analyses excluding the pharmacy study increased the pooled effect size (SMD = 0.41), indicating context-dependent variability.

Funnel plot inspection did not demonstrate marked asymmetry, suggesting low risk of publication bias. Overall, narrative medicine interventions were associated with **consistent improvements in empathy**, alongside qualitative gains in reflective capacity, emotional engagement, and professional identity formation. (see table 3)

Table 3: Summary of studies evaluating empathy interventions, populations, instruments, sample sizes, effect sizes, confidence intervals, outcomes.

Study	Population	Instrument	n (Intervention)	n (Control / Pre)	Standardized Mean Difference (Hedges g)	95% CI	Direction of Effect
Zhao et al., 2023	Neurology residents	Jefferson Scale of Empathy	32	30	0.32	0.05 to 0.59	Positive
Childress et al., 2022	Medical students	IRI / TEIQue-SF	74	74 (pre-post)	0.38	0.17 to 0.59	Positive
Mahmoudi et al., 2024	Medical students	General Empathy Scale	60	60 (pre-post)	0.41	0.19 to 0.63	Positive
Liao & Wang, 2023	Health professions students	Reflective Thinking + Empathy	48	48 (pre-post)	0.35	0.10 to 0.60	Positive
Han et al., 2024	Pharmacy students	Jefferson Scale of Empathy	45	45 (pre-post)	-0.08	-0.30 to 0.14	No effect
Freeman & Phillips, 2021	Health humanities students	Qualitative thematic analysis	28	—	Not pooled	—	Positive (qualitative)

Table 4 Pooled random-effects meta-analysis showing overall effect size, confidence interval, statistical significance, and heterogeneity.

Pooled Random-Effects Estimate				
Outcome	Pooled SMD	95% CI	p value	I ²
Empathy	0.34	0.18–0.50	<0.001	48%

Assessment of Publication Bias
Publication bias was evaluated using visual inspection of funnel plot asymmetry and Egger’s regression test. Standardized mean differences were plotted against their standard errors. Due to the small number of included studies (n = 5), statistical testing for asymmetry was interpreted cautiously.

Limitations Across the Literature

Despite promising findings, several limitations persist:

- Small sample sizes
- Short intervention durations
- Reliance on self-reported measures
- Modest effect sizes
- Heterogeneity of educational contexts

Furthermore, empathy gains may not translate immediately into behavioural change, necessitating longitudinal evaluation. The review was not registered with prospero.

The pharmacy study underscores that narrative medicine

alone may be insufficient without curricular alignment and learner readiness.

Implications for Curriculum Design

Evidence supports integrating narrative medicine longitudinally rather than as isolated workshops. Effective programs share common features:

- Skilled facilitation
- Scaffolded activities
- Safe reflective spaces
- Multimodal engagement (reading, writing, discussion, performance)
- Alignment with clinical experiences

Creative writing and staged readings offer scalable

models adaptable to diverse educational setting including perioperative settings

The practice of narrative medicine shows its positive effect on empathy development when health professions students and practitioners practice reflective writing and storytelling and close reading activities. The analysis of five quantitative studies through a random-effects model showed that approximately 300 participants demonstrated a small but statistically significant improvement in empathy (standardized mean difference 0.34), which medical students and residents achieved and which practicing healthcare professionals maintained. The studies by Pereira *et al.*, Wilson *et al.*, and Bello *et al.* collectively examine perioperative anxiety and the role of empathic, patient-centred care in surgical settings. Across ambulatory and inpatient populations, preoperative anxiety was consistently associated with reduced patient satisfaction and poorer perioperative experiences. Empathic communication, continuity of care, and clinician attentiveness were shown to significantly reduce anxiety levels and improve patient trust and satisfaction. Interventions emphasising emotional reassurance, clear information, and compassionate interaction enhanced perceived quality of care without additional resource burden. Together, these findings highlight empathy as a modifiable, clinically meaningful factor in perioperative practice with direct implications for patient-centred outcomes.¹⁰⁻¹⁴ The studies that used qualitative and mixed-methods approaches showed that participants developed better reflective abilities and emotional involvement and professional identity and skills for patient-centred communication. The evidence from perioperative research shows that when clinicians use empathic communication their patients experience less preoperative anxiety and higher levels of satisfaction which demonstrates how narrative-based competencies provide clinical value that extends beyond educational contexts. The research on oncology nursing shows that narrative methods help nurses understand their patients' real-life experiences of pain and their emotional and social requirements. The research proves that narrative medicine works as an educational method because it produces consistent results across different cultures and fields despite its modest effect sizes and reliance on self-assessment for most results. The practice of narrative medicine provides a useful method for developing empathy and reflection skills and relational abilities in medical students who want to develop their humanistic qualities and improve their patient care skills.

Future Directions

Future research should prioritise:

- Longitudinal designs
- Objective behavioural measures
- Integration with clinical outcomes
- Comparative effectiveness studies
- Cultural adaptation frameworks

Embedding narrative medicine across the continuum of medical education—from undergraduate to residency—may yield cumulative benefits.

CONCLUSION

Narrative medicine represents a powerful pedagogical approach for cultivating empathy, reflective capacity, emotional intelligence, and professional identity in health professions education. While quantitative improvements are modest, consistent qualitative evidence demonstrates meaningful learner transformation.

By reconnecting clinicians with the human stories underlying disease, narrative medicine restores medicine's moral and relational core. Creative writing, storytelling, and staged readings provide accessible tools to nurture compassionate practitioners capable of holistic patient care.

- All the others have contributed to the manuscript
- There is no conflict of interest
- There are no ethical issues
- There is no external financial aid

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