International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Available online on: https://ijmpr.in/

Review Article

Communication Skills Education and Patient-Centered Outcomes in Medical Students: A Systematic Review

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OPEN ACCESS

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Received: 21-06-2026
Accepted: 10-07-2026
Available online: 25-07-2026

ABSTRACT

Background: Patient-centered communication requires medical students to combine accurate clinical information gathering with empathy, attentive listening, understandable explanations, recognition of patient preferences, and collaborative decision-making. Communication education is widely incorporated into undergraduate medical curricula, but teaching approaches and measured outcomes remain heterogeneous.

Objective: To examine the effects of communication skills education on patient-centered outcomes among undergraduate medical students and identify educational components associated with improvement in observable clinical communication.

Methods: PubMed/MEDLINE, Embase, Scopus, Web of Science, ERIC, and the Cochrane Central Register of Controlled Trials were searched for studies published from January 2000 to June 2026. Randomized trials and comparative educational studies involving undergraduate medical students were eligible when they evaluated a structured communication intervention and reported an objectively assessed or patient-reported outcome related to patient-centered care. Outcomes were grouped into global patient-centered communication, empathy and emotional responsiveness, health-literacy communication, patient agenda elicitation, shared decision-making, delivery of difficult information, rapport, and patient satisfaction. Risk of bias was assessed using principles from RoB 2 and ROBINS-I. Owing to substantial clinical and methodological heterogeneity, a structured narrative synthesis was undertaken.

Results: The search identified 4,443 records. After removal of 1,287 duplicates, 3,156 records were screened and 267 full-text reports were assessed. Fifteen studies were included. Twelve used randomized designs and three used controlled comparative designs. Eleven of 13 studies assessing global patient-centered communication reported improvement. Eight of 11 studies assessing empathy or emotional responsiveness reported positive effects. Improvement was also observed in health-literacy communication in six of seven studies, shared decision-making or informed consent in five of six, and delivery of difficult information in four of five. Programs combining active practice, direct observation, feedback, and reflection produced more consistent effects than passive teaching. Evidence for retention beyond six months and transfer to routine patient care was limited.

Conclusion: Communication skills education improves several patient-centered competencies among medical students, particularly when learners practise authentic consultations and receive structured feedback. Curricula should move beyond isolated workshops and provide longitudinal, progressively complex communication education linked to clinical placements. Future research should prioritize patient-reported outcomes, workplace transfer, and long-term retention.

Keywords*: medical students; communication education; patient-centered care; empathy; simulation; health literacy; shared decision-making; systematic review.*

INTRODUCTION

Communication is a clinical intervention as well as a means of exchanging information. The quality of communication influences the accuracy of history taking, recognition of patient concerns, understanding of treatment options, participation in decisions, adherence, trust, and satisfaction. Patient-centered communication links biomedical assessment with the patient's personal experience of illness, expectations, values, emotional state, social circumstances, and preferred role in decision-making [1–4].

Patient-centered care is not limited to politeness or compassion. It requires specific and observable behaviours, including inviting the patient's narrative, using open questions, avoiding premature interruption, exploring ideas and concerns, identifying emotional cues, responding empathically, explaining information in accessible language, checking understanding, discussing alternatives, and reaching a mutually acceptable plan [5–7].

Medical students frequently experience tension between biomedical task completion and relationship-centered care. Early learners may concentrate on remembering a sequence of history-taking questions, whereas clinical students may focus on differential diagnosis, examinations, documentation, and time management. In both situations, the patient's agenda can become secondary unless communication is deliberately taught, modelled, practised, and assessed.

Communication competence was historically regarded as a personal attribute acquired through clinical exposure. Contemporary medical education recognizes that communication comprises teachable behaviours requiring deliberate practice. Structured methods include standardized patients, peer role-play, simulated consultations, video review, patient narratives, motivational interviewing, digital patients, reflective writing, improvisational theatre, and supervised encounters with real patients [8–12].

Educational methods are likely to influence the outcomes achieved. Lectures can improve conceptual knowledge but may have limited effects on real-time performance. Standardized-patient encounters allow students to integrate verbal and non-verbal communication in a controlled clinical situation. Peer role-play provides repeated low-cost practice and encourages perspective-taking. Video feedback can reveal interruptions, avoidance of eye contact, excessive jargon, defensive posture, or missed emotional cues. Digital platforms can increase scalability and provide immediate or automated feedback.

Educational outcomes also differ in their proximity to patient care. Knowledge and confidence are relatively easy to measure but do not necessarily represent competent clinical behaviour. Objective structured clinical examinations assess demonstrated performance under controlled conditions. Standardized-patient ratings offer a simulated patient perspective, whereas evaluations from actual patients provide greater authenticity but are more difficult to standardize. Long-term patient-centered outcomes require evidence that learned behaviours transfer from the classroom to clinical placements and later practice.

Previous reviews have reported positive but heterogeneous effects of communication training. The Cochrane review by Gilligan et al. concluded that educational interventions may improve overall interpersonal communication and empathy, but certainty was limited by variation in interventions, instruments, comparators, and study quality [13]. Reviews of empathy, simulated patients, and digital communication education have reached similar conclusions while highlighting the need for long-term and patient-derived outcomes [14–16].

The present review focuses specifically on outcomes that reflect patient-centered care. It examines whether communication education changes how medical students identify patient needs, respond to emotions, explain information, support autonomy, and establish collaborative relationships. The primary objective was to evaluate the effect of structured communication skills education on patient-centered outcomes among undergraduate medical students. Secondary objectives were to compare educational formats, examine the contribution of feedback and patient participation, evaluate persistence of benefit, and identify limitations in the evidence base.

METHODS

Review Design

The review was designed and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 statement [17]. The protocol was not prospectively registered.

Review Question

Among undergraduate medical students, how does structured communication skills education affect objectively assessed or patient-reported patient-centered outcomes compared with routine education, no additional training, or an alternative teaching method?

Eligibility Criteria
Studies were eligible when participants were enrolled in an undergraduate-entry or graduate-entry medical degree leading to primary medical qualification. Studies involving residents, postgraduate trainees, or other health-profession learners were excluded unless results for medical students were reported separately.

Eligible interventions were educational programs intended to improve communication between medical students and patients or family members. Interventions included standardized or simulated patients, peer role-play, workshops, video demonstration or feedback, patient narratives, health-literacy education, empathy training, motivational interviewing, breaking-bad-news education, informed-consent simulation, virtual patients, telehealth simulation, improvisational theatre, guided reflection, and longitudinal communication curricula.

Acceptable comparators included routine curriculum, lecture-based education, delayed training, no intervention, historical controls, or an alternative educational intervention.

The primary outcome was objectively assessed patient-centered communication. Eligible domains included global patient-centered consultation performance, elicitation of the patient's agenda, exploration of ideas and concerns, empathy, emotional responsiveness, rapport, understandable explanation, plain language, teach-back, shared decision-making, informed consent, motivational interviewing, delivery of difficult information, and patient or standardized-patient satisfaction.

Randomized controlled trials, cluster-randomized trials, randomized crossover trials, non-randomized controlled studies, and comparative before-and-after studies were eligible. Uncontrolled descriptive studies, qualitative studies without evaluative outcomes, protocols, editorials, and conference abstracts lacking sufficient information were excluded.

Information Sources and Search Strategy
PubMed/MEDLINE, Embase, Scopus, Web of Science Core Collection, ERIC, and the Cochrane Central Register of Controlled Trials were searched. Google Scholar and reference lists of relevant reviews and eligible publications were used for supplementary citation searching.

The search covered January 1, 2000, to June 30, 2026. Search terms combined concepts related to medical students, communication education, patient-centered communication, empathy, simulation, health literacy, patient experience, and shared decision-making. A representative PubMed strategy was: ("Students, Medical" OR medical student* OR undergraduate medical education) AND ("Communication" OR communication skill* OR doctor-patient communication OR patient-centered communication) AND (training OR education OR curriculum OR simulation OR standardized patient OR role-play OR feedback OR virtual patient) AND (empathy OR patient perspective OR shared decision-making OR health literacy OR patient satisfaction).

Study Selection
Two reviewers independently screened titles and abstracts. Reports considered potentially relevant by either reviewer underwent full-text evaluation. Full-text eligibility was assessed independently using predefined criteria, and disagreements were resolved through discussion. A third reviewer was consulted when consensus could not be reached. Reasons for full-text exclusion were recorded.

Data Extraction
A standardized extraction form captured the first author and year, country, academic level of participants, design, sample size, intervention format and duration, comparator, use of standardized or real patients, feedback source, assessment instrument, outcome domain, assessment timing, direction of effect, attrition, and funding information. One reviewer extracted data and a second reviewer verified the entries against the primary report.

Risk-of-Bias Assessment
Randomized studies were assessed using domains consistent with the Cochrane Risk of Bias 2 tool: randomization, deviations from intended interventions, missing outcome data, outcome measurement, and selection of reported results. Non-randomized studies were assessed using ROBINS-I principles, including confounding, participant selection, intervention classification, missing data, and selective reporting.

Blinding of students and instructors was generally impossible in educational trials. Greater importance was therefore placed on allocation methods, baseline comparability, blinded performance assessment, validated instruments, attrition, and consistency of intervention delivery.

Data Synthesis and Certainty
Formal meta-analysis was not undertaken because interventions, comparators, outcome instruments, and assessment timings differed substantially. Outcomes were synthesized using a direction-of-effect approach and grouped into global

patient-centered communication, patient agenda and illness-experience exploration, empathy and emotional responsiveness, understandable explanation and health literacy, shared decision-making and informed consent, difficult-news communication, patient-rated rapport or satisfaction, and retention or clinical transfer.

Certainty was judged by considering risk of bias, consistency, directness, precision, and publication bias. Evidence was categorized as high, moderate, low, or very low.

Ethical Considerations

Ethics committee approval and individual consent were not required because the review analyzed previously published studies.

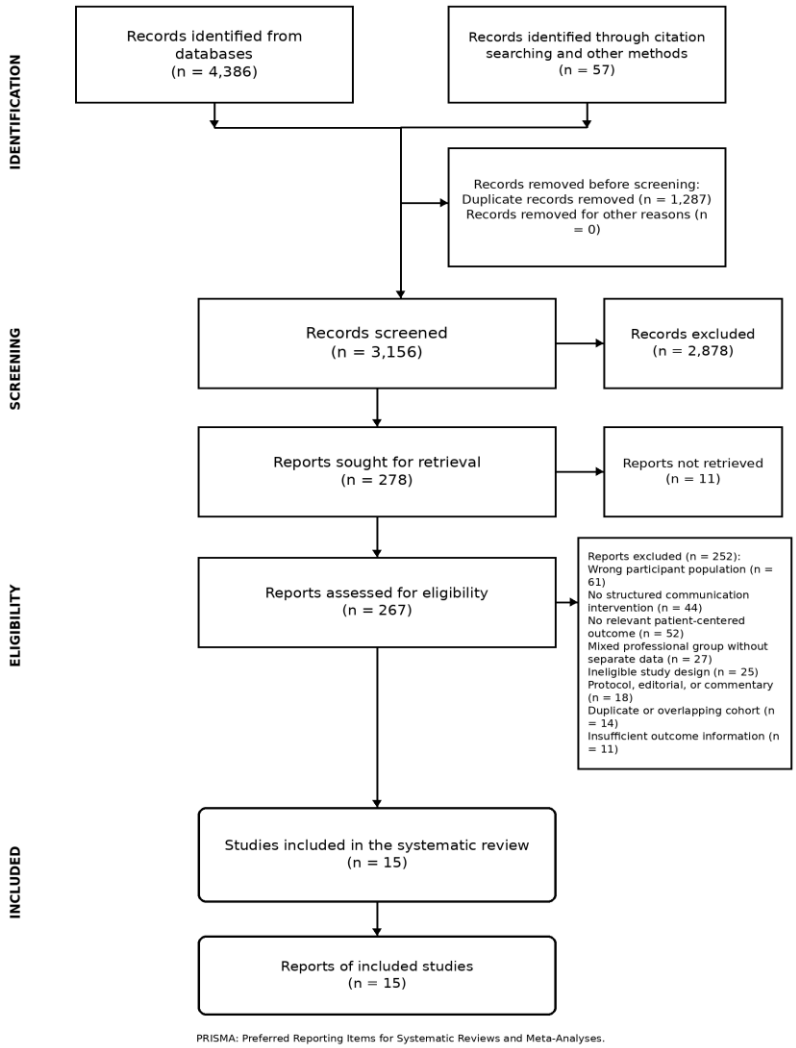
RESULTS

Study Selection

The database search identified 4,386 records and supplementary citation searching identified 57 additional records, producing 4,443 records. After removal of 1,287 duplicates, 3,156 titles and abstracts were screened. Of these, 2,878 were excluded.

Full reports were sought for 278 records. Eleven reports could not be retrieved, leaving 267 reports for full-text eligibility assessment. Two hundred and fifty-two reports were excluded: wrong participant population (n = 61), no structured communication intervention (n = 44), no relevant patient-centered outcome (n = 52), mixed professional group without separate medical-student data (n = 27), ineligible study design (n = 25), protocol, editorial, or commentary (n = 18), duplicate or overlapping cohort (n = 14), and insufficient outcome information (n = 11). Fifteen studies were included in the final synthesis.

Figure 1. PRISMA 2020 Flow Diagram of Study Selection



PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

Characteristics of Included Studies

The 15 included studies were published between 2015 and 2025 and were conducted in Europe, Asia, Australia, North America, and the Middle East. Twelve studies used randomized designs, including parallel-group, cluster-randomized, and crossover trials, whereas three used controlled comparative or prospective pre–post designs.

Intervention intensity ranged from a single digital or video-based session to multiple simulation encounters, repeated consultations, patient feedback, guided reflection, or longitudinal experiential teaching. Standardized or simulated patients were incorporated into 11 studies, and six studies used digital or technology-supported learning.

Table 1. Characteristics of included studies

Author, year	Country	Educational approach	Main domain	Assessment	Principal finding
Iqbal et al., 2015	India	Focused workshop with demonstrations and practice	Global consultation communication	Pre/post OSCE	Improved communication performance after focused training
Liu et al., 2016	Australia	EQClinic telehealth simulation with automated non-verbal and standardized-patient feedback	Verbal and non-verbal consultation skills	Blinded SOCA assessment	Communication scores improved after exposure to the platform
Gorniewicz et al., 2017	United States	Patient-story-based digital module for breaking bad news	Emotional responsiveness and difficult-news delivery	Standardized-patient OSCE	Improved response to emotions and breaking-bad-news behaviours
Wündrich et al., 2017	Germany	Empathy training with simulated patients	Empathic communication	Blinded simulated-patient and expert ratings	Improved observed empathic performance
Ruiz-Moral et al., 2017	Spain	Didactic, reflective, and simulated-patient encounters	Illness experience and emotional cues	External observer and simulated-patient ratings	More cues identified and more empathic expressions used
Schmitz et al., 2017	Switzerland	Video-based worked examples containing communication errors	Breaking bad news	Simulated-patient performance	Error-focused examples improved subsequent performance
Ahmadzadeh et al., 2019	Iran	Patient-physician film with or without communication workshop	Empathy	Jefferson Scale of Empathy	Workshop-supported cinemeducation produced greater short-term benefit
Servotte et al., 2019	Belgium	Short simulation-based role-play course	Breaking bad news and self-efficacy	Performance rating and self-efficacy scale	Improved confidence and several observed behaviours
Kaper et al., 2020	Netherlands	Comprehensive health-literacy consultation curriculum	Plain language, self-management, shared decisions	Simulated consultation and competency measures	Improved health-literacy-sensitive communication
Lai et al., 2020	Australia	Written patient-satisfaction feedback with guided reflection	Patient-centeredness and rapport	Patient and tutor ratings	Additional feedback improved tutor-rated patient-centeredness
Grossman et al., 2021	United States	Communication-focused improvisational theatre exercises	Listening, adaptability, and empathy	Standardized-patient assessment	Improved empathic communication and patient satisfaction
Vincent et al., 2022	France	E-learning assignment on breaking-bad-news techniques	Recognition of difficult-news communication	Knowledge and performance assessment	Improved recognition of effective communication techniques

Author, year	Country	Educational approach	Main domain	Assessment	Principal finding
Arranz et al., 2023	Spain	Multifaceted training to incorporate patient agendas	Patient agenda elicitation	Multisource simulated-encounter assessment	More consistent identification and integration of patient agendas
Sarkis et al., 2025	Brazil	Role-play and reflection compared with student-led presentation	Empathy and consultation behaviour	Patient, teacher, and observer assessments	Experiential role-play produced stronger behavioural improvement
McCarrick et al., 2025	Ireland	Simulation training for informed consent with tutor modelling and peer reenactment	Explanation, autonomy, and consent	OSCE communication scales	Improved consent communication compared with observational learning

Educational Format

Active participation was a common feature of effective programs. Thirteen studies required students to perform a consultation, assume a role, respond to a simulated patient, or apply communication principles to a clinical scenario. Direct performance feedback was provided in 10 studies, with feedback originating from standardized patients, real patients, faculty tutors, peers, video review, or automated analysis of non-verbal behaviour.

Passive instruction alone rarely produced broad improvement in patient-centered performance. Digital interventions were more successful when they required learner responses, incorporated authentic patient experiences, or were followed by simulation and feedback.

Global Patient-Centered Communication

Thirteen studies evaluated overall consultation performance or a composite patient-centered communication score, and 11 reported significant improvement. Positive changes were most often observed in opening the consultation, allowing patients to describe concerns, using open questions, maintaining a logical structure, demonstrating attentive non-verbal behaviour, acknowledging the patient's perspective, summarizing information, and involving the patient in planning.

The most persuasive findings were reported in studies using repeated observation and performance-based assessment. Interventions evaluated only through knowledge tests or confidence scales provided less consistent evidence of behavioural change.

Patient Agenda and Illness-Experience Exploration

Seven studies assessed whether students elicited patient concerns, expectations, emotional responses, priorities, or understanding of illness; six demonstrated positive findings. Programs that explicitly named patient-agenda exploration as a learning objective were more successful than general history-taking courses.

Students improved when prompted to ask what mattered most to the patient, what the patient believed was happening, and which concerns could influence the management plan. Ruiz-Moral et al. reported improvement in the recognition of contextual and emotional clues and the use of empathic responses during standardized encounters [22].

Empathy and Emotional Responsiveness

Eleven studies measured empathy or emotional responsiveness. Eight showed significant benefit, two reported mixed results, and one found no meaningful between-group difference. Observed empathy improved more consistently when interventions included simulated patients, role reversal, patient stories, or feedback about emotional cues.

Self-reported empathy did not always correspond with observed communication. This supports the use of standardized-patient and observer ratings alongside self-report instruments. Empathy teaching was most effective when it translated the concept into observable actions, including acknowledging emotion, validating concerns, exploring meaning, avoiding premature reassurance, and offering support.

Understandable Explanation and Health-Literacy Communication

Seven studies assessed explanation, plain language, checking understanding, or health-literacy-sensitive communication, and six reported improvement. Kaper et al. evaluated a comprehensive curriculum involving simulated consultations, self-management support, patient-centered communication, and shared decision-making [25].

Students frequently improved in reducing jargon and organizing explanations, but checking understanding was less consistently performed. Teach-back required explicit teaching and practice rather than general instructions to communicate clearly.

Shared Decision-Making and Informed Consent

Six studies included outcomes related to shared decision-making, patient participation, collaborative planning, or informed consent; five reported significant improvement. Effective interventions taught students to identify that a decision was required, describe options, explain benefits and harms, elicit preferences, check understanding, respond to uncertainty, and reach an agreed plan.

Generic communication teaching did not automatically improve every component. Students were often comfortable providing information but less consistent in asking how patients wished to participate or incorporating preferences into the final decision.

Delivery of Difficult Information

Five studies evaluated breaking-bad-news or emotionally difficult scenarios, and four showed improvement. Patient-story-based education improved attention to patient responses and acknowledgment of feelings, whereas error-focused video examples helped learners recognize ineffective behaviours [20,23].

Across the difficult-news studies, emotional acknowledgment improved more reliably than discussion of follow-up plans, uncertainty, and patient preferences. Communication frameworks should therefore address the complete consultation rather than focusing only on the moment of disclosure.

Patient Feedback, Rapport, and Satisfaction

Five studies included ratings from standardized patients, patient volunteers, or actual patients, and four reported improvement in at least one outcome. Patient feedback emphasized feeling listened to, receiving respectful treatment, obtaining understandable information, and experiencing an unhurried interaction.

Patient ratings were influenced by case characteristics and individual expectations, but they provided information not always captured by faculty assessments. They were most informative when combined with tutor observation and structured reflection.

Digital and Technology-Supported Education

Six studies evaluated digital or technology-supported learning. Automated non-verbal feedback helped students recognize gaze, posture, facial behaviour, and conversational balance. Virtual or telehealth simulations provided standardized exposure to situations that were difficult to arrange consistently with real patients.

Digital tools were most effective when they required active decisions, provided individualized feedback, included authentic patient experiences, were connected to an observed consultation, or allowed repeated practice. Digital education used only as a repository of information was less likely to change complex interpersonal behaviour.

Duration and Retention

Six studies included follow-up beyond the immediate post-intervention assessment. Three reported sustained improvement, two showed partial loss of benefit, and one found no significant longer-term difference. Repeated consultation practice and longitudinal feedback were associated with better retention than single-session interventions.

Few studies evaluated communication after students moved into a different specialty or began internship. Transfer across clinical settings therefore remained uncertain.

Risk of Bias

Five studies were judged to have low overall risk of bias, six had some concerns or moderate risk, and four had high or serious risk. Common problems included unclear allocation concealment, lack of blinded outcome assessment, small samples, incomplete reporting of attrition, use of unvalidated scales, reliance on self-report, baseline differences, failure to account for clustering, and selective reporting.

Blinding students to educational interventions was not feasible. Nevertheless, several studies reduced measurement bias by using blinded OSCE examiners, standardized scenarios, or trained external raters.

Table 2. Direction of effect across patient-centered outcome domains

Outcome domain	Studies assessing	Studies improved	Interpretation

Global patient-centered communication	13	11	Consistent short-term benefit
Patient agenda and illness-experience exploration	7	6	Strong benefit when explicitly taught
Empathy and emotional responsiveness	11	8	Generally positive but instrument-dependent
Plain language and health-literacy communication	7	6	Positive, particularly with simulation
Shared decision-making or informed consent	6	5	Promising but assessed in relatively few studies
Difficult-news communication	5	4	Positive for structured and simulation-based programs
Patient-rated rapport or satisfaction	5	4	Favourable but less consistent than observer ratings
Retention beyond immediate assessment	6	3	Evidence limited and inconsistent

Table 3. Summary of methodological quality

Overall judgment	Studies	Main considerations
Low risk	5	Adequate randomization, standardized assessment, blinded or independent raters, and limited missing data
Some concerns/moderate risk	6	Minor weaknesses in allocation, incomplete blinding, attrition, or outcome validation
High/serious risk	4	Non-randomized allocation, important baseline imbalance, self-report dominance, or selective reporting

Certainty of Evidence

Certainty was considered moderate for short-term improvement in objectively assessed patient-centered communication and patient agenda exploration; low to moderate for empathy and emotional responsiveness; low for health-literacy communication, shared decision-making, and patient-rated outcomes; and very low for long-term retention and transfer to routine clinical care. Certainty was reduced by intervention heterogeneity, small samples, differences in assessment instruments, short follow-up, and limited real-patient data.

DISCUSSION

Principal Findings

Communication skills education generally improved patient-centered outcomes among medical students. Benefits were observed across global consultation performance, patient agenda elicitation, emotional responsiveness, understandable explanation, shared decision-making, informed consent, and delivery of difficult information.

The results support communication as a performance-based clinical competency rather than a purely attitudinal outcome. Improvements were most consistent when students conducted a consultation, responded to patient cues, and received feedback on observable behaviours. Patient-centered communication was also clearly multidimensional: students could establish rapport yet fail to check understanding, or provide an organized explanation while omitting patient preferences.

Active Learning as the Central Educational Mechanism

Active learning distinguished effective interventions from less successful approaches. Simulation, role-play, standardized patients, patient volunteers, and improvisation required students to respond in real time while integrating listening, clinical reasoning, emotional regulation, verbal communication, and non-verbal behaviour.

Passive knowledge does not guarantee performance. Students may know that open questions are recommended but still interrupt a patient under examination pressure. Repeated practice helps learners convert principles into usable behaviours and exposes discrepancies between intended and actual performance.

Feedback and Guided Reflection
Feedback was a major component of successful programs. Faculty commonly addressed structure, information gathering, and clinical completeness; standardized patients emphasized how the interaction felt; patients highlighted whether they felt heard and respected; and digital platforms revealed non-verbal behaviours that students might not otherwise recognize.

Feedback should be specific, timely, behaviour-focused, and linked to another opportunity for performance. Without repetition, students may understand what should change but have no structured opportunity to test an alternative approach.

Empathy Education
Empathy was frequently evaluated, but measurement remained inconsistent. Self-report scales captured perceptions and attitudes, whereas observer and patient ratings assessed expressed behaviour. The included evidence suggests that empathy is most effectively taught by helping students recognize emotional cues and formulate an appropriate response.

Useful behaviours include allowing the patient to complete an emotional statement, naming or acknowledging emotion, validating the response, exploring the concern, avoiding premature reassurance, using silence appropriately, and offering support. Empathy should be reinforced longitudinally because short interventions may produce only temporary change.

Health Literacy and Understandable Explanations
Patient-centered communication requires information to be accurate, understandable, and usable. Medical vocabulary becomes familiar during training, increasing the risk that students use jargon without recognizing it. Health-literacy education teaches learners to organize information, use plain language, prioritize key messages, check comprehension, and support self-management.

Teach-back is particularly valuable because it assesses the clarity of the clinician's explanation rather than testing the patient. Health-literacy communication should be integrated into history taking, prescribing, discharge advice, informed consent, and chronic-disease counselling.

Shared Decision-Making and Informed Consent
Students commonly learn to provide recommendations but receive less training in presenting alternatives, discussing uncertainty, and asking how patients wish to participate. This can produce consultations that are informative but remain clinician-directed.

Informed-consent simulation provides a useful setting for teaching autonomy. It requires students to explain the procedure, alternatives, benefits, risks, and option of declining treatment while assessing understanding and voluntariness. Modelling, peer reenactment, feedback, and structured assessment can improve these behaviours.

Teaching Difficult Conversations
Difficult-news communication highlights the limitations of checklist-only teaching. Frameworks can help organize the encounter, but effective delivery also requires sensitivity to timing, emotion, uncertainty, and patient preferences. Patient narratives allow students to hear what patients found helpful or harmful, whereas carefully designed negative examples help learners discriminate between effective and ineffective communication.

Teaching should address preparation, disclosure, silence, emotional response, questions, uncertainty, support, and follow-up rather than focusing only on the moment of disclosure.

Role of Technology
Technology can increase access to communication practice but should support rather than replace human interaction. Automated feedback can draw attention to gaze, posture, facial expression, and conversational balance, while virtual patients provide standardized exposure to complex scenarios.

The strongest technology-supported interventions combined digital preparation or feedback with an observed consultation, facilitated reflection, or repeat practice. Information-only modules were less likely to change interpersonal behaviour.

Curriculum Implications
Communication education should be longitudinal and developmentally sequenced. Early training should introduce listening, open questions, non-verbal communication, patient agenda elicitation, empathy, plain language, and consultation structure. Later teaching should address shared decision-making, informed consent, uncertainty, health behaviour change, cultural and linguistic differences, conflict, medical error, serious illness, treatment refusal, and end-of-life communication. Communication should be integrated with clinical disciplines rather than isolated within professionalism teaching. Physiology and other foundational sciences can contribute by connecting mechanisms of stress, emotion, pain, autonomic responses, and cognition with the lived experience of patients and with communication during clinical assessment.

Assessment Implications
Assessment strongly influences learner priorities. When examinations reward only completeness of biomedical history, students may treat patient-centered behaviours as optional. Communication assessment should evaluate relationship establishment, patient agenda, emotional responsiveness, information organization, plain language, checking comprehension, collaborative planning, and non-verbal behaviour.

Multiple encounters and multisource assessment are needed because performance varies across scenarios. Faculty, standardized patients, peers, real patients, and learners themselves notice different aspects of the consultation.

Transfer to Real Patient Care
A major limitation of the evidence was the emphasis on simulated outcomes. OSCEs provide standardization and permit blinded assessment, but students know they are being observed. Clinical settings involve time constraints, interruptions, diagnostic uncertainty, workload, and variable supervision.

Few studies examined actual patient satisfaction or communication during routine care. Future research should include workplace-based observation, patient-reported experience measures, and follow-up into internship or early postgraduate training.

Research Priorities
Future studies should prospectively register protocols, use adequately powered multicentre designs, report randomization and allocation clearly, use validated instruments, include blinded performance assessors, distinguish self-reported confidence from observed competence, and report intervention fidelity.

Research should also assess retention for at least six to twelve months, evaluate transfer across clinical specialties, include patient-reported outcomes, examine cultural and linguistic adaptation, report cost and scalability, involve patients in curriculum development, and publish neutral or negative findings. A core outcome set would improve comparability across studies.

Strengths
This review focused specifically on patient-centered outcomes rather than treating all communication measures as equivalent. It included empathy, patient agenda, health literacy, shared decision-making, informed consent, difficult-news delivery, rapport, and patient satisfaction. The synthesis also examined educational mechanisms, including active practice, feedback, reflection, patient participation, and technology-supported assessment.

Limitations
The interventions differed substantially in duration, format, clinical context, and intended competency, preventing meaningful statistical pooling. Definitions and instruments also varied, with some emphasizing consultation structure and others focusing on empathy, health literacy, or satisfaction.

Several studies were conducted at single institutions, limiting generalizability. Students and teachers could not be blinded, follow-up was generally short, and patient-reported outcomes were underrepresented. Standardized-patient examinations may overestimate performance in busy clinical environments, and publication bias cannot be excluded.

The search may have missed studies described using broader terms such as professionalism, clinical interviewing, relational practice, or consultation competence. In addition, the review was not prospectively registered, which may have increased the possibility of protocol deviations or selective methodological decisions.

CONCLUSION
Communication skills education improves multiple patient-centered outcomes among undergraduate medical students. The clearest benefits occur when students participate in realistic clinical encounters, respond to patient cues, receive specific feedback, and repeat the consultation.

Effective education should address distinct competencies such as patient agenda elicitation, empathy, plain-language explanation, shared decision-making, informed consent, and difficult-news communication. Simulation, standardized patients, patient narratives, guided reflection, improvisation, and digital feedback can all contribute when incorporated into an integrated educational design.

Medical schools should provide longitudinal communication education throughout undergraduate training and align assessment with patient-centered behaviours. Future studies should determine whether educational improvement is retained and transferred to routine care, where it can influence patient understanding, trust, participation, and experience.

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